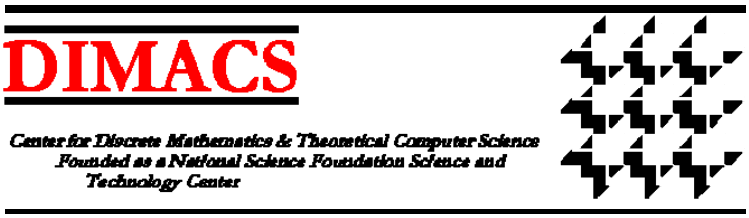
Center for Discrete Mathematics and Theoretical Computer Science (DIMACS)



ANNUAL REPORT

December 2006

Fred S. Roberts, Director
CoRE Building/4th Floor
Rutgers University
96 Frelinghuysen Road
Piscataway, NJ 08854-8018
Telephone: (732) 445-4303
E-Mail: froberts@dimacs.rutgers.edu

Executive Summary

The Center for Discrete Mathematics and Theoretical Computer Science (DIMACS) was founded in 1988 with a prestigious NSF Science and Technology Center (STC) award to foster research and educational programs in areas at the interface of Discrete Mathematics (DM) and Theoretical Computer Science (TCS). DIMACS began as a partnership of four New Jersey institutions – Rutgers, Princeton, AT&T Bell Labs, and Bellcore – each with strong research groups in these fields. As DIMACS has grown and matured it has broadened both academically and geographically, with added partners and a far-reaching research program. Its partners now include Rutgers, Princeton, AT&T Labs, Lucent/Bell Labs, Telcordia Technologies (Bellcore) and NEC Laboratories America, with affiliates at Avaya Labs, IBM Research, Microsoft Research, HP Labs, Stevens Institute, Georgia Tech, and RPI.

DIMACS has become a national resource in computer science (CS), mathematics and their applications, with an ever-broader scope, involving a large number of people from around the world in research and educational activities. There is no comparable computer science/mathematics center in the United States. DIMACS aims to: promote research in areas that are poised for rapid development, with the potential for high impact; promote applications of methods and results from CS and closely-related mathematics and statistics in other areas of science and in industry; encourage and facilitate the efforts of computer and mathematical scientists to draw research inspiration from other areas of science and from industry; inform the broader mathematical sciences community about important research in CS and mathematics and their applications; and promote and facilitate incorporating contemporary research ideas, techniques, and applications into classrooms at all levels.

Since its founding, DIMACS has had over 25,000 visitors. There are over 296 scientists who are "permanent members", many among the world's leaders in DM/TCS and other fields. In a typical year, the Center runs some 30 workshops with 1,500 attendees, including 50 2- and 4-year college faculty, 100 precollege teachers, and 100 high school students, as well as numerous graduate and undergraduate students. DIMACS typically hosts 60 visiting scientists and 4 postdoctoral fellows annually. The Center is truly a resource for a large and dynamic community and, through its many collaborations with individual faculty, departments and centers, is a nexus of activity at Rutgers.

As DIMACS has evolved, it has broadened its scope in the mathematical sciences as well as forged new connections between DM/TCS and other areas of science. Applications of DM/TCS to problems in biology, engineering, homeland security and the physical and social sciences add to the more traditional DIMACS applications in CS and telecommunications. Mathematical science methods as diverse as computational statistics, differential equations, stochastic processes, and algebraic geometry have been applied to a variety of practical problems and explored for their own sake. In addition, the Center's CS scope has changed and broadened dramatically. Problems from numerous areas of CS, in addition to foundations, have led DIMACS in new directions such as information and data management, machine learning, and trusted computing. Investigation of emerging research trends in areas such as privacy, security, and sensors have opened up new dimensions for DIMACS and for CS as a discipline. DIMACS has become known for synergizing collaborations between researchers in different disciplines, often leading to major advances and sometimes startling insights.

While its breadth of activity makes DIMACS research difficult to categorize, a simplified view suggests three major thrusts: DM/TCS and their applications; homeland security broadly defined; and computational biology/bio-math/mathematical and computational epidemiology. The Center's stature in DM/TCS places it among the world's leading centers of activity in this field. In homeland security, DIMACS stature was recognized by the Department of Homeland Security awarding Rutgers/DIMACS a university-affiliate center, indeed the role of "coordinating" center in a new group of centers nationwide. In Bio-Math, we played an important role in establishing the field of computational biology and an international leadership role in computational/mathematical epidemiology.

Educational programs are intertwined with almost everything DIMACS does. DIMACS is justifiably renowned for its pioneering programs, ranging from K-12 student and teacher programs to programs for undergraduate students and faculty to programs for graduate students and postdoctoral fellows. DIMACS stature at the interface between research and education was recognized by the recent receipt of a major $2.55M NSF award (funded by the NSF directorates EHR, CISE, and MPS) to bring the bio-math interface into the high schools. DIMACS has also pioneered in international Research Experiences for Undergraduates (REU) programs and in programs to "Reconnect" 2- and 4-year college faculty to research. Its postdoctoral fellows have gone on to positions of leadership in numerous fields throughout the world. The participants in DIMACS educational programs routinely tell us about the impact of these programs on their careers and their lives. We are especially proud of having "changed the culture" in many ways, getting high-powered researchers involved with educational programs at all levels and instilling in our students and postdoctoral fellows an abiding commitment to education.

The primary scientific activity at DIMACS is a "special focus" (SF), a coordinated collection of activities such as workshops, working groups, and tutorials, together with visitors, postdocs, and students conducting research in the SF theme. Each SF concentrates on an area poised for rapid advancement, with high potential for impact in other areas of science or industry, and likely to spawn new activities and collaborations. In early years, DIMACS emphasized SF topics close to DM/TCS, such as Discrete and Computational Geometry, Complexity Theory of Interactive Computing, and Graph Theory and Algorithms. The SFs became broader in scope, more complex, and longer in duration beginning with the 1994 "special year" on Mathematical Support for Molecular Biology (that lasted until 2000). When its STC award ended in 2000, the Center redefined itself and broadened its scope. SF programs were initiated in Computational Molecular Biology, Next Generation Networks Technologies, Data Analysis and Mining, and Computational Information Theory and Coding. In recent years, the themes have become even broader and more wide-ranging. Current SF programs are: Computational and Mathematical Epidemiology, Communication Security and Information Privacy, Computation and the Socio-Economic Sciences, Information Processing in Biology, and Discrete Random Systems, with a new focus on Algorithmic Foundations of the Internet in planning.

DIMACS SF programs have led to major scientific breakthroughs, stimulated new directions of research, and forged lasting new partnerships among diverse scientific communities. The results are often unexpected and have been obtained by bringing together outstanding scientists, involving first-rate junior people, running a focused series of workshops and working group meetings, and providing opportunities for intensive interaction, often among people from different fields of the mathematical and computational sciences or from different disciplines. Outside evaluations give high praise to the SFs, trace their dramatic impact on the development of a field, on the creation of new partnerships and collaborations, and on the careers of those involved, and include many citations of papers directly traceable to the special focus, many of them seminal.

DIMACS is the home for many large, complex research projects involving scientists from various backgrounds and institutions. They often result from SF activities and, in turn, stimulate new ones. Current research projects include: Extremal Combinatorics, Graph Coloring, and Algebraic Methods in Combinatorics; Port of Entry Inspection; Monitoring Message Streams; Author Identification; Analysis of Blog Multi-Graph Streams; Bioterrorism Sensor Location; and DNA and the Barcode of Life.

Since the NSF STC award ended in January 2000, we have reinvented DIMACS. The initiatives launched in recent years are bearing fruit (with over $6.4M in recent grants), and the Center continues to be a resource for both Rutgers and our larger community. However, the effort to redefine DIMACS has not been an easy one. Without a large center grant, management spends substantial time raising funds. The sheer variety of funding sources, the time required to make so many grant applications and the subsequent reporting requirements are daunting. In spite of these challenges, DIMACS is thriving. Those who are involved with it give consistent praise to the opportunities DIMACS provides, and we continue to get positive feedback from our local, national and international constituencies.

Table of Contents

1. Introduction

The Center for Discrete Mathematics and Theoretical Computer Science (DIMACS) was founded in 1988 with a prestigious NSF Science and Technology Center (STC) award to foster research and educational programs in areas at the interface of Discrete Mathematics (DM) and Theoretical Computer Science (TCS). The Center was one of 11 National Science Foundation (NSF) STCs, funded by a 5 year $10M grant under a program recommended by the White House and the National Academy of Sciences to increase the nation's economic competitiveness. STC support continued through the planned 11-year lifetime of the STC award, with additional support from the NJ Commission on Science and Technology. DIMACS began as a partnership of four NJ institutions – Rutgers, Princeton, AT&T Bell Labs, and Bellcore – each with strong research groups in DM/TCS. As DIMACS has grown and matured it has broadened both academically and geographically, with added partners and a far-reaching program of research and education. Its partners now include Rutgers, Princeton, AT&T Labs, Lucent/Bell Labs, Telcordia Technologies (formerly Bellcore) and NEC Laboratories America, with affiliates at Avaya Labs, IBM Research, Microsoft Research, HP Labs, Stevens Institute, Georgia Tech, and RPI.

DM is concerned with arrangements, designs, codes, best patterns, optimal schedules and efficient assignments, while TCS is concerned with the theory of computer algorithms. Together, DM and TCS form powerful tools for solving important problems of science, industry and government. As DIMACS has evolved, it has broadened its scope in the mathematical sciences as well as forged new connections between DM/TCS and other areas of science. Applications of DM/TCS to problems in biology, engineering, homeland security and the physical and social sciences add to the more traditional DIMACS applications in computer science (CS) and telecommunications. Mathematical sciences methods as diverse as computational statistics, ordinary and partial differential equations, stochastic processes, and algebraic geometry have been applied to a variety of practical problems and explored for their own sake. In addition, the Center's CS scope has changed and broadened dramatically. Problems from numerous areas of CS, in addition to foundations, have led DIMACS in new directions such as information and data management, machine learning, and trusted computing. Investigation of emerging research trends in areas such as privacy, security, and sensors have opened up new dimensions for DIMACS and for CS as a discipline. DIMACS has become known for stimulating collaborations between researchers in different disciplines, often leading to major advances and sometimes startling insights.

While its breadth of activity makes DIMACS research difficult to categorize, a simplified view suggests three major thrusts: DM/TCS and their applications; homeland security broadly defined; and computational biology/bio-math/mathematical epidemiology. In spite of the losses in the DIMACS community due to the demise of telecom, it is safe to say that the Center's stature in DM/TCS places it among the world's leading centers of activity in this field. In homeland security, DIMACS was recently recognized by the Department of Homeland Security (DHS) awarding Rutgers/DIMACS a university-affiliate center, indeed the role of "coordinating" center in a new group of centers nationwide. In Bio-Math, we played an important role in establishing the field of computational biology and an international leadership role in computational/mathematical and computational epidemiology.

Educational programs are intertwined with almost everything DIMACS does. DIMACS is justifiably renowned for its pioneering programs integrating research and education, ranging from K-12 student and teacher programs to programs for undergraduate students and faculty to programs for graduate students and postdoctoral fellows. DIMACS stature at the interface between research and education was recognized by the recent receipt of a major $2.55M NSF award (funded by the NSF directorates EHR, CISE, and MPS) to bring the bio-math interface into the high schools. DIMACS has also pioneered in international Research Experiences for Undergraduates (REU) programs and in programs to "Reconnect" 2- and 4-year college faculty to research. Its postdoctoral fellows have gone on to positions of leadership

in numerous fields throughout the world. The participants in DIMACS educational programs routinely tell us about the impact of these programs on their careers and their lives.

Since its founding, DIMACS has had over 25,000 visitors. (See Appendix 6.10 for visitors in the past few years.) Many of them came for DIMACS workshops or tutorials or to participate in small, informal research groups we call "working groups." Others came to visit for a period lasting from a few days to a year or more, interacting with other visitors, postdoctoral fellows, and some of the 296 scientists who are "permanent members" of DIMACS. The Center typically hosts 60 visiting scientists and 4 postdoctoral fellows annually. In a typical year, it runs some 30 workshops with 1,500 attendees, including 50 2- and 4-year college faculty, 100 precollege teachers, and 100 high school students, as well as numerous graduate and undergraduate students. To date, DIMACS has published 71 volumes in its book series, 1028 technical reports, and 10 educational modules. The Center is truly a resource for a large and dynamic community and is a nexus of activity at Rutgers.

DIMACS has become a national resource in CS, mathematics and their applications, with an ever-broader scope, drawing people from around the world into research and educational activities. There is no comparable computer science/mathematics center in the United States. DIMACS aims to: promote research in areas that are poised for rapid development, with the potential for high impact; promote applying methods and results from CS and closely-related mathematical sciences in other areas of science and in industry; encourage and facilitate the efforts of computer and mathematical scientists to draw research inspiration from other areas of science and from industry; inform the broader mathematical sciences community about important research in CS and mathematics and their applications; and promote and facilitate incorporating contemporary research ideas, techniques, and applications into classrooms at all levels.

2. Resources

2.1 Facilities:

Space, Workshop Facilities, and Staff: DIMACS is renowned for high quality workshops. The success of these workshops owes much to DIMACS physical facilities in the CoRE Building on the Rutgers Busch Campus in Piscataway, New Jersey. This space comprises the entire fourth floor of the building and amounts to 9,434 square feet, including 26 offices (a large percentage available to visitors, postdocs and students), a 70-seat seminar room, smaller breakout rooms, a lounge where we can hold common workshop meals and combine them with research discussions, kitchen, conference room, two PC labs, and a mailroom. The CoRE Building also has a 110-seat auditorium that is shared by the building's occupants and is available for DIMACS workshops. The DIMACS staff is experienced in all aspects of workshop organization, including publicity, local arrangements, technical support, and financial reimbursements, making it possible for the workshop organizer to concentrate on the scientific program.

DIMACS Computing Resources: DIMACS computer equipment includes a central cluster of 1 Sun Enterprise 450 server and 3 Sun SPARC servers with over 74GB of storage capacity and 2GB of total RAM; 4 Windows servers with 210GB of storage and 400MB of RAM; and 2 PC Labs with a total of 15 PCs. There are an additional 8 Sun workstations 52 PCs and 4 Apple Macintoshes used by staff, postdocs, visitors and workshop participants, as well as 8 tablet PCs and several laptops for portable computing needs. The CoRE building also has wireless computing capabilities.

2.2 Faculty/Staff:

DIMACS has some 296 ***permanent members***, most from its partner institutions. They include some of the

world's leaders in DM, TCS and other relevant research areas. Of these, 82 are from Rutgers, most from the four formal DIMACS units at Rutgers, CS (15), Math (26), Statistics (12), and OR (RUTCOR) (12). A list of DIMACS permanent members and their research interests is given in Appendix 6.5. Appendix 6.9 gives a selection of honors and awards.

Only four of these members have their salary paid by DIMACS: The Director, Fred Roberts, and Associate Directors Tamra Carpenter, Melvin Janowitz, and Brenda Latka. Roberts has tenure in the Math Department. Carpenter, Janowitz, and Latka are non tenure-track faculty appointments. Rutgers made a commitment to hire a tenured Deputy Director who will eventually become Director. We are delighted that Rebecca Wright has accepted this position.

At any given time, many permanent members at Rutgers are involved in DIMACS activities, as part of a research project, as an organizer of a workshop program, as a member of a Center committee, as a graduate or undergraduate student mentor, etc. Examples are given in Appendices 6.4 and 6.7.

An ***Executive Committee*** (EC) meets monthly to set general policy for the Center, make decisions about programs, members and units, and advise the Director. Members of the EC are DIMACS Director and Associate Directors; Associate Director for Education Joe Rosenstein (RU-Math); a representative from each Rutgers unit, Peter Hammer (RUTCOR), Joe Kilian (CS), Regina Liu (Statistics), and Mike Saks (Math); and industrial and academic partner representatives: Robert Tarjan (Co-Director – Princeton), Sandeep Bhatt (HP Labs), Jennifer Chayes (Microsoft Research), Dennis Egan (Telcordia Technologies), Steve Fortune (Bell Labs), Mark Goldberg (RPI), Sean Hallgren (NEC Laboratories America), David Johnson (AT&T Labs), Jim Landwehr (Avaya), Dana Randall (Georgia Tech), Baruch Schieber (IBM Research), and Rebecca Wright (Stevens). The DIMACS *Council*, a larger body of Center leaders, meets once a semester.

An Advisory Board meets annually to discuss the overall direction of the Center. A list of Advisory Board members is given in Appendix 6.12.

2.3 Funding Model:

Almost all DIMACS projects are funded by grants and contracts. Its operating expenses depend on the following components:

Grants: Grant support for projects is up significantly, and also grant support for operating expenses, with the highlight for the latter being a highly unusual infrastructure award from NSF in 2005.

Indirect Cost Return from Rutgers: Rutgers provides DIMACS with 40 to 50% return on indirect costs on grants. Since many of the grants are primarily for participant support, indirect costs can sometimes be relatively minimal.

Corporate Member Fees: With the downturn in telecom and IT, corporate member payments have dropped. They were never large. The active involvement of professional staff has always been the key component of corporate involvement with DIMACS, and this continues at a very healthy level.

Registration Fees at Workshops: A portion of registration fees at workshops goes to cover common meals, breaks, and a social event. Most of the remainder is designated for support of infrastructure, including workshop supplies and staff. This has become an important source of revenue for DIMACS.

Salary Savings: Every dollar of salary that DIMACS raises for its director is returned to the Center by Rutgers for use in support of operating expenses. This is what we refer to as "salary savings."

Rutgers Direct Support: Rutgers' support for the infrastructure includes pay for part of a staff member. DIMACS regularly succeeds in Rutgers internal competitions for computer equipment support. Rutgers also pays the salary of the director and pays for space, heat, light, etc. (Some research centers at Rutgers are charged for these things.) Rutgers has also given DIMACS a number of awards in the university "Academic Excellence" program, leading to both programmatic and staff support for the Bio-Math in the Schools program and a Lab for Port Security. Rutgers has also supported part of a joint DIMACS-Institute for Advanced Study postdoctoral fellow.

Revenues and Expenses

	Actual 05/06	Projected 06/07
DIMACS Revenue Sources:	3,266,474	4,513,288
Projected 06/07 Operating Costs:		836,962

DIMACS has several substantial new awards that allow us to project continued activity at least at the present levels. The total amount we have received in new grants in the past year is $6,466,137. Details of revenues, operating expenses, and grants are given in Appendices 6.1 and 6.2.

The major source of support for DIMACS continues to be NSF, with support from numerous directorates: Computer and Information Sciences and Engineering, Mathematical and Physical Sciences, Social and Behavioral Sciences, Biological Sciences, Education and Human Resources, and International programs. This diversity is important to the health of the center and reflects its diverse expertise and reputation. We continue to go to many agencies and institutions for funds. New funding sources are increasingly important, especially project support from the intelligence community and the new DHS center grant. Foundation grants do not play as significant a role as in the past, when DIMACS received considerable support from the Sloan Foundation and the AT&T Foundation.

2.4 Industry Program:

DIMACS industrial partners are key players in the Center. Researchers from these partners sit on the DIMACS Executive Committee, which meets monthly, and they are actively involved in other DIMACS committees, research programs, workshops, and educational programs.

We have two types of industrial lab affiliation that differ largely in the target financial support for the Center and the amount of partner involvement in DIMACS decision making. For affiliate partners, the target support is $10K per year, with $5K a minimum, while for full partnership the target support is $40K per year. We are very flexible about this, in particular about the dollar amounts and how the support comes. The affiliation and involvement are more important to us than the money. In recent years, it has not been uncommon for our corporate partners to miss their payment targets or omit payment entirely in a given year. On the other hand, we sometimes get more than the target amount if a partner has leftover money or has a particular shared project in mind. For instance, we received $50K from IBM Research this year for a workshop. Current full partners are AT&T Labs, Bell Labs, NEC Laboratories America, and Telcordia Technologies, with affiliates at Avaya Labs, HP Labs, IBM Research, and Microsoft Research.

There are various other ways in which we interact with companies. Some of our corporate partners are actually subcontractors on our grants. This has been the case recently with IBM, Telcordia, Bell Labs, and AT&T Labs. The latter two partners are major players in the new DHS Center award.

Sharing postdocs is another way in which we interact with our industrial partners. We have shared postdocs with AT&T Labs, Telcordia, Bell Labs, and NEC Research, and we now have an NSF grant for a joint DIMACS-Bell Labs postdoc, with Bell Labs paying its share and NSF paying the DIMACS share.

We regularly reach out to other companies. In particular, researchers from the pharmaceutical companies have been active in our computational biology and epidemiology activities, both as organizers and participants. Merck Research is an active partner in this sense. The pharmaceuticals sometimes contribute funds for workshops. Our colleagues at Merck have been pushing to put us into their regular budget. Researchers from other companies such as ExxonMobil Research, Yahoo!, Google, RSA Labs, SRI International, etc. have also taken on organizational roles at DIMACS and we have obtained small workshop-support contributions from some of these companies as well.

To show the involvement of industrial researchers in DIMACS activities, we list in Appendix 6.7 the industrial researchers currently on DIMACS committees, those who have organized a workshop or served on an organizing committee for a "special focus" program in the last two years, and those who are involved in one of the active research projects at the Center.

2.5 Collaborations:

DIMACS collaborations are key to its success and take many forms.

a. Rutgers

DIMACS has ongoing collaborations with faculty from a wide range of departments, centers, and disciplines at Rutgers. The following are examples of the diversity of DIMACS partnerships at Rutgers.

- The Departments of Mathematics, Computer Science, and Statistics and Rutgers Center for Operations Research (RUTCOR) are formal DIMACS partners and are involved in every aspect of DIMACS research and education programs.
- Rutgers University Homeland Security Research Initiative (RUHSRI) coordinates Rutgers homeland security research. DIMACS has several RUHSRI members and the DIMACS Director was instrumental in organizing this initiative and is its current Chair.
- The Rutgers Center for Mathematics, Science, and Computer Education (CMSCE) is a key partner in our K-12 educational programs.
- The Graduate School of Education faculty is involved with DIMACS K-12 programs, including the ones we will be developing through our new DHS center.
- The BioMaPS Institute for Quantitative Biology is a partner in our special focus on Information Processing in Biology and in several joint tutorial programs.
- The Center for Advanced Infrastructure and Transportation (CAIT) is a partner in the Laboratory for Port Security.
- The Wireless Information Network Laboratory (WINLAB) faculty members have organized DIMACS workshops and work with DIMACS through RUHSRI.
- The Center for Computational Biomedicine, Imaging and Modeling (CBIM) faculty are involved with DIMACS through both RUHSRI and our DHS center.
- The School of Communications, Information, and Library Studies (SCILS) faculty are involved in several DIMACS and new DHS center research projects and in the REU program.
- The Center for Advanced Information Processing (CAIP) faculty are involved in several DIMACS and new DHS center research projects and with RUHSRI.

b. University Affiliates

DIMACS has university partners, in addition to the industry partners, described in Section 2.4. Rutgers and Princeton are DIMACS founding partners, while Stevens Institute of Technology, Rensselaer

Polytechnic Institute (RPI) and Georgia Tech are more recent affiliate partners. RPI is a subcontractor in the new DHS center and Georgia Tech is subcontractor on our NSF grant for the special focus on Discrete Random Systems.

c. The Homeland Security Center for Dynamic Data Analysis (DyDAn)
The new homeland security center, DyDAn, is one of four University Affiliate Centers of the Institute for Discrete Sciences, which is a joint project between the Department of Homeland Security and several National Laboratories, led by Lawrence Livermore National Laboratory. DyDAn is led by DIMACS and is a collaboration of five university partners and two industry partners. In addition to Rutgers, the DyDAn partner institutions are: Princeton University, RPI, Texas Southern University, Texas State University San Marcos, AT&T Labs, and Bell Labs/Lucent Technologies. DyDAn will coordinate a team of four new university centers. The other three are based at University of Illinois, University of Pittsburgh, and University of Southern California.

d. The Institute for Advanced Study (IAS), Princeton
DIMACS has had a close relationship with IAS since the founding of our Center. We have a 2-year postdoc each year (one year at DIMACS, one at IAS.) We have co-sponsored several special focus programs, held joint workshops, and collaborated on a major joint research/education program, the DIMACS Research and Education Institute (DREI), where DIMACS was an IAS subcontractor.

e. Minority Institutions
DIMACS partners with minority institutions on projects that include workshops on mathematical modeling of the spread of infectious diseases in Africa and a related Advanced Study Institute, programs integrating research and education such as our "Reconnect" program, and homeland security research, with Texas Southern University a formal DyDAn partner. DIMACS collaborators include:

- Cal State Dominguez Hills
- Clark Atlanta University
- Howard University
- Morgan State University
- North Carolina A&T University
- Spelman College
- Texas Southern University
- University of Houston Downtown
- University of North Carolina Pembroke

f. The New Jersey Universities Homeland Security Research Consortium
The Consortium was founded to coordinate homeland security research among faculty at New Jersey's universities and to facilitate collaboration among university faculty and between university faculty and New Jersey government officials. The DIMACS director co-chairs the Consortium, which is a collaboration of seven New Jersey universities: Fairleigh Dickinson University, Monmouth University, New Jersey Institute of Technology (NJIT), Princeton University, Rutgers University, Stevens Institute of Technology and the University of Medicine and Dentistry of New Jersey (UMDNJ). The Consortium is recognized by and works with the Office of the NJ Attorney General and NJ Office of Homeland Security and Preparedness as well as numerous government and military research units in the State.

g. International Partners
DIMACS has funding for several ongoing international collaborations, including those with:

- DIMATIA, the Center for Discrete Mathematics, Theoretical Informatics, and Applications, at Charles University in Prague, Czech Republic
- The Alfred Rényi Institute of Mathematics of the Hungarian Academy of Sciences in Budapest.

- LAMSADE (Laboratoire d'Analyse et Modélisation de Systèmes pour l'Aide à la Décision) (Laboratory for Analyzing and Modeling Decision-Aid Systems), University of Paris-Dauphine.
- SACEMA (South African Department of Science and Technology/National Research Foundation Centre of Excellence in Epidemiological Modeling and Analysis)
- AIMS (African Institute for Mathematical Sciences)

DIMACS partners with DIMATIA and the Rényi Institute in a collaboration that involves multinational "working groups" in research areas of discrete mathematics and theoretical computer science where the three centers have major strengths. DIMACS and DIMATIA partner in a pioneering international REU program, described in Section 4.1.

DIMACS has joined with LAMSADE in a collaborative project on computer science and decision theory that includes two workshops in Paris and includes the exchange of graduate students for extended visits.

DIMACS is collaborating with South African centers SACEMA and AIMS on two workshops and an advanced study institute in South Africa to study mathematical modeling of the spread of infectious diseases in Africa.

Other recent international partners have included universities and research centers in Taiwan, Korea, Hong Kong, Israel, Denmark, and elsewhere.

h. Miscellaneous

DIMACS has worked with:

- Los Alamos National Laboratory and with the US Coast Guard on its Port Security Research
- COMAP (Consortium for Mathematics and its Applications) and the Colorado State University to develop an innovative mix of instructional materials for connecting the mathematical and biological sciences in the high schools
- NISS (National Institute of Statistical Sciences) and SAMSI (Statistical and Applied Mathematical Sciences Institute) to plan joint workshop(s) and a future SF on Experimental Analysis of Algorithms, a theme at the interface of computing and statistics
- CDC (Centers for Disease Control and Prevention) on syndromic surveillance activities
- UMDNJ faculty on the Port of Entry Inspection and Bioterrorism Sensor Location projects. DIMACS is also a subcontractor to a UMDNJ/ EOHSI (Environmental and Occupational Health and Sciences Institute) grant from the US Environmental Protection Agency. UMDNJ faculty have also been involved in organizing our Special Focus on Computational and Mathematical Epidemiology.

DIMACS is heavily involved with agencies in the State of New Jersey. The DIMACS Director serves on the Governor's NJ Regional Homeland Security Technology Council, the Advisory Committee for NJ's CBRNE Center, the Domestic Security Preparedness Task Force Planning Group of the Office of Homeland Security and Preparedness, and DIMACS faculty interact with these agencies and with the Departments of Health, Transportation, etc.

3. Research Program

3.1 Research Scope and Strategy:

The primary scientific activity at DIMACS is a "special focus" (SF), a coordinated collection of activities such as workshops, working groups, and tutorials, together with visitors, postdocs, and students conducting research in the SF theme. Each SF concentrates on an area poised for rapid advancement, with high potential for impact in other areas of science or industry, and likely to spawn new activities and

collaborations. In early years, DIMACS emphasized SF topics close to DM/TCS, such as Discrete and Computational Geometry, Complexity Theory of Interactive Computing, and Graph Theory and Algorithms. The SFs became broader in scope, more complex, and longer in duration beginning with the 1994 "special year" on Mathematical Support for Molecular Biology (that lasted until 2000). When its STC award ended in 2000, the Center redefined itself and broadened its scope. SF programs were initiated in Computational Molecular Biology, Next Generation Networks Technologies, Data Analysis and Mining, and Computational Information Theory and Coding. In recent years, the themes have become even broader and more wide-ranging. Current SF programs are: Computational and Mathematical Epidemiology, Communication Security and Information Privacy, Computation and the Socio-Economic Sciences, Information Processing in Biology, and Discrete Random Systems, with a new focus on Algorithmic Foundations of the Internet in planning. A list of all SF programs since DIMACS inception is included in Appendix 6.6. A calendar of workshops for current SF is given in Appendix 6.11.

DIMACS provides a home for large, complex research projects involving scientists from a variety of backgrounds and institutions. They often result from SF workshops and working group activities and in turn stimulate the development of new ones. Earlier projects of this sort included the LINK project, aimed at developing a software system for experimentation with and education in discrete mathematics. LINK was later adapted as the foundation for a system to aid the Internal Revenue Service in fraud detection. Another project of this sort involved simulating the global internet, which led to a parallel simulation package currently actively used on networking projects in over 40 corporations and universities. Current research projects include a project on Extremal Combinatorics, Graph Coloring, and Algebraic Methods in Combinatorics, one on Port of Entry Inspection Algorithms, and others on Monitoring Message Streams, Author Identification, Analysis of Dynamic Blog Multi-Graph Streams, Bioterrorism Sensor Location, and DNA and the Barcode of Life. They are described in Section 3.2.

Every one of DIMACS special years and SF programs has led to major scientific breakthroughs, stimulated new directions of research expected to continue for years to come, and forged lasting new partnerships among diverse scientific communities. The results are often unexpected and have been obtained by bringing together outstanding scientists, involving first-rate junior people, running a focused series of workshops and working group meetings, and providing opportunities for intensive interaction, often between individuals from different fields of the mathematical/computational sciences or from different disciplines. Outside evaluations give high praise to the SFs, trace their dramatic impact on the development of a field, on the creation of new partnerships and collaborations, and on the careers of those involved, and include many citations of papers directly traceable to the SF, many of them seminal. Details of some of these results are given in Appendix 6.8. Here is a brief summary.

Special Year on Discrete and Computational Geometry

- Proved the 22-year-old Gilbert-Pollak conjecture about the minimum ratio between the length of a Steiner minimum tree and a minimum spanning tree, important for communication networks.
- Solved the longstanding open problem of finding a linear-time algorithm for triangulating a simple polygon (without adding new vertices).
- Led to development of the first optimal deterministic convex hull algorithm.

Special Year on Complexity Theory of Interactive Computing

- Played a central role in two key developments in TCS: First, developed ways to verify correctness of computer "proofs."
- Second, discovered connections between interactive proofs and approximation algorithms.

Special Year on Graph Theory and Algorithms

- Solved at the time the "world's largest" unsolved Traveling Salesman Problem, arising from circuit board manufacturing.

Special Year on Mathematical Support for Molecular Biology
- Overturned a 40-year-old hypothesis in biology about ultraselfish genes in mice.
- Led to the discovery by biotech companies that their sequencing methods were not right.

Special Year on Logic and Algorithms
- Solved a problem of computer-aided verification (CAV) concerning the expressibility of temporal logic statements using ideas from finite model theory.
- Designed a new Ehrenfeucht-Fraisse game to capture the power of temporal logic.
- Led to proof that the decision problem for first-order logic with two variables is NEXPTIME-complete.

Special Year on Massively Parallel Computing/Discrete Event Simulation Projects
- Led to large, interdisciplinary research projects that developed the first model and simulation of the global Internet at massive scale, with software now used by over 40 companies and universities.

Special Year on Networks
- Developed an escrowed identity system to protect privacy in electronic toll collection.

Special Year on Large Scale Discrete Optimization
- Developed a new, remarkably simple on-line bin packing algorithm that performs optimally (in an average case sense) for all discrete distributions of item sizes.

Special Year on Discrete Probability
- Settled the long-open question of whether spontaneous symmetry-breaking is something that, if it occurs at all, occurs when the temperature drops below some unique critical point.

Special Focus on DNA Computing
- Designed a computer built from RNA to solve the chess problem of determining the positions knights can occupy on a chessboard such that no knight can attack any other knight.
- Led to the successful completion of the largest molecular computation in any lab to that time.

Special Focus on Data Analysis and Mining
- Proved a well-known conjecture in theoretical chemistry generated by the software system Graffiti that the "separator" of a fullerene is at most 1.
- Simplified the proof that the dodecahedron has the largest separator among all fullerenes.

Monitoring Message Streams Project
- Reduced memory usage of nearest neighbor (kNN) text classification by up to 10-fold, increased execution speed by up to 100-fold, and demonstrated scaling to tens of thousands of classes.
- Sped up application of tens of thousands of logistic regression classifiers, and used Laplace priors to reduce the size of these classifiers by 1000-fold while retaining state of the art effectiveness.
- Developed Bayesian Binary Regression (BBR) and Bayesian Multinomial Regression (BMR) packages, the most efficient software in the world for ultra-high dimensional logistic regression.

Special Focus on Computational and Mathematical Epidemiology

- Implemented and successfully tested a new ultra-high dimensional regression method for surveillance that has been shown to detect known signals of adverse events much faster than current widely-used methods such as GPS and RR.

3.2 Major Research Thrusts:

It is hard to divide DIMACS research into a few categories since there is such a variety. However, in this section, we have divided the research into three thrusts. There is a great deal of overlap among the thrusts, especially in terms of methodology.

Research Thrust 1: DM/TCS and their Applications
DIMACS original research area is DM and TCS and their Applications and this remains a major focus, though the areas of application have become broader.

Extremal Combinatorics/Graph Coloring Variants/Algebraic Methods in Combinatorics

This project is in collaboration with DIMACS international partners, the Rényi Institute in Budapest and the DIMATIA Center in Prague, with additional funding from the Czech and Hungarian governments. In extremal combinatorics, the research emphasizes extremal graph theory and extremal problems arising from combinatorial search and testing. Applications of graph theory have led to fascinating generalizations of the notion of graph coloring, with motivation coming from problems of channel assignment in communications, traffic phasing, fleet maintenance, task assignment, and other practical problems. The project is investigating such generalizations of graph coloring as T-colorings, list colorings, L(2,1)-colorings, and set colorings. Another area of emphasis is on algebraic methods involving the study of homomorphisms of graphs, with special concentration on problems arising from statistical physics and problems of combinatorial geometry. The participants include over 58 faculty members from DIMACS, DIMATIA, Rényi, and other institutions, as well as 88 graduate and undergraduate students. Organizers: Gyula Katona (Rényi), Fred Roberts (DIMACS), and Jaroslav Nešetřil (DIMATIA). NSF funded at $155,949 for 3 years.

Computer Science and Decision Theory

This project is in collaboration with LAMSADE, based at Université Paris IX - Dauphine. It is organized around modern CS applications of methods developed by decision theorists, in particular methods involving consensus and associated order relations. The project seeks to explore the connections between CS and decision theory, develop new decision-theory-based methodologies relevant to the scope of modern CS problems, and investigate their applications to problems of CS and also to problems of the social sciences that could benefit from new ideas and techniques. The topics in this project have laid the groundwork for a planned SF on “algorithmic decision theory” that has been developed by Michael Littman (RU-CS), David Madigan (RU-Statistics), and Robert Schapire (Princeton). The topics are closely related to our current SF on Computation and the Socio-Economic Sciences. Organizers: Denis Bouyssou and Alexis Tsoukias (Lamsade), Fred Roberts and Mel Janowitz (DIMACS), and Phillipe Vincke (Université Libre de Bruxelles). NSF funded at $39,000 for 3 years.

2003-2006 Special Focus on Communication Security and Information Privacy

Vitally important aspects of our modern society have become dependent on rapid and secure communication, which is increasingly electronic. The new electronic age offers vast potential for new services and applications, but gives rise to serious new vulnerabilities and security threats. Moreover, many of the most important new applications come at the price of threats to privacy. This SF is exploring the new vulnerabilities and threats and new methods for dealing with them. Working Groups in this SF

are investigating or will investigate On-line Privacy, Privacy/Confidentiality of Health Care Data, Intrusion Detection and Network Security Management Systems, the Secure and Efficient Extraction of Joint Information from Multiple Data Sets, and Mobile Code Security. Examples of workshops include Large-scale Internet Attacks, Intellectual Property Protection, Security of Web Services and E-Commerce, Cryptography (Theory Meets Practice), Security Analysis of Protocols, and Electronic Voting. Organizers: Bill Aiello (U. British Columbia), Joe Kilian (RU-CS), Ronitt Rubinfeld (MIT), Rebecca Wright (Stevens). NSF funded at $350,000 for 3 years.

2006-2009 Special Focus on Discrete Random Systems

This new SF, launched in April 2006, brings together researchers from various fields to explore topics at the interface of discrete mathematics, theoretical computer science, and statistical physics. The focus is on probabilistic algorithms and models that arise in the study of physical systems and combinatorial structures. This broad field requires insights and techniques from the study of phase transitions in statistical physics, probabilistic methods from combinatorics, and randomized algorithms in theoretical computer science. This area is of increasing commercial, economic, and societal relevance as large-scale real-world systems, from biological epidemics to the world-wide web's structure to efficient highway emergency-repair scheduling, are successfully modeled stochastically. Strong themes/topics running through these interactions include (1) phase transitions in (infinite-sized) physical systems such as Ising, Potts, and percolation models; (2) rapid or torpid mixing of Markov Chain Monte Carlo (MCMC) processes in finite-sized physical systems; (3) approximate counting and approximate (or perfect) uniform sampling of combinatorial structures such as perfect matchings, through MCMC and other techniques; (4) randomized algorithms for combinatorial decision, optimization, and enumeration problems; (5) random structures such as random graphs and random CNF formulas, including questions of existence, optimization, phase transitions, and connections between phase transitions and computational intractability; (6) probabilistic combinatorics including extremal combinatorics; (7) optimization and analysis for real-world problems and structures that may be modeled by random structures. Examples of workshops include Properties of Large Graphs; Complex Networks and Their Applications; Markov-Chain Monte Carlo; and Phase Transitions in Random Structures and Algorithms. Working groups will include From Heuristics to Rigor in Phase Transitions and Current Topics in Markov Chains and Phase Transitions. Organizers: Christian Borgs (Microsoft), Dana Randall (Georgia Tech), Greg Sorkin (IBM), Eric Vigoda (Georgia Tech), Peter Winkler (Dartmouth). Local Collaborators: Jeff Kahn (RU-Math), Joel Lebowitz (RU-Math), Van Vu (RU-Math). Support has been obtained from NSF ($191,500 for 2 years) and NSA ($15,000).

Future Special Focus on Algorithmic Foundations of the Internet

The Internet was originally designed as a research network without the expectation that it would eventually be used for everything from banking, commerce, and telecommunications to remote management of power plants and power grid configurations. Additionally, security was not a major goal of the original design of Internet protocols, and it is now far too easy for malicious agents to engage in disruptive activities such as denial-of-service attacks, phishing, and sending huge amounts of spam. The need to manage the network was not in mind from the beginning, making it difficult for network administrators to tune the protocols to perform well or pinpoint the root cause of a problem. The planned 3-year SF is devoted to the study of algorithms and protocols for large-scale networks in a way that is guided by a deep understanding of the current Internet while simultaneously allowing for the possibility of radical change where this is warranted. We will seek to analyze and design protocols, algorithms, and architectures for a future Internet in a way that has strong foundations and promotes scalability, security, and manageability. The focus aims to enhance our understanding of the limitations of today’s protocols, as well as the gains that a new design could achieve. This is an emerging cross-disciplinary area that requires expertise from several fields including networking, theory of computing, computer and

communications security, and game theory. This SF is especially timely in light of NSF's FIND (Future INternet Design) and GENI (Global Environment for Network Innovations) initiatives. The FIND program encourages the research community to take a "clean slate" approach to the design of a future Internet, without the constraints of backwards compatibility with the current protocols. Planned workshops or working groups include: Secure Internet Routing; Wireless and Delay-Tolerant Networks; Internet Tomography; Internet Economics and Game Theory; Internet Privacy: Facilitating Seamless Data Movement with Appropriate Controls. Organizers: Alejandro Lopez-Ortiz (University of Waterloo), Jennifer Rexford (Princeton), Rebecca Wright (Stevens).

Experimental Analysis of Algorithms

DIMACS has been a pioneer in the development of "experimental computing" through its annual "Algorithm Implementation Challenge." Presented with both real and random data sets and prototype problems, researchers are challenged to develop new and highly efficient methods for solving them, are given feedback by an international steering committee, and are brought together to share their ideas and methods. From the earliest Challenge on Network Flows and Matching (1990-91) to the latest Challenge on the Shortest Path Problem (2005-2006, ongoing), these challenges have led to pioneering research results at the forefront of algorithm development. For example, the 4th Challenge on Fragment Assembly and Genome rearrangement (1994-95) was signficant in that results showed that several supposedly already-established sequences were in fact non-optimal.

Analysis of algorithms through experimentation is a standard tool in CS and related disciplines. This SF will begin by concentrating on combinatorial optimization. Algorithmic research in this field is unusually rich in data. Methods are needed to answer hard statistical questions, such as rates of convergence, finding the functional model, and extrapolating beyond the range of the data. Normal parametric models frequently don't apply, and nonparametric methods may be more appropriate. These properties combine to make experimental analysis of algorithms unusual from a statistical methodology point of view. New techniques are needed; standard techniques must be re-evaluated for these purposes. There are important opportunities for new partnerships between computer scientists and statisticians. We plan to develop workshops and working groups that involve researchers from both fields. Organizers: David Johnson (AT&T Labs), Cathy McGeoch (Amherst College), Regina Liu (RU-Statistics), Alan Karr (NISS).

Research Thrust 2: Homeland Security

DIMACS involvement in homeland security arose from the special focus on Computational and Mathematical Epidemiology, which took on a bioterrorism theme after the events of September 11, 2001 and the following anthrax attacks.

The Homeland Security Center for Dynamic Data Analysis (DyDAn)

DyDAn is one of four university-based United States Department of Homeland Security centers connected to the DHS' new Institute for Discrete Sciences (see Sec. 2.5). The DHS award for DyDAn is $3M for 3 years.

Homeland security requires that we draw inferences about activities from massive flows of data arriving continuously over time. Buried in this data are patterns and behaviors that are changing, often quite quickly. We plan to develop novel technologies that will find patterns and relationships in dynamic, nonstationary, sometimes massive datasets, and pioneer educational programs that will nurture the homeland security workforce of the future. DyDAn's research spans two areas: (1) Analysis of Large, Dynamic Multigraphs and (2) Continuous, Distributed Monitoring of Dynamic, Heterogeneous Data. Our work involves Information Management and Knowledge Discovery and fundamental topics in Discrete

Mathematical Foundations. We plan nine initial research projects, four starting in Year 1 (denoted by *). Group (1) projects are Analysis of Large, Dynamic Multigraphs Arising from Blogs; Universal Information Graphs*; Statistical and Graph-Theoretical Approaches to Time-Varying Multigraphs*; Adding Semantics to and Interconnecting Semantic Graphs*; and Algorithms for Identifying Hidden Social Structures in Virtual Communities. Group (2) projects are Continuous Distributed Data Stream Monitoring; Message Filtering and Entity Resolution; Dynamic Similarity Search in Multi-Modal Data; and Optimization and Data Mining*. Each project involves researchers from several DyDAn partner institutions, in true partnerships.

Port of Entry Inspection Algorithms and Laboratory for Port Security

This project is developing decision support algorithms that will help to optimally intercept illicit materials and weapons entering US ports and will test the algorithms on real data arising from port-of-entry inspection. The algorithms we seek will find inspection schemes that minimize total cost, including "cost" of false positives and false negatives. These algorithms are based on finding optimal binary decision trees representing Boolean decision functions, using a sequential decision making framework. The project is being carried out in collaboration with a team from the Los Alamos National Laboratory. Los Alamos is funding its participation (up to half time FTE). ONR has provided seed money ($60,000 for 2 years) for the DIMACS side and NSF has also provided funding ($599,999 for 3 years). Using this project as a starting point, a Laboratory for Port Security has been established with a $120,000 Academic Excellence Award to DIMACS from Rutgers in collaboration with the Rutgers Center for Advanced Infrastructure and Transportation (CAIT). Its focus is on modeling, simulation, surveillance, and algorithms relating to port security. Participants: Tayfur Altiok (RU-IE), Endre Boros (RUTCOR), Elsayed Elsayed (RU-IE), Paul Kantor (RU-SCILS), Alex Kogan (RU-Business School), Paul Lioy (University of Medicine and Dentistry of NJ), David Madigan (RU-Statistics), Ali Maher (RU-Civil Eng), Richard Mammone (RU-ECE), Benjamin Melamed (RU-Business School), S. Muthukrishnan (RU-CS), Feng Pan (Los Alamos), Richard Picard (Los Alamos), Fred Roberts (DIMACS), Kevin Saeger (Los Alamos), Philip Stroud (Los Alamos), Minge Xie (RU-Statistics) plus 8 graduate students (4 per year).

Monitoring Message Streams (MMS)

The MMS project aims to develop methods to monitor huge streams of text data for messages and to identify clusters of messages on events of interest. There are three themes to our work. 1) We attack all five stages of message filtering (compression/indexing, text representation, matching/similarity measures, learning from data and prior knowledge, and fusing of results from multiple sources) simultaneously, with particular attention to interactions between them. 2) We pursue algorithmic improvements that allow tunable tradeoffs between increased effectiveness and reduced resource usage (memory, CPU). 3) We seek ways to use all available information resources to reduce the need for the users of filtering systems to provide large amounts of training data or other labor-intensive input. Major directions of work have involved Bayesian methods, k-nearest neighbor algorithms, streaming data analysis, and formal models of "adaptive filtering." The MMS project is funded by the intelligence community through money provided to NSF. This project has received regular funding since 2002 and has so far led to $2,047,523 over 5 years. Participants: Graham Cormode (DIMACS/Bell Labs/AT&T Labs), Paul Kantor (RU-SCILS), Wen-Hua Ju (Avaya), David Lewis (consultant), Michael Littman (RU-CS), David Madigan (RU-Statistics), Ilya Muchnik (DIMACS), S. Muthukrishnan (RU-CS), Rafail Ostrovsky (Telcordia/UCLA), Fred Roberts (DIMACS), Martin Strauss (AT&T Labs/Princeton) plus 6 graduate students (two per year).

Author Identification

We are developing techniques for identifying authors in large collections of textual artifacts (e-mails, communiques, transcribed speech, etc.). Our approach focuses on very high-dimensional, topic-free

document representations and particular attribution problems. One thread of our work concerns applications where all documents come from a single genre (e.g., listserv posts or blog entries or technical papers). Another thread focuses on the more challenging cross-genre context - given documents from one genre, can we attribute authorship of documents in a different genre? This project was funded by the intelligence community through NSF for $239,500 for 1 year and is currently funded by NSF for $56,019 for 1 year. The project has led to our scoring best on several entity resolution tasks in the KDD Challenges 2005. It is continuing through DyDAn. Participants: Paul Kantor (RU-SCILS), David Lewis (consultant), David Madigan (RU-Statistics), Fred Roberts (DIMACS).

Analysis of Dynamic Blog Multi-Graph Streams

This project focuses on open source data mining. In particular, we are concentrating on the challenges posed by blogs, as these have the potential for the greatest rewards in terms of uncovering useful information and intelligence. In addition, the project is looking at incremental, scalable analysis under strong resource constraints. We are taking blog streams as input and outputting (multi-)graphs with labeled nodes and edges. We adopt a two level model of blogs and related web pages. The project is funded by the Intelligence Community via NSF for $200,000 for 1 year. Participants: Graham Cormode (AT&T Labs), Haym Hirsh (RU-CS), S. Muthukrishnan (RU-CS), Fred Roberts (DIMACS)

Planned Special Focus on Emergency Preparedness

This SF will draw on mathematical models and algorithms relevant to responses to natural and human-caused disasters such as hurricanes and pandemic flu. Emergency planning topics of interest include locating critical supplies and equipment prior to the occurrence of an emergency and dynamic response as a disaster unfolds. We will consider algorithms for evacuation in networks that change over time and model "crowd dynamics" in evacuation situations, which relates to the SF on Discrete Random Systems. There are a variety of topics in sensing and surveillance that will become part of this SF. Many these combine statistical decision making with graph models and algorithms to detect contaminant releases or identify suspicious behavior before a disaster occurs. We will also explore ways to assure and exploit communication technology. This topic area includes traditional topics in survivable networks, but also includes strategies to enhance an existing infrastructure during an emergency, and new communication technologies to enable more informed responses to dynamic emergency situations. Organizing Committee: Yuliy Barishnikov (Bell Labs), Tamra Carpenter (DIMACS), Hanan Luss (Telcordia), Warren Powell (Princeton)

Research Thrust 3: The Interface between Biology and Math/CS

Early on, DIMACS became involved with research at the interface of Biology and Mathematics/CS. Many of the topics in computational molecular biology that were subjects of research workshops in our "Special Year" on Mathematical Support for Molecular Biology starting in 1994 have become standard tools of computational molecular biology. Sequence alignment, physical mapping and information theoretic approaches to phylogenetic tree reconstruction are examples. We have now branched out to other biological topics. The following projects are some of the highlights of our Bio-Math/CS thrust.

2002-2007 Special Focus on Computational and Mathematical Epidemiology

Mathematical methods are important tools in analyzing the spread and control of diseases. The size of modern epidemiological problems and the complex data sets arising call out for the use of powerful new methods of math and CS. This SF is based on the belief that partnerships between mathematicians/ computer scientists and epidemiologists can make important new contributions to the development and application of these methods. Working groups are investigating issues in CS and related mathematics that need to be resolved to make progress on important problems in epidemiology. Their topics include:

Adverse Event/Disease Reporting, Surveillance, and Analysis (in strong partnership with the Centers for Disease Control and Prevention); Data Mining and Epidemiology; Analogies Between Computer Viruses and Immune Systems and Biological Viruses and Immune Systems; Distributed Computing, Social Networks, and Disease Spread Processes; Phylogenetic Trees and Rapidly Evolving Diseases; Spatio-Temporal and Network Modeling of Diseases; and Methodologies for Comparing Vaccination Strategies. There are workshops, aimed at catalyzing interdisciplinary collaborations, on Spatial Epidemiology and Geographical Information Systems; Genomic Instability in Cancer; Genetics and Evolution of Pathogens; Botanical Epidemiology; The Pathogenesis of Infectious Disease: Host-Pathogen Dynamics; Models of CoEvolution of Hosts and Pathogens; and Combinatorial Group Testing. Organizers: Martin Farach-Colton (RU-CS), Sunetra Gupta (Oxford), Don Hoover (RU-Statistics), David Krakauer (Santa Fe Institute), Simon Levin (Princeton), Marc Lipsitch (Harvard), David Madigan (RU-Statistics), Megan Murray (Harvard), S. Muthukrishnan (RU-CS), David Ozonoff (Boston U.), Fred Roberts (DIMACS), Burton Singer (Princeton), Daniel Wartenburg (University of Medicine and Dentistry of NJ). A $2.75M ITR award from NSF and awards from the Sloan Foundation and Office of Naval Research fund this project.

2005-2008 Special Focus on Information Processing in Biology

Modern biology has become an information science. Progress in the field of biological information processing will require interdisciplinary collaborations among computer scientists, mathematicians, physicists, chemists, and biologists. This SF is built around workshops that will enhance the interdisciplinary collaborations beginning to form and introduce outstanding junior people to problems and topics at the forefront of research. The SF is organized around four themes: (1) Algorithmic Approaches to Biological Information Processing; (2) Computer Science, Engineering and Biology: Applications and Analogies; (3) Biological Circuits and Cellular Signaling; (4) Proteomics. Examples of workshops include Machine Learning Approaches for Understanding Gene Regulation; Computational Tumor Modeling; Nanotechnology and Biology; The Mechanism and Applications of the RNA Interference Process; Strategies for Reverse Engineering Biological Circuits; Cell Communication and Information Processing in Developing Tissues; Dynamics of Biological Networks; Information Processing by Protein Structures in Molecular Recognition; Functional Proteomics of Neurodegenerative Diseases; and Implications of Mathematical Models of Infection and Molecular Modeling of Hepatitis B Virus. Organizers: Ron Levy (RU-Chemistry/BioChem), Wilma Olson (RU-Chemistry/BioChem), Fred Roberts (DIMACS), Eduardo Sontag (RU-Math). This SF is funded by NSF ($308,900 for 3 years plus $23,900 added by NIH) and by about a third of a second NSF grant ($300,000 for 3 years) for miscellaneous workshops at DIMACS.

Mathematical Modeling of Infectious Diseases in Africa

Mathematical modeling of the spread of infectious disease has a long history going back to Bernoulli's modeling of smallpox in 1760. In recent years, models have been vitally important in the development of approaches to such critical diseases as HIV/AIDS, which is of such importance to Africa. Modelers in collaboration with public health officials also played an important role during the 2003 SARS outbreaks and are already working to determine ways to contain the spread of a pending influenza pandemic. DIMACS, in collaboration with SACEMA and AIMS (see Section 2.5), has developed workshops to initiate collaborations between US and African scientists. The workshops and an Advanced Study Institute are exposing junior US and African scientists and students to the special challenges of modeling the spread of disease in Africa and providing opportunities to collaborate in developing and applying the tools of mathematical modeling to the tremendous health problems caused by such diseases as HIV/AIDS, tuberculosis and malaria, as well as to the design of possible interventions in the case of major new health threats such as pandemic influenza in a developing region of the world. DIMACS/SACEMA/AIMS held a workshop in Johannesburg in September 2006 and in June 2007 will

hold an Advanced Study Institute at AIMS in Cape Town, followed by a capstone workshop, enabling institute students to interact with US and African researchers who are currently actively involved in the modeling of diseases in Africa. Organizers: Dominic Clemence (North Carolina A&T State University), Wayne Getz (UC Berkeley), Abba Gumel (University of Manitoba), Fritz Hahne (AIMS), John Hargrove (SACEMA), Edward Lungu (University of Botswana), Fred Roberts (DIMACS), Simon Levin (Princeton). The project is funded by two NSF grants totaling $203,794 over 2 years.

The DNA Barcode of Life

The Barcode of Life project aims to create a global standard for species identification known as a DNA barcode using a particular gene in the mitochondrial genome. DIMACS has joined with the Consortium for the Barcode of Life (CBOL), which is supported by the Alfred P. Sloan Foundation and hosted by the Smithsonian Institution's National Museum of Natural History. CBOL's Data Analysis Working Group (DAWG) is developing a new generation of analytical protocols and techniques for DNA barcode data, with the international side based at the National Museum of Natural History in Paris and the US side based at DIMACS. DIMACS organized "brainstorming" meetings to identify CS and statistics problems arising from DNA barcoding and is running an international competition to develop new analytical tools, building on the long-standing DIMACS program of algorithm implementation challenges. Organizers: Rebecka Jornsten (RU-Statistics), Javier Cabrera (RU-Statistics), David Madigan (RU-Statistics), and Fred Roberts (DIMACS). The project is funded by the Smithsonian Institution, the CBOL, and NSF.

Bioterrorism Sensor Location

Part of the planned defense against bioterrorism is to develop and place sensors that provide timely warning of a bioterrorist attack. Locating sensors to maximize coverage and minimize the time to detect an attack is not easy. This project is aimed at formulating the sensor location problem (SLP) and developing effective algorithms for solving it. When sensors set off an alarm, decision makers need to decide whether or not an attack has taken place, estimate its extent and location, and choose among possible responses. They can be guided by the pattern of sensor alarms. The problem of how to interpret this pattern, the Pattern Interpretation Problem (PIP), presents a major challenge that is intertwined with the SLP. This project is formulating the PIP and finding methods for solving it, while attacking the PIP and SLP together. The project was proposed to us by the Defense Intelligence Agency and the MITRE Corporation. It has not yet received external funding directly, though it has been funded under our Special Focus on Computational and Mathematical Epidemiology. Participants: Benjamin Avi-Itzhak (RUTCOR), Tom Boucher (RU-IE), Tamra Carpenter (Telcordia/DIMACS), Elsayed Elsayed (RU-IE), Panos Georgopoulos (University of Medicine and Dentistry of NJ), Paul Kantor (RU-SCILS), Howard Karloff (AT&T Labs), Jon Kettenring (Telcordia/Drew), Paul Lioy (University of Medicine and Dentistry of NJ), David Madigan (RU-Statistics), S. Muthukrishnan (RU-CS), Rafail Ostrovsky (Telcordia/UCLA), Michael Rothkopf (RUTCOR), Yehuda Vardi (RU-Statistics, deceased)

3.3 Research Publications

The DIMACS Book Series, published by the American Mathematical Society, was launched in 1990, just after the Center's founding. Until 2004, many books in the series were essentially proceedings of DIMACS workshops, with some supplementary articles. Starting in 2004, the emphasis shifted to volumes that will have an even more significant impact on the development of a field. Books coming out of a DIMACS SF program, or resulting from a combination of ideas in a series of DIMACS workshops, include strong expository or survey articles, as well as focused research articles. There are also monographs and books exploring educational issues. The series produces books that will be useful as an

exploration of a field's new directions, as reference works, or as introductions for people in other fields. The titles of the current 71 volumes are given in Appendix 6.3.

DIMACS Technical Reports document accomplishments that result from Center programs. Reports cover research as well as educational and technology issues. The Reports are published on the DIMACS website. To date there are 1028 reports. Most of these reports have eventually become publications in journals or conference proceedings, and these represent just a fraction of the publications traceable to DIMACS activities. A listing of recent titles is given in Appendix 6.3.

3.4 Analysis of Research Program:

The last few years have been very good ones for DIMACS. In the six years since the end of our NSF STC award, we have made major strides to change the scope of the Center and these have been recognized in important ways. Our 2005 NSF Infrastructure Award recognized the importance of our new breadth and direction, and NSF officials stressed the impact of these changes on the receipt of the award. Our leadership in newer areas of research for DIMACS was recognized by the DHS center award. We have continued to have success with support for our research projects and our SF programs, from a variety of sources. However, there are some issues the Center must face.

SF programs are still the signature activities of DIMACS and are a major reason the center is still thought of so highly by so many people. We have evolved to the model of running a number of multi-year special foci at once. There are several reasons. It takes a great deal of work to gear up for a SF program and, after that, it seems a waste not to let it continue. Multiple year programs are especially important when we aim for interactions, interdisciplinarity, etc. The membership of DIMACS and of the communities the Center serves display a wide range of scientific interests and having a variety of different special foci running concurrently engages a larger percentage of the DIMACS community. There are also financial considerations: It is hard to support the Center’s infrastructure with a single focus.

While special foci and workshops have always given rise to funded DIMACS research projects, the number of such has increased in recent years. The vastly increased scope of DIMACS research projects has enabled us to reach out to faculty who were not previously engaged in the Center. Our port security projects are a case in point, where we have engaged faculty from Industrial and Systems Engineering, Electrical and Computer Engineering, and the School of Business, in addition to faculty from SCILS, RUTCOR, Computer Science, Statistics, and Mathematics.

There are those in the DIMACS community (and in the DM/TCS community more generally) who would like to see DIMACS return to an emphasis on its core activities, even if that means a much smaller, more modest center. The DIMACS Executive Committee, Council, and Advisory Board have discussed this issue quite often. To some extent, many members of these leadership committees feel that it is a matter of perception that DIMACS is no longer heavily involved with these core activities. Indeed, DIMACS has obtained funds to run core area workshops and research projects, exchange students with partners, support student research in core areas, and run an exciting new special focus, Discrete Random Systems, in a core area. Moreover, DIMACS has regularly offered to provide funds for core activities. However, DIMACS depends on volunteers, and there is sometimes a shortage. Certainly DIMACS has taken on a much broader scope than it had in its early years, motivated in part by fiscal realities and in part by the desire to apply methods of DM/TCS in other disciplines. The Executive Committee, Council, and Advisory Board have regularly supported efforts to broaden scope, and, as noted, NSF has emphasized the importance of these efforts. While there are those who feel that DIMACS has relinquished some of its leadership role in DM/TCS by broadening its scope, many others feel that the Center is doing something very important for its core constituency by finding a variety of research challenges where DM/TCS, broadly speaking, can be helpful.

DIMACS has always considered itself a national, indeed international, organization, and our NSF funders prefer it that way. Participants in DIMACS programs come from all over the world. About 70% of our workshop/special focus participants come from outside the region and over 90% of our visitors do. In continuing to expand our national scope, we have in recent years run workshops and other DIMACS programs in numerous locations, including San Jose, CA, Cambridge, MA, New York, NY, Tallahassee, FL, Bethesda, MD, San Diego, CA, and Atlanta, GA, as well as in foreign locations such as Paris, Hong Kong, Hsinchu (Taiwan), Auckland, Johannesburg, Montreal, Prague, and Budapest. We have research partners all over the US and the world, and it continues to be relatively easy to recruit outstanding researchers from around the world to participate in and run our programs.

4. Educational Program

4.1 Structure and Curriculum:

DIMACS has won widespread recognition for its innovative educational programs. Since its inception, DIMACS has integrated research and education. All of our SF programs have included tutorials, funds for students to participate in workshops, and programs of awards for graduate students to do guided research projects under the SF auspices. Our programs for graduate students and for postdoctoral fellows are described in Section 4.2. Graduate students and undergraduates are participants in DIMACS research projects. Evaluations of DIMACS programs, in particular SF programs, cite the SF influence on the careers of the students and postdocs involved. DIMACS does not offer degrees and does not give courses for credit, but it collaborates with faculty who give courses in their own departments. The one exception is that the participants in DIMACS high school teacher programs described below receive graduate course credit through the Graduate School of Education at Rutgers.

The Reconnect Program

This program seeks to "reconnect" to the computer science/mathematics research enterprise two- and four-year college faculty with little time for independent research. It aims to reinvigorate their careers and enhance their teaching by exposing them to current research topics in CS and related mathematics that are relevant to the undergraduate classroom. Participants prepare written classroom materials based on current research topics and have the opportunity to publish them in the DIMACS Educational Modules Series. The first phase of Reconnect was a series of summer conferences at DIMACS. In its second phase, the program was replicated at nationwide satellite locations, with an emphasis on minority institutions, including Spelman College and Morgan State University. The third phase of Reconnect begins in 2007, with support through the new DHS Center DyDAn, and will emphasize homeland security topics. The Reconnect program has led to the introduction into the undergraduate curriculum of topics in computational molecular biology, network visualization, computational geometry, clustering methods, etc., and has had a profound impact on the careers of the participants. Some of them have returned to active research and to renewed excitement about their teaching. The current Reconnect is funded ($636,376 for 3 years) by NSF.

The REU Program

Since 1992 the DIMACS Research Experiences for Undergraduates (REU) program has had over 230 undergraduates from all over the US and from its partner, DIMATIA in the Czech Republic, participating in mentored research. This highly successful program is relatively unique because of its context in a research center and its international component has been a pioneering project for NSF. Our current program involves more than 25 students per year and is shared with our sister center DIMATIA at

Charles University in Prague, as well as with the Rutgers Math Department. Students spend 8 weeks at DIMACS, working one-on-one under the direction of a mentor (faculty, postdoc, or DIMACS visitor). A subgroup of the students then spends three weeks at DIMATIA. Our REU graduates have gone to outstanding graduate schools, won major awards such as Fulbrights and NSF Fellowships, and obtained faculty positions at such institutions as CMU and U. of Chicago. In follow up surveys, 100% of "alumni" respondents report going on to, completing, or planning to pursue graduate education. Students in the DIMACS REU program regularly write research papers and make presentations at national and international scientific meetings. Recently, one of our REU students won a best research award from the Association for Women in Mathematics for her work on mobile robotics navigation. Another was introduced to biomedical engineering and went on to do work on a prosthetic hand, and another developed models of DNA supercoiling. Still another solved an open problem on universal *H*-colorable graphs and two REU students settled a conjecture about the stable marriage problem. Through DyDAn, we will be expanding our REU program in the direction of homeland security research. The most recent version of REU is funded by an NSF REU site award ($654,305 for 5 years) with supplementary funding from the Czech side.

K-12 Programs

The Leadership Program in Discrete Mathematics: LP aimed first at high school teachers, later at middle school teachers, and most recently at K-8 teachers. Since it began in 1989, LP has developed a cadre of "lead teachers" who have mastered methods of discrete mathematics and teach these not only to the students in their classrooms, but also to their colleagues through workshops in their own districts and at regional and national conferences. Hundreds of teachers have participated in these programs, and thousands have benefited indirectly through follow-up outreach efforts such as our "Workshops in Your District Program." LP continues in a "satellite" version with sessions around the nation.

New Jersey Curriculum Standards: DIMACS played a central role in development of the New Jersey Curriculum "Standards" for mathematics and a Curriculum "Framework" based on those standards that has become a model nationally and internationally. The "Standards" say what students at all grade levels are expected to achieve in all areas of mathematics. The "Framework" describes how the standards can be implemented in classrooms and curricula, with many examples resulting from programs originated at DIMACS. Some of the new ways of presenting discrete mathematics are in the DIMACS book *Discrete Mathematics in the Schools* that is by far the best-selling book in the 71-volume DIMACS/AMS series.

DCI/DREI: The DIMACS Connect Institute (DCI) and its predecessor DIMACS Research and Education Institute (DREI) paired teachers with researchers, introduced teachers to current topics in DM/TCS that could be brought into the high school classroom, and led to numerous exciting outcomes. High school teachers obtained research results and brought ideas to their students. Students did original research that has led to awards and even presentations at DIMACS research conferences, such as a smallpox model presented at an Epidemiological Modeling workshop. Researchers developed a long term interest in pre-college education. A group of teachers who participated in DCI and DREI have gone on to become the lead organizers/writers for the CBS TV series NUMB3RS, writing weekly materials that high school teachers can use in their classrooms in conjunction with the latest TV episode.

High School Student Research Conference: In 2001, DIMACS launched its program of annual high school student research conferences. Many of the participants are students whose teachers participated in DCI. The student presentations have been well-prepared and the research substantive. For instance, at the 2002 conference, a group of middle-school students presented results that conference keynote lecturer Joe O'Rourke (Smith College) categorized as rediscovering the key idea in "a mildly famous and non-obvious construction" for visibility in polyhedra. The students and their teachers remained in communication with O'Rourke, who also introduced them to unpublished work on related problems.

DIMACS Educational Modules Series

The DCI/DREI and Reconnect programs led to classroom materials that have been published in the DIMACS Educational Modules series, refereed with the help of a distinguished group of editors expert in math/CS education. To date, 10 modules have been published in the series. Modules form a key component of our activities in bringing Bio-Math into the high schools.

Bio-Math in the Schools

BMCI: Driven by large scientific endeavors such as the human genome project, modern biology has become very much an information science, closely tied to tools and methods of the mathematical sciences. Increasingly, undergraduate and graduate students are being exposed to the interconnections between the mathematical and biological sciences. However, for the most part, high schools have done little to develop these interconnections. In the summer of 2004 we developed the Bio-Math Connect Institute (BMCI). BMCI built on 18 years of DIMACS experience with subject-area research in bio-math and in K-12 educational programs, including unique bio-math education programs at the K-12 through postdoctoral level. BMCI was run as an experimental program during summers 2004, 2005, and 2006, first with math teachers, then with teams of math and bio teachers, under modest NSF funding (three separate grants totaling $262,406) and support from the Rutgers University Academic Excellence Fund ($100,000). The program featured research experiences for teachers and teacher involvement in development of instructional modules to be used in high school classrooms. BMCI was complemented by an international conference on bio-math in the schools in Spring 2005 ($20,000 from NSF), which will lead to a DIMACS book on the topic.

The Bio-Math Connection: The BMCI experiments have led to a substantial NSF grant to DIMACS for the new "BioMath Connection" (BMC). In BMC, we will produce 15 modules for classroom use in biology and mathematics classes, covering topics in computational molecular biology, mathematical epidemiology, and ecology/population biology. Some of the modules developed in BMCI will form the starting point for BMC. The $2.55M grant will also support pilot- and field-testing of the modules, teacher training workshops, and extensive evaluation of the concepts and materials. We are partnering on this project with COMAP (The Consortium for Mathematics and its Applications), a renowned developer of modular materials for the schools, and with internationally-known experts in evaluation from Colorado State University. Just as DIMACS was one of the pioneers in introducing a large number of computer scientists to the field of computational biology in the early 1990's, today it has the opportunity to bring the interface between the mathematical and biological sciences to the high schools in this exciting project.

4.2 Student Profile:

Undergraduate Student Participation

Undergraduates participate in DIMACS primarily through its REU program, described in Sections 2.5 and 4.1. There were 27 REU participants in 2005 and 31 in 2006. They were selected from schools with little opportunity for undergraduate research as well as from major research universities. About a third of the participants are from Rutgers and four or five a year are from our international partner, DIMATIA in Prague. Topics have ranged from pure mathematics and TCS to very specific applications. Mentors have been from a wide variety of Rutgers departments, including Math, CS, Industrial Engineering, Biomedical Engineering, RUTCOR, SCILS, Chemistry/Biochemistry, and Statistics. Post program surveys indicate that participation in the REU has a significant influence on participants' decisions to attend graduate school and pursue research careers. We are exploring expanding the international aspects of our REU program. We have begun discussions with institutions in China after Fred Roberts' visit to China as part

of a DIMACS/NSF-CISE delegation in May 2006, and with institutions in South Africa as a result of the DIMACS workshop on epidemiology. A list of 2005 and 2006 REU students, their home institutions, projects, and mentors, is given in Appendix 6.4.

Graduate Student Participation

DIMACS provides formal opportunities for graduate student participation and encourages students to attend workshops and tutorials. There are competitions in the summer and winter for small awards to support Rutgers and Princeton graduate student research. The students are primarily from the departments of Mathematics, CS, and RUTCOR. In 2005 there were 29 awards made to 24 students, with some students receiving awards in both summer and winter. Some examples of topics are: Maximum Patterns and Binarization in Logical Analysis of Data, Computer-aided Drug Discovery, Detecting Clusters of Orthologous Genes in a Large Set of Genomes, and Online Algorithms for Buy-at-bulk Network Design. In 2006 there were 28 awards to 24 students. Topics include: Bounding Multivariate Probability Distribution Functions, Classifying Sequences of Variable Length, Zero-one Laws for First Order Logic Statements in Random Geometric Graphs, and a Support Vector Machine Based on Logical Patterns.

Graduate students are an important part of the REU program, serving as graduate student coordinators who mentor students, arrange seminars, and serve as role models. Dan Kral progressed from REU participant to REU graduate student coordinator to active participant in several DIMACS programs to Fulbright fellowship visitor at Georgia Tech. DIMACS international research collaboration with DIMATIA and the Rényi Institute included 88 students. (See Appendix 6.4 for a list.) Graduate students from all three partners have been active participants in these groups, making presentations and being involved in organizing meetings. In addition, students from Rutgers and Georgia Tech participated in DIMATIA's Spring School in 2006 with DIMACS support.

The DIMACS collaborative project on CS and decision theory with LAMSADE at the University of Paris-Dauphine includes the exchange of graduate students for extended visits. Two LAMSADE students visited DIMACS in 2004, while two Rutgers students visited LAMSADE in 2005 and three visited in 2006. This exchange has already resulted in international Ph.D committees and two joint Rutgers faculty papers with a LAMSADE student, one on polynomial approximation of the quadratic set covering problem, and one on applying consistent sets to voting. Other graduate students have been provided support to participate in DIMACS/LAMSADE workshops.

Rutgers graduate students have essential involvement in DIMACS research projects. Currently Graduate Assistants are working on the Monitoring Message Streams project, in the Laboratory for Port Security, on Computational Epidemiology, on the NSF Port-of-Entry Inspection project, and on the Multi-graph Blog Mining project. Rutgers and Princeton graduate students will be involved in all of the new DHS DyDAn Center projects, with four students supported in the first year. Additional center funds will allow our graduate students to make extended visits to national laboratories such as Lawrence Livermore.

Graduate students world-wide benefit from funds for participation in Center workshops and tutorials and from the program of long-term visits by students to DIMACS academic and industrial partner locations.

Postdocs

The DIMACS postdoc program immerses outstanding junior researchers in the life of the Center. Each postdoc is assigned a faculty mentor. Some postdocs work on their own research projects, and others on DIMACS projects. Moreover, because we want to train our postdocs to take an interest in educational activities and in outreach beyond the mathematical sciences, we ask each postdoc to take part in such activities. Our postdocs meet this requirement in a variety of ways, such as helping with our K-12 and

"Reconnect" programs or mentoring in our REU program. Our postdoctoral fellows from past years have been remarkably successful in obtaining positions, both in academics and in industry. They have also rapidly risen to the top of their profession. A postdoctoral fellowship at DIMACS remains a very highly sought-after award for junior researchers.

4.3 Analysis of Educational Program:

Educational programs are intertwined with almost everything DIMACS does. The participants in these programs routinely tell us about the impact of the programs on their careers and their lives. We are especially proud of having "changed the culture" in many ways, getting high-powered researchers involved with educational programs at all levels and instilling in our students and postdoctoral fellows an abiding commitment to education.

The challenges of raising outside funds to support our many educational programs, reporting to granting agencies, and managing these programs are similar to those described in our discussion of DIMACS research programs in Section 3.4. When DIMACS was an NSF STC, we had a substantial source of graduate student support. Indeed, we were able to support nine graduate students annually at Rutgers and six at Princeton. Now, we have no stable source of funds for graduate student support and depend on individual grants for that purpose. Still, we feel that we have succeeded in providing unique educational and research opportunities for local graduate students as well as students from elsewhere. Graduate students are regular participants in Center workshops, research projects, and educational programs, as well as our programs providing career and job search guidance.

Our REU programs have been very successful. We are assured of a continued REU program through the new DyDAn Center.

Our tutorial programs are a key to the success of the Center's programs. In general, we try to run these on a shoestring so that participants can come for relatively little expense. Some have suggested that these tutorials could be a source of revenue for the Center. We did experiment with a pricier shortcourse on health data privacy (HIPAA), but perhaps because of lack of experience in this direction, did not succeed in getting enough registrants to run it.

5. Concluding Remarks

The DIMACS initiatives launched in recent years are bearing fruit and expanding the scope of the Center. Indeed, the name "Center for Discrete Mathematics and Theoretical Computer Science" no longer fully describes our Center, but the name DIMACS has such widespread recognition and respect that the Executive Committee, Council and Advisory Board view it as an asset. Since the NSF STC award ended in January 2000, we have reinvented the Center and it is truly a resource for a growing community both within Rutgers and outside.

The effort to "redefine" DIMACS has not been an easy one. Without a large center grant like our founding STC award, management is required to expend a substantial amount of effort raising funds, in particular writing grant proposals. The financial viability of DIMACS depends to a large extent on the willingness of its management to devote this time. If we want to maintain the Center, we should make the funding structure more stable. We have made some progress, with a new infrastructure grant from NSF and infrastructure support in several other new grants. However, the fundamental issue remains. The current model of supporting the Center's research and education programs works, but it presents some challenges. The sheer variety of funding sources and time required to make so many grant applications and meet the subsequent reporting requirements presents a daunting task. The increased number of

projects running simultaneously has put a growing burden on management to juggle all of these topics and on the staff to deal with all of these activities.

There are valuable things that we could do with general center funding that we have had to limit under our current operating model. For instance, the STC award provided a substantial budget for postdoctoral fellows and long-term visitors. These people, at DIMACS for long periods of time, add dramatically to the life of the Center. Now we need to apply for individual grants for all of our programs, and it is difficult to find funds for postdocs and long-term visitors this way. Also, finding support for exploratory workshops, which are important in developing future Center programs and projects, is not easy without a "center" budget. Finally, program officers need to be repeatedly re-convinced that the DIMACS model of SF programs and workshops can lead to exciting new research achievements.

In spite of these challenges, DIMACS is thriving. Those who are involved with it give consistent praise to the opportunities the Center provides, and we continue to get very positive feedback from our local, national and international constituencies.

6. Supporting Materials (Appendices)

6.1 Grant History and Budget Summaries

Table 1: DIMACS Revenue Sources: 05/06 and Projected 06/07

	Actual	Projected
	2005/2006	2006/2007
Rutgers University		
Partial salary support and fringe for Director and staff	288,217	255,970
Academic Excellence Support for Joint DIMACS-CAIT Laboratory for Port Security	66,180	53,280
Grad student tuition support for Port-of Entry Inspection	13,502	25,085
DIMACS/IAS shared postdoc	29,862	29,862
Salary savings	57,450	54,025
External Grants:		
Department of Homeland Security		1,000,000
National Science Foundation	1,853,362	2,247,252
NIH (funded through NSF)	23,900	
Intelligence Community (funded through NSF)	404,972	322,379
Office of Naval Research	30,000	74,978
National Security Agency		15,000
UMDNJ (subaward of EPA grant)	25,002	25,002
Burroughs Wellcome Fund	10,000	
IBM (Intelligence Community Funds)	57,322	
Registration fees	65,310	75,000
ICR return	231,395	265,455
Partner and affiliate membership fees[1]	55,000	55,000
Industrial contributions to support workshops	55,000	15,000
Totals	3,266,474	4,513,288

Table 2: Projected 06/07 Operating Costs

Staff salary (Director's salary not included)	547,327
Fringe	161,183
Supplies, postage, software	40,000
Publicity, advertising	5,000
Publications	6,000
Telephone equipment and tolls	19,000
Equipment maintenance (photocopier & postage machine)	19,452
Equipment repair	4,000
Equipment replacement for visitor offices and staff	35,000
Total projected operating costs	836,962

[1] Industrial in-kind support was estimated at over $2M in a recent year.

Grant history and budget summaries for past 3 years and projections for 2006-07

	03/04	04/05	05/06	06/07
Federal Research Grants				
National Science Foundation	1,622,534	1,641,894	1,853,362	2,369,631
Intelligence Community (funds given to NSF)	887,982	143,700	404,972	
NIH (funds given to NSF)			23,900	
NSA				15,000
ONR		30,000	30,000	74,978
Homeland Security				1,000,000
Total Federal Grants	2,510,516	1,815,594	2,312,234	3,459,609
Industry			57,322	
Foundations			10,000	
Rutgers University		100,000	66,180	53,280
Total all grants	2,510,516	1,915,594	2,445,736	3,512,889

Note that the figures in each column do not count new grants coming in during that year, only grant funds becoming available in that year. In the past year, new grants received have totaled $6,466,137.

6.2 Research Project Statistics: Listings by Project Name, Title, Grant Agency, Etc.

	03/04	04/05	05/06	06/07
SGER: DIMACS Exploratory Postdoctoral Program in Computational Epidemiology NSF EIA 03-31486 4/15/03-4/30/04 (no-cost extension to 3/31/05) Total $100,000	100,000			
Construction of Low-Complexity, Capacity Achieving Code Families from Expander Graphs University of Maryland (subaward of NSF grant) 8/5/03-9/14/04; Total $40,911	40,911			
Workshop on Information Processing in the Biological Organism (November 4 - 5, 2003) NSF EIA 03-31276 5/1/03-4/30/04 (no-cost extension through 4/30/06) Total $56,609	56,509			
Conference on Linking Math and Biology in the High Schools NSF 04-25752; 9/15/04-8/31/05; Total $20,000		20,000		
Three Workshops in Data Analysis and Mining NSF CCR 03-20022 7/1/03-6/30/04 (no-cost extension through 6/30/05); Total $45,000	45,000			
Community Resources to Support Research in Automated Authorship Attribution (David Madigan, PI) NSF CNS 04-54126 7/15/05-6/30/06 (no-cost extension through 6/30/07) Total $56,019			56,019	
Workshop on Computational Geometry and Computer-Aided Design and Manufacturing NSF CCR 02-30858; 8/1/03-7/31/04; Total $19,200	19,200			
Special Year on Computational Information Theory and Coding NSF CCR 02-08577 7/1/02-6/30/04 (no-cost extension through 6/30/05) Yr 1 $106,448; Yr 2 $83,749; Total $190,197	83,749			
Three Special Focus Programs at DIMACS NSF CCR 00-87022 9/1/00-8/31/03 (no-cost extension through 8/31/07) Yr 1 $300,000; Yr 2 $300,000; Yr 3 $300,000 Total $900,000 Note: This is the parent grant under which we have received supplements for four separate and distinct projects which are listed immediately after this entry. The parent grant remains open as long as the supplements keep extending it.				
Three Special Focus Programs at DIMACS – supplement for Monitoring Message Streams (MMS) NSF CCR 00-87022; 7/1/02-8/31/07 Supplement #1 $350,580; #2 $228,459; #3 $120,961; #4 $304,451; #5 $287,400; #6 $143,700; #7 404,972; #8 $207,000; Total $2,047,523	287,400	143,700	404,972	322,379

	03/04	04/05	05/06	06/07
Three Special Focus Programs at DIMACS – supplement for the Bio-Math Connect Institute 2005 (BMCI '05) NSF CCR 00-87022 3/15/05-4/30/06 (no-cost extension through 8/31/07) Total $86,976		86,976		
Three Special Focus Programs at DIMACS – supplement for Author Identification project NSF CCR 00-87022; 3/1/04-12/31/04; Total $239,500	239,500			
Three Special Focus Programs at DIMACS – supplement for Knowledge Discovery: Mining Multilingual Resources Using Text Analysis NSF CCR 00-87022; 7/1/02-7/31/04 Supplement #1 $388,877; #2 $361,082; Total $749,959	361,082			
Knowledge Discovery and Dissemination (KDD) Challenge IBM contract number 2003 S518700 00 7/15/05-12/31/05 Total $57,322			57,322	
Travel Support for US Participation in Joint EU/NSF Strategic Workshops NSF EIA 01-34668 8/15/01-7/31/04 (no-cost extension through 12/31/07) Yr 1 $109,551; Yr. 2 $113,229; Yr 3 $121,272; Total $344,052	121,272			
Travel Support for US Participation in Joint EU/NSF Strategic Workshops – supplement for World Science Forum NSF EIA 01-34668; 8/1/05-7/31/06; Total $15,000			15,000	
Research Experiences for Undergraduates (REU) DIMACS/DIMATIA International REU Program NSF EIA-01-38973; 5/15/02-4/30/07 Yr 1 $218,233; Yr 2 $109,018; Yr 3 $109,018; Yr 4 $109,018; Yr 5 $109,018; Total $654,305	109,018	109,018	109,018	
U.S.-Czech-Hungarian Collaboration on Discrete Mathematics and Theoretical Computer Science Involving DIMACS-DIMATIA-Renyi Centers NSF INT 01-40431 7/1/02-6/30/05 (no-cost extension through 6/30/07) Yr 1 $51,983; Yr 2 $51,983; Yr 3 $51,983; Total $155,949	51,983	51,983		
ITR: Special Focus on Computer Science and Epidemiology NSF EIA 02-05116; 9/1/02-8/31/07; Yr 1 $545,387; Yr 2 $552,330; Yr 3 $553,436; Yr 4 $552,266; Yr 5 $546,581; Total $2,750,000	552,330	553,436	552,266	546,581
Satellite Reconnect Project NSF EIA 02-07338 7/15/02-6/30/06 (supplemental year 7/1/06-6/30/07) Yr 1 $86,955; Yr 2 $194,769; Yr 3 $188,177; Yr 4 $146,945; supplement Yr 5 $19,530; Total $636,376	194,769	188,177	146,945	19,530

	03/04	04/05	05/06	06/07
DIMACS Special Focus on Communication Security and Information Privacy NSF CCR 03-141618/15/03-7/31/06 (no-cost extension through 7/31/07) Yr 1 $125,000; Yr 2 $125,000; Yr 3 $100,000; Total $350,000	125,000	125,000	100,000	
Computer Science and Decision Theory: Applications of Notions of Consensus (LAMSADE) NSF INT 03-39067; 2/1/04-1/31/07 Yr 1 $23,738; Yr 2 $9,157; Yr 3 $6,105 Total $39,000	23,738	9,157	6,105	
DIMACS Special Focus on Computation and the Socio-Economic Sciences NSF SES 03-51165 4/1/04-3/31/07 Yr 1 $99,055; Yr 2 $73,057; Yr 3 $52,887; Total $224,999	99,055	73,057	52,887	
Special Focus on Information Processing in Biology NSF CCF 04-32013; 9/1/04-8/31/07 Yr 1 $195,000; Yr 2 $45,000; Yr 3 $45,000; Total $308,900		195,000	45,000	45,000
Special Focus on Information Processing in Biology – supplement for workshop on Computational Tumor Modeling NSF CCF 04-32013 (funds from NIH through NSF grant) 9/1/05-8/31/06; Total $23,900			23,900	
Algorithms for Port-of-Entry Inspection ONR N00014-05-1-0237; 2/1/05-1/31/07 Yr 1 $30,000; Yr 2 $30,000; Total $60,000		30,000	30,000	
D^3: New Directions, Dimensions, and Domains for Computer Science (Infrastructure) NSF CNS 05-13102; 6/1/05-5/31/10 Yr 1 $149,783; Yr 2 $155,775; Yr 3 $162,005; Yr 4 $168,484; Yr 5 $175,224; Total $811,271			149,783	155,775
D^3: New Directions, Dimensions, and Domains for Computer Science (Infrastructure): supplement for Insightful Understanding of China's Higher Education and Research in Computer Science and Information Technology NSF CNS 05-13102; 8/1/05-7/31/07; Total $125,000			125,000	
Workshops Connecting Theoretical CS to Other Fields NSF CCF 05-15703; 6/15/05-5/31/08 Yr 1 $100,000; Yr 2 $100,000; Yr 3 $100,000 Total $300,000		100,000	100,000	100,000
A Decision Logic Approach to the Port-of-Entry Inspection Problem NSF SES 05-18543; 9/15/05-8/31/08 Yr 1 $349,999; Yr 2 $125,000; Yr 3 $125,000 Total $599,999			349,999	125,000

	03/04	04/05	05/06	06/07
SGER: Connections Between Mathematics and Biology in the High Schools: An Experimental Program NSF ESI 04-21887; 8/1/04-7/31/05 (no-cost extension through 7/31/06) Total $130,090		130,090		
SGER: Connections Between Mathematics and Biology in the High Schools: An Experimental Program – supplement for BMCI 2006 NSF ESI 04-21887; 8/1/05-7/31/07; Total $45,340			45,340	
University-Industry Postdoctoral Fellow in Telecom/Combinatorics and Optimization NSF DMS 05-38432 09/01/06-08/31/08 Yr 1 $35,500; Yr 2 $35,500; Total $71,000				35,500
Workshop on Properties of Large Graphs: From Combinatorics to Statistical Physics and Back NSA H98230-06-1-061 8/18/06-8/17/07; Total $15,000				15,000
DIMACS/Georgia Tech Special Focus on Discrete Random Systems NSF DMS 06-02942; 8/1/06-7/31/08 Yr 1 $109,500; Yr 2 $82,000; Total $191,500				109,500
Facing the Challenge of Infectious Diseases in Africa: The Role of Mathematical Modeling: A Workshop NSF OISE 06-29714; 8/1/06-7/31/07; Total $81,746				81,746
The Bio-Math Connection NSF ESI 06-28091; 10/15/06-9/30/11 Yr 1 $554,369; Yr 2 $504,931; Yr 3 $655,383; Yr 4 $398,361; Yr 5 $346,957; Total $2,550,001				554,369
DNA Barcode Data Analysis Initiative: Tools for a New Generation of Biodiversity Data NSF DBI 06-29346; 9/1/06-8/31/07; Total $27,842				27,842
Mathematical Modeling of Infectious Diseases in Africa: A Shortcourse NSF ISE 06-29720; 9/1/06-8/31/07; Total $122,048				122,048
Workshop on Facing the Challenges of Infectious Diseases in Africa Burroughs Wellcome Fund, ID # 1006051 1/1/06-12/31/06 Total $10,000			10,000	
The Joint DIMACS CAIT Laboratory for Port Security (Tayfur Altiok, PI) Rutgers University Academic Excellence Fund 7/1/05-6/30/07 Yr 1 $66,180 Yr 2 $53,820; Total $120,000			66,180	53,280
The Bio-Math Connection (BMCI 2005) Rutgers University Academic Excellence Fund 4/1/05-3/31/07 Total $100,000		100,000		

	03/04	04/05	05/06	06/07
The Homeland Security Center for Dynamic Data Analysis (DyDAn) U.S. Dept. of Homeland Security; 1/1/07-12/31/09 Yr 1 $1,000,000; Yr 2 $1,000,000; Yr 3 $1,000,000; Total $3,000,000 Note: We have not received the official award document for this grant. However, the intent to award has been publicly announced by DHS.				1,000,000
Total grants	2,510,516	1,915,594	2,445,736	3,313,550

Pending Proposals:	06/07
Optimization Problems for Detection Systems ONR; 2/1/07-1/31/10 Yr 1 $74,978; Yr 2 $74,963; Yr 3 $74,922; Total $224,863	74,978
REU Site: DIMACS/DIMATIA U.S./Czech International REU Program NSF; 5/1/07-4/30/10 Yr 1 $124,361; Yr 2 $129,362; Yr 3 $134,536; Total $388,259	124,361
DIMACS Workshop on Algorithmic Challenges in Optimization, Game Theory, and Computer Science (in honor of Leonid Khachiyan (1952-2005) NSA; 10/1/07-9/30/08 Total $15,000	
Total pending 06/07 grants	199,339

6.3 Publications

AMS/DIMACS Book Series, Published by the American Mathematical Society:

- *Volume One:* "Polyhedral Combinatorics," Editors: William Cook and Paul D. Seymour, 1990
- *Volume Two:* "Distributed Computing and Cryptography," Editors: Joan Feigenbaum and Michael Merritt, 1991
- *Volume Three:* "Computer-aided Verification '90," Editors: E.M. Clarke and R.P. Kurshan, 1991
- *Volume Four:* "Applied Geometry and Discrete Mathematics," Editors: Peter Gritzmann and Bernd Sturmfels, 1991
- *Volume Five:* "Reliability of Computer and Communication Networks," Editors: Fred Roberts, Frank Hwang and Clyde Monma, 1991
- *Volume Six:* "Discrete and Computational Geometry: Papers from the DIMACS Special Year," Editors: Jacob E. Goodman, Richard Pollack and William Steiger, 1991
- *Volume Seven:* "On-line Algorithms," Editors: Lyle A. McGeoch and Daniel D. Sleator, 1992
- *Volume Eight:* "Mathematical Methods of Analysis of Biopolymer Sequences," Editor: Simon Gindikin, 1992
- *Volume Nine:* "Planar Graphs," Editor: William T. Trotter, 1993
- *Volume Ten:* "Expanding Graphs," Editor: Joel Friedman, 1993
- *Volume Eleven:* "Groups and Computation," Editors: Larry Finkelstein, William M. Kantor, 1993
- *Volume Twelve:* "Network Flows and Matching: First DIMACS Implementation Challenge," Editors: David S. Johnson, Catherine C. McGeoch, 1993
- *Volume Thirteen:* "Advances in Computational Complexity Theory," Editor: Jin-Yi Cai, 1993
- *Volume Fourteen:* "Coding and Quantization," Editors: Robert Calderbank, G. David Forney, Jr., Nader Moayeri, 1993
- *Volume Fifteen:* "Computational Support for Discrete Mathematics," Editors: Nathaniel Dean, Gregory E. Shannon, 1994
- *Volume Sixteen:* "Quadratic Assignment and Related Problems," Editors: Panos M. Pardalos and Henry Wolkowicz, 1994
- *Volume Seventeen:* "Language Computations," Editors: Eric Sven Ristad, 1994
- *Volume Eighteen:* "Specification of Parallel Algorithms," Editors: Guy E. Blelloch, K. Mani Chandy, Suresh Jagannathan, 1994
- *Volume Nineteen:* "Partitioning Data Sets," Editors: Ingemar Cox, Pierre Hansen, Bela Julesz, 1995
- *Volume Twenty:* "Combinatorial Optimization," Editors: William Cook, Laszlo Lovasz, Paul Seymour, 1995
- *Volume Twenty One:* "Workshop on Interconnection Networks and Mapping and Scheduling Parallel Computations," Editors: D. Frank Hsu, Arnold L. Rosenberg, Dominique Sotteau, 1995
- *Volume Twenty Two:* "Workshop on Parellel Processing of Discrete Optimization Problems," Editors: Panos M. Pardalos, Mauricio G.C. Resende, K.G. Ramakrishnan, 1995
- *Volume Twenty Three:* "Global Minimization of Nonconvex Energy Functions: Molecular Conformation and Protein Folding," Editors: P.M. Pardalos, D. Shalloway, and G. Xue, 1996
- *Volume Twenty Four:* "Formal Power Series and Algebraic Combinatorics - Series Formalles et Combinatoire Algebrique," Editors: Louis Billera, Curtis Greene, Rodica Simion, and Richard Stanley, 1996
- *Volume Twenty Five:* "Geometric and Computational Perspectives on Infinite Groups - Proceedings of a Joint DIMACS/Geometry Center Workshop January 3-14 and March 17-20, 1994," Editors: Gilbert Baumslag, David Epstein, Robert Gilman, Hamish Short, and Charles Sims, 1996
- *Volume Twenty Six:* "Cliques, Coloring and Satisfiability: Second DIMACS Implementation Challenge," Editors: David S. Johnson and Michael A. Trick, 1996
- *Volume Twenty Seven:* "DNA Based Computers - Proceedings of a DIMACS Workshop, April 4, 1995," Editors: Richard J Lipton and Eric B. Baum, 1996
- *Volume Twenty Eight:* "Groups and Computation II - Workshop in Groups and Computation, June 7-10, 1996," Editors: Larry Finkelstein and William Kantor, 1997
- *Volume Twenty Nine:* "Partial Order Methods in Verification: DIMACS Workshop, July 24-26, 1996," Editors: Doron A. Peled, Vaughan R. Pratt, and Gerard J. Holzmann, 1997
- *Volume Thirty:* "Parallel Algorithms: Third DIMACS Implementation Challenge, October 17-19, 1994," Editor: Sandeep N. Bhatt, 1997

- *Volume Thirty One:* "Descriptive Complexity and Finite Models: Proceedings of a DIMACS Workshop, January 14-17, 1996," Editors: Neil Immerman and Phokion G. Kolaitis, 1997
- *Volume Thirty Two:* "The SPIN Verification System: The Second Workshop on the SPIN Verification System Proceedings of a DIMACS Workshop August 5, 1996," Editors: Jean-Charles Gregoire, Gerard J. Holzmann, Doron A, Peled, 1997
- *Volume Thirty Three:* "Logic and Random Structures," Editors: Ravi Boppana and James Lynch, 1997
- *Volume Thirty Four:* "African Americans in Mathematics," Editor: Nathaniel Dean, 1997
- *Volume Thirty Five:* "Satisfiability Problem: Theory and Applications," Editors: Dingzhu Du, Jun Gu, and Panos M. Pardalos, 1997
- *Volume Thirty Six:* "Discrete Mathematics in the Schools," Editors: Joseph G. Rosenstein, Deborah S. Franzblau, Fred S. Roberts, 1997
- *Volume Thirty Seven:* "Mathematical Hierarchies and Biology," Editors: Boris Mirkin, F. R. McMorris, Fred S. Roberts and Andrey Rzhetsky, 1997
- *Volume Thirty Eight:* "Network Threats," Editors: Rebecca N. Wright and Peter G. Neumann, 1998
- *Volume Thirty Nine:* "Proof Complexity and Feasible Arithmetics," Editors: P. Beame and S. Buss, 1998
- *Volume Forty:* "Network Design: Connectivity and Facilities Location," Editors: Panos M. Pardalos and Dingzhu Du, 1998
- *Volume Forty One:* "Microsurveys in Discrete Probability," Editors: David Aldous and James Propp, 1998
- *Volume Forty Two:* "Advances in Switching Networks," Editors: Ding-Zhu Du and Frank K. Hwang, 1998
- *Volume Forty Three:* "Randomization Methods in Algorithm Design," Editors: Panos Pardalos and Sanguthevar Rajasekaran, 1999
- *Volume Forty Four:* "DNA Based Computers II," Editors: Laura Landweber and Eric Baum, 1999
- *Volume Forty Five:* "Networks in Distributed Computing," Editors: Marios Mavronicolas, Michael Merritt and Nir Shavitt, 1999
- *Volume Forty Six:* "Multichannel Optical Networks: Theory and Practice," Editors: Peng-Jun Wan, Ding-Zhu Du, Panos M. Pardalos, 1999
- *Volume Forty Seven:* "Mathematical Support for Molecular Biology," Editors: Martin Farach-Colton, Fred S. Roberts, Martin Vingron and Michael Waterman, 1999
- *Volume Forty Eight:* "DNA Based Computers III," Editors: Harvey Rubin and David Harlan Wood, 1999
- *Volume Forty Nine:* "Contemporary Trends in Discrete Mathematics: From DIMACS and DIMATIA to the Future," Editors: Ronald L. Graham, Jan Kratochvil, Jaroslav Nesetril and Fred S. Roberts, 1999
- *Volume Fifty:* "External Memory Algorithms," Editors: James M. Abello and Jeffrey Scott Vitter, 1999
- *Volume Fifty One:* "Discrete Mathematical Chemistry," Editors: Pierre Hansen, Patrick Fowler and Maolin Zheng, 2000
- *Volume Fifty Two:* "Mobile Networks and Computing," Editors: Sanguthevar Rajasekaran, Panos Pardalos and D. Frank Hsu, 2000
- *Volume Fifty Three:* "Robust Communication Networks: Interconnection and Survivability," Editors: Nathaniel Dean, D. Frank Hsu and R. Rav, 2000
- *Volume Fifty Four:* "DNA Based Computers V," Editors: Erik Winfree and David K. Gifford, 2000
- *Volume Fifty Five:* "Discrete Mathematical Problems with Medical Applications," Editors: Ding-Zhu Du, Panos M. Pardalos, and Jie Wang, 2000
- *Volume Fifty Six:* "Codes and Association Schemes," Editors: Alexander Barg and Simon Litsyn, 2001
- *Volume Fifty Seven:* "Constraint Programming and Large Scale Discrete Optimization," Editors: Eugene C. Freuder and Richard J. Wallace, 2001
- *Volume Fifty Eight:* "Set Theory: The Hajnal Conference, October 15 - 17, 1999," Editor: Simon Thomas, 2002
- *Volume Fifty Nine:* "Data Structures, Near Neighbor Searches, and Methodology: Fifth and Sixth DIMACS Implementation Challenges," Editors: Michael H. Goldwasser, David S. Johnson and Catherine C. McGeoch, 2002
- *Volume Sixty:* "Algorithmic and Quantitative Real Algebraic Geometry," Editors: Saugata Basu and Laureano Gonzalez-Vega, 2003
- *Volume Sixty One:* "Bioconsensus," Editors: M. F. Janowitz, F.-J. Lapointe, F. R. McMorris and F. S. Roberts, 2003
- *Volume Sixty Two:* "Multiantenna Channels: Capacity, Coding and Signal Processing," Editors: Gerard J. Foschini and Sergio Verdú, 2003

- *Volume Sixty Three:* "Graphs, Morphisms and Statistical Physics," Editors: Jaroslav Nesetril & Peter Winkler, 2004
- *Volume Sixty Four:* "Unusual Applications of Number Theory," Editor: Melvyn B. Nathanson, 2004
- *Volume Sixty Five:* "The Random Projection Method," Author: Santosh S. Vempala, 2004
- *Volume Sixty Six:* "Advances in Network Information Theory," Editors: Piyush Gupta, Gerhard Kramer, and Adriaan J. van Wijnggaarden, 2004
- *Volume Sixty Seven:* "Geometric and Algorithmic Aspects of Computer-Aided Design and Manufacturing," Editors: Ravi Janardan, Michiel Smid, and Debasis Dutta, 2005
- *Volume Sixty Eight:* "Algebraic Coding Theory and Information Theory," Editors: A. Ashikhmin and A. Barg, 2005
- *Volume Sixty Nine:* "Graphs and Discovery," Editors: Siemion Fajtlowicz, Patrick W. Fowler, Pierre Hansen, Melvin F. Janowitz and Fred S. Roberts, 2005.
- *Volume Seventy:* "Discrete Methods in Epidemiology," Editors: James Abello and Graham Cormode, 2005.
- *Volume Seventy One:* "Disease Evolution: Models, Concepts, and Data Analysis," Editors: Zhilan Feng, Ulf Dieckmann, Simon Levin, 2006.

DIMACS Technical Reports (Listing by Year):

Listing of Technical Reports published in 2004:

- 2004-01: On the Complexities of Some Combinatorial Problems in Reverse Engineering of Protein and Gene Networks by Piotr Berman, Bhaskar DasGupta and Eduardo Sontag
- 2004-02: A Study of K-Means Clustering for Improving Classification Accuracy of Multi-Class SVM by Dmitriy Fradkin and Ilya Muchnik
- 2004-03: Recognizing *k*-Complete Bipartite Bihypergraphs by I. E. Zverovich and I. I. Zverovich
- 2004-04: Generalizations of Interval-Filament Graphs by Fanica Gavril
- 2004-05: A Combinatorial Strongly Subexponential Strategy Improvement Algorithm for Mean Payoff Games by Henrik Bjorklund, Sven Sandberg and Sergei Vorobyov
- 2004-06: War and Peace in Veto Voting by Vladimir Gurvich
- 2004-07: Finding Central Sets of Tree Structures in Synchronous Distributed Systems by Jonathan W. Berry, Daniel Hrozencik, Shrisha Rao and Zhizhang Shen
- 2004-08: Simultaneous Feature Selection And Margin Maximization Using Saddle Point Approach by Yuri Goncharov, Ilya Muchnik and Leonid Shvartser
- 2004-09: Randomized Subexponential Algorithms for Infinite Games by Henrik Bjorklund, Sven Sandberg and Sergei Vorobyov
- 2004-10: Randomized Approximation Algorithms for Set Multicover Problems with Applications to Reverse Engineering of Protein and Gene Networks by Piotr Berman, Bhaskar DasGupta and Eduardo Sontag
- 2004-11: The Hardness of the Lemmings Game by Graham Cormode
- 2004-12: How to Increase the Acceptance Ratios of Top Conferences by Graham Cormode, Artur Czumaj and S. Muthukrishnan
- 2004-13: Pair Approximation of the Stochastic Susceptible-Infected-Recovered-Susceptible Epidemic Model on the Hypercubic Lattice by Jaewook Joo and Joel L. Lebowitz
- 2004-14: Behavior of *SIS* Epidemics on Heterogeneous Networks with Saturation by Jaewook Joo and Joel Lebowitz
- 2004-15: A Tutorial on Monotone Systems with an Application to Chemical Reaction Networks by P. De Leenheer, D. Angeli and E.D. Sontag
- 2004-16: Monotone Chemical Reaction Networks by P. De Leenheer, D. Angeli and E.D. Sontag
- 2004-17: Further Analysis of the Number of Spanning Trees in Circulant Graphs by Talip Atajan, Xuerong Yong and Hiroshi Inaba
- 2004-18: The Number of Spanning Trees in Circulant Graphs with Non-Fixed Jumps by Yuanping Zhang, Zhiyong Zhang and Xuerong Yong
- 2004-19: The Relative Clique-Width of a Graph by Vadim V. Lozin and Dieter Rautenbach
- 2004-20: Subject Allocation and Study Curtailment for Fixed Event Comparative Poisson Trials by Donald R. Hoover

- 2004-21: A Framework for Reducing Comparisons in Heap Operations by Amr Elmasry
- 2004-22: A Degree Constraint for Uniquely Hamiltonian Graphs by Sarmad Abbasi and Asif Jamshed
- 2004-23: Protecting (even) Naive Web Users, or: Preventing Spoofing and Establishing Credentials of Web Sites by Amir Herzberg and Ahmad Gbara
- 2004-24: Network Augmentation for Confluent Flow in Data Networks by Randeep Bhatia, Nicole Immorlica, Tracy Kimbrel, Vahab S. Mirrokni, Joseph (Seffi) Naor and Baruch Schieber
- 2004-25: Workload-Optimal Wavelet Synposis by S. Muthukrishnan
- 2004-26: Maximal Induced Matchings of Minimum/Maximum Size by Yury L. Orlovich and Igor E. Zverovich
- 2004-27: Medical Expenditures During The Last Year On Life: Findings From The 1992-96 Medicare Current Beneficiary Survey by Donald R. Hoover, Stephen Crystal, Rizie Kumar, Usha Sambamoorthi and Joel C. Cantor
- 2004-28: Location Streams: Models and Algorithms by M. Hoffmann, S. Muthukrishnan and Rajeev Raman
- 2004-29: A Note on a Monotone Small Gain Theorem, with Applications to Delay Systems by German A. Enciso and Eduardo D. Sontag
- 2004-30: k-Interval-Filament Graphs by Fanica Gavril
- 2004-31: A Global Parallel Algorithm for Finding All Minimal Transversals of Hypergraphs of Bounded Edge-Size by E. Boros, K. Elbassioni, V. Gurvich and L. Khachiyan
- 2004-32: Controlling Spam by Secure Internet Content Selection by Amir Herzberg
- 2004-33: Automatic Screening for Groups of Orthologous Genes in Comparative Genomics Using Multiple-Component Clustering by Akshay Vashist, Casimir A. Kulikowski, Ilya Muchnik
- 2004-34: On Hamiltonicity Of Claw- And Net-Free Graphs by Alexander Kelmans
- 2004-35: On Claw- And Net-Free Graphs by Alexander Kelmans
- 2004-36: A Note on the Monotonicity of Matrix Riccati Equations by Patrick De Leenheer and Eduardo Sontag
- 2004-37: Report on DIMACS Working Group Meeting: Data Mining and Epidemiology, March 18-19, 2004 by James Abello and Graham Cormode
- 2004-38: Verification of Minimum-Redundancy Prefix Codes by Ahmed Belal and Amr Elmasry
- 2004-39: Distribution-Sensitive Priority Queues by Amr Elmasry
- 2004-40: Category-Based Feature Extraction in Supervised Categorization of Aviation Safety Report System Documents by Yangzhe Xiao, Haym Hirsh, Casimir Kulikowski, Michael Littman and Ilya Muchnik
- 2004-41: The Controlled Linear Programming Problem by Henrik Bjorklund, Olle Nilsson, Ola Svensson and Sergei Vorobyov
- 2004-42: Nonuniform Sparse Approximation with Haar Wavelet Basis by S. Muthukrishnan
- 2004-43: On Critical Trees Labeled with a Condition at Distance Two by Denise Sakai Troxell
- 2004-44: Computing Many Maximal Independent Sets for Hypergraphs in Parallel by Endre Boros, Khaled Elbassioni, Vladimir Gurvich and Leonid Khachiyan
- 2004-45: A Computational Study of the Broadcast Domination Problem by Steven B. Horton, Claudio N. Meneses, Arup Mukherjee and M. Erol Ulucakli
- 2004-46: Tight Bounds on Deterministic Seed Design by Martin Farach-Colton, Gad M. Landau, S. Cenk Sahinalp and Dekel Tsur
- 2004-47: Principles of Nonstationary Regression Estimation: A New Approach to Dynamic Multi-Factor Models in Finance by Michael Markov, Vadim Mottl and Ilya Muchnik
- 2004-48: Three Optimal Algorithms for Balls of Three Colors by Zdenek Dvorak, Vit Jelinek, Daniel Kral, Jan Kyncl and Michael Saks
- 2004-49: Improved Time Bounds for Near-Optimal Sparse Fourier Representations by Anna C. Gilbert, S. Muthukrishnan, and Martin J. Strauss
- 2004-50: On the Realizability of Point Processes with Specified One and Two Particle Densities by Joel L. Lebowitz, O. Costin, T. Kuna and E.R. Speer
- 2004-51: A $O(n^2)$ Lower Bound for Swaping the Order of *n* Input Bits in Planar Boolean Circuits by Bin Tian
- 2004-52: Approximate Histogram and Wavelet Summaries of Streaming Data by S. Muthukrishan and Martin J. Strauss
- 2004-53: Optimal Mapping of Deep Gray Scale Images to a Coarser Scale of Gray by Solomon Borodkin, Aleksey Borodkin and Ilya Muchnik
- 2004-54: Initiation of Colorectal Cancer: Where Do theTwo Hits Hit? by Natalia L. Komarova and Liming Wang

- 2004-55: Optimal Protein Encoding by Logan Everett and Endre Boros
- 2004-56: Controlled Linear Programming: Duality and Boundedness by Henrik Bjorklund, Olle Nilsson, Ola Svensson and Sergei Vorobyov
- 2004-57: Does Wee1 Inhibit the Entry to M Phase? by Liming Wang

Listing of Technical Reports published in 2005:

- 2005-01: Exploration Approaches to Adaptive Filtering by Dmitriy Fradkin and Michael Littman
- 2005-02: Integer Programming Methods for Several Optimization Problems in Graph Theory by Jamiru Luttamaguzi, Michael Pelsmajer, Zhizhang Shen and Boting Yang
- 2005-03: Modeling Continuous Positive and Negative Reasons in Decision Aiding by Meltem Ozturk and Alexis Tsoukias
- 2005-04: Extending Dijkstra's Algorithm to Shortest Paths with Blocks by Jihui Zhao, Vladimir Gurvich and Leonid Khachiyan
- 2005-05: Linear Complementarity Algorithms for Mean Payoff Games by Henrik Bjorklund, Ola Svensson and Sergei Vorobyov
- 2005-06: Even-Hole-Free and Balanced Circulants by Diogo Andrade, Endre Boros and Vladimir Gurvich
- 2005-07: On the Misere Version of Game Euclid and Miserable Games by Vladimir Gurvich
- 2005-08: Cyclically Orientable Graphs by Vladimir Gurvich
- 2005-09: Approximation of the Quadratic Set Covering Problem by Bruno Escoffier and Peter L. Hammer
- 2005-10: Mental Illness and Length of Hospital Stay for Medicaid Inpatients Infected with HIV by Donald R. Hoover, Usha Sambamoorthi, James T. Walkup and Stephen Crystal
- 2005-11: Summarizing and Mining Inverse Distributions on Data Streams via Dynamic Inverse Sampling by Graham Cormode, S. Muthukrishnan and Irina Rozenbaum
- 2005-12: Generating All Minimal Integral Solutions to AND-OR Systems of Monotone Inequalities: Conjunctions are Easier than Disjunctions by Endre Boros, Khaled Elbassioni, Vladimir Gurvich and Leonid Khachiyan
- 2005-13: Controlled Linear Programming for Infinite Games by Henrik Bjorklund, Ola Svensson and Sergei Vorobyov
- 2005-14: Inapproximability Results for the Lateral Gene Transfer Problem by Bhaskar Dasgupta, Sergio Ferrarini, Uthra Gopalakrishnan and Nisha Raj Paryani
- 2005-15: Santa Claus' Towers of Hanoi by Xiaomin Chen, Bin Tian and Lei Wang
- 2005-16: Extending Power and Sample Size Approaches for McNemar's Procedure to General Sign Tests by Donald R. Hoover
- 2005-17: Maximal Independent Sets In Graphs With At Most *r* Cycles by Goh Chee Ying, Koh Khee Meng, Bruce E. Sagan and Vincent R. Vatter
- 2005-18: Maximal and Maximum Independent Sets In Graphs With At Most *r* Cycles by Bruce E. Sagan and Vincent R. Vatter
- 2005-19: Workload-Optimal Histograms on Streams by S. Muthukrishnan, Martin J. Strauss and Xuan Zheng
- 2005-20: A Subexponential Algorithm for a Subclass of P-Matrix Generalized Linear Complementarity Problems by Ola Svensson and Sergei Vorobyov
- 2005-21: Generating All Vertices of a Polyhedron is Hard by Leonid Khachiyan, Endre Boros, Konrad Borys, Khaled Elbassioni and Vladimir Gurvich
- 2005-22: The Nagger-Mover Game by Z. Nedev and S. Muthukrishnan
- 2005-23: Fractional Firefighting in the Two Dimensional Grid by K. L. Ng and P. Raff
- 2005-24: Enumerating Cut Conjunctions in Graphs and Related Problems by Leonid Khachiyan, Endre Boros, Konrad Borys, Khaled Elbassioni, Vladimir Gurvich and Kazuhisa Makino
- 2005-25: Towards an Algorithmic Theory of Compressed Sensing by Graham Cormode and S. Muthukrishnan
- 2005-26: Critical Groups in Dynamic Social Networks by Tanya Y Berger-Wolf and Jared Saia
- 2005-27: Combinatorial Reconstruction of Sibling Relationships in Absence of Parental Data by Tanya Y. Berger-Wolf, Bhaskar DasGupta, Wanpracha Chaovalitwongse and Mary V. Ashley
- 2005-28: A Framework for Analysis of Dynamic Social Networks by Tanya Y. Berger-Wolf and Jared Saia
- 2005-29: Universal Subsets of Zn, Linear Integer Optimization, and Integer Factorization by Zhivko Nedev

- 2005-30: Upper Bound on the Number of Vertices of Polyhedra with *0,1*-Constraint Matrices by Khaled Elbassioni, Zvi Lotker and Raimund Seidel
- 2005-32: Decoding of Expander Codes at Rates Close to Capacity by Alexei Ashikhmin and Vitaly Skachek
- 2005-33: Estimating Entropy and Entropy Norm on Data Streams by Amit Chakrabarti, Khanh Do Ba and S. Muthukrishnan
- 2005-34: Monge Property and Bounding Multivariate Probability Distribution Functions with Given Marginals and Covariances by Xiaoling Hou and Andras Prekopa
- 2005-35: Machine Learning Methods in the Analysis of Lung Cancer Survival Data by Dmitriy Fradkin, Dona Schneider and Ilya Muchnik
- 2005-38: A Polynomial Algorithm to Find an Independent Set of Maximum Weight in a Fork-Free Graph by Vadim V. Lozin and Martin Milanic
- 2005-39: An Evaluation of the Edit-Distance-with-Moves Similarity Metric for Comparing Genetic Sequences by Shiri Azenkot, Tzu-Yi Chen and Graham Cormode
- 2005-40: Combinatorial Algorithms for Compressed Sensing by Graham Cormode and S. Muthukrishnan
- 2005-41: Inferring (Biological) Signal Transduction Networks via Binary Transitive Reductions by Reka Albert, Bhaskar DasGupta, Riccardo Dondi and Eduardo Sontag
- 2005-42: Simulated Entity Resolution by Diverse Means: DIMACS Work on the KDD Challenge of 2005 by Andrei Anghelescu, Aynur Dayanik, Dmitriy Fradkin, Alex Genkin, Paul Kantor, David Lewis, David Madigan, Ilya Muchnik and Fred Roberts
- 2005-43: Interactive Navigation of Power-Law Graphs by James Abello and Frank van Ham

Listing of Technical Reports published in 2006 (to date):

- 2006-01: On the Complexity of Monotone Boolean Duality Testing by Khaled M. Elbassioni
- 2006-02: The Paradoxical Nature of Locating Sensors in Paths and Cycles: The Case of 2-Identifying Codes by David L. Roberts and Fred S. Roberts
- 2006-03: An Exact Algorithm for MAX-CUT in Sparse Graphs by F. Della Croce, M. J. Kaminski and V. Th. Paschos
- 2006-04: Polynomial Time Algorithm for Column-Row Based Relative-Error Low-Rank Matrix Approximation by Petros Drineas, Michael W. Mahoney and S. Muthukrishnan
- 2006-05: Experimental Analysis of Sequential Decision Making Algorithms for Port of Entry Inspection Procedures by Saket Anand, David Madigan, Richard Mammone, Saumitr Pathak and Fred Roberts
- 2006-09: Probabilistic Distance Clustering by Adi Ben-Israel and Cem Iyigun
- 2006-10: Finding Max-Cliques in Power-Law Graphs with Large Clique Coefficients by James Abello and Michael Capalbo
- 2006-12: Generating 3-Vertex Connected Spanning Subgraphs by Endre Boros, Konrad Borys, Vladimir Gurvich and Gabor Rudolf
- 2006-13: Inapproximability Bounds for Shortest-Path Network Interdiction Problems by Endre Boros, Konrad Borys, Vladimir Gurvich and Gabor Rudolf
- 2006-14: An Efficient Optimal-Equilibrium Algorithm for Two-Player Game Trees by Michael L. Littman, Nishkam Ravi, Arjun Talwar and Martin Zinkevich
- 2006-15: Polynomial-Time Algorithm for Vertex k-Colorability of P5-Free Graphs by Marcin Kaminski and Vadim Lozin
- 2006-16: On Graphs Whose Maximal Cliques and Stable Sets Intersect by Diogo V. Andrade, Endre Boros and Vladimir Gurvich
- 2006-17: On the Complexity of the Exact Weighted Independent Set Problem for Various Graph Classes by Martin Milanic and Jerome Monnot
- 2006-18: Proper Partitions of a Polygon and *k*-Catalan Numbers by Bruce E. Sagan

DIMACS Educational Module Series:

03-1: Introduction to Clustering Algorithms: Hierarchical Clustering
Alexander Kheyfits, Bronx Community College (CUNY)

03-2: Facility Location Problems
R. S. (Chuck) Tiberio, Wellesley High School

03-3: Security Cameras and Floodlight Illumination
Allison Wolf, Edgewood College; Lidia Luquet, St. Mary's College; Nancy Hagelgans, Ursinus College; Marjorie Darrah, Alderson-Broaddus College

03-4: Planar Linkages: Robot Arms and Carpenter's Rulers
Nancy Lineken Hagelgans, Ursinus College

03-5: Communications Network Design
Steven Cosares, Hofstra University; Fred Rispoli, Dowling College

03-7: A Gentle Introduction to Mathematical Cluster Analysis
Harel Barzilai, Salisbury University; Kathy Andrews, Hillsdale College; Alexander Kheyfits, Bronx Community College (CUNY)

04-1: Probability and Chip Firing Games
Lynne L. Doty, Marist College; K. Peter Krog, Marist College; Tracey Baldwin McGrail, Marist College

04-2: Modeling Traffic Jams with Cellular Automata
Stephanie Edwards, University of Dayton; Mark Ginn, Appalachian State University; John Harris, Furman University; Greg Rhoads, Appalachian State University

04-3: IN DISCRETE MATHEMATICS: Using Discrete Mathematics in the Classroom
Joseph Rosenstein, Rutgers University; Deborah S. Franzblau, CUNY / College of Staten Island; Robert Hochberg, East Carolina University

06-1: Some Problems are NP-harder than Others
Sally Cockburn, Hamilton College; Ben Coleman, Moravian College; R. Bruce Mattingly, SUNY Cortland; Kay Somers, Moravian College

6.4 Student Participation in Programs and Projects

DIMACS/Math REU 2005 Participants

Participant	Program	Project	Mentor
Jonathan Bergknoff Cornell University	Math REU	Ionization of a Two-Level system	Joel Lebowitz Department of Mathematics
*Sarah Bleiler Seton Hall University	DIMACS REU	Applications of the Maximum Independent Set Problem	Vadim Lozin RUTCOR
*Craig Bowles Cornell University	DIMACS REU	Non-Clairvoyant Job Scheduling	S. Muthukrishnan Department of Computer Science
Jordanna Chord Gonzaga University	DIMACS REU	Author Identification Challenge	Paul Kantor SCILS
Josef Cibulka Charles University	DIMACS REU	Planarity Testing	Eric Allender Department of Computer Science Jeff Kahn Department of Mathematics
Kathryn Davidson University of Pennsylvania	DIMACS REU	Feature Selection and Error Tolerance for the Logical Analysis of Data	Endre Boros, Vladimir Gurvich RUTCOR
Khanh Do_Ba Dartmouth College	DIMACS REU	Estimating Entropy and Entropy Norm on Data Streams	S. Muthukrishnan Department of Computer Science
Elizabeth Hayden Coe College	DIMACS REU	How to Generate Short Paths	Vladimir Gurvich, Endre Boros RUTCOR
Jan Hladky Charles University	DIMACS REU	Planarity Testing	Eric Allender Department of Computer Science Jeff Kahn Department of Mathematics
Abhinav Jha Rutgers University	DIMACS REU	Marine Logistics: Crude Oil Transportation	Wanpracha Chaovalitwongse Department of Industrial Engineering
Aziza Jefferson Rutgers University	Math REU	Testing Models of Virus Capsids Using Emerging and Re-Emerging Viruses	Stanley Dunn Department of Biomedical Engineering
Marek Krcal Charles University	DIMACS REU	Planarity Testing	Eric Allender Department of Computer Science Jeff Kahn Department of Mathematics

Shana Lieberman Goucher College	Math REU	Connections Constants in Differential Systems	Ovidiu and Rodica Costin Department of Mathematics
Yi Lin Emory University	DIMACS REU	A Discrete Representation of DNA Base Pair Steps	Wilma Olson Department of Chemistry
Karen Lostritto Brown University	DIMACS REU	Eulerian Graph Representation for siRNA Sequence Structure	Stanley Dunn Department of Biomedical Engineering
Daniel MacDonald Seton Hall University	DIMACS REU	Generation of Shortest Paths and Minimal Cutsets	Endre Boros, Vladimir Gurvich RUTCOR
Alekzander Malcom University of Texas at Arlington	Math REU	Error Bounds for the Approximation to Solutions of the Schrodinger Equation	Avy Soffer Department of Mathematics
Jessica McCoy North Carolina State University	DIMACS REU	Flight Scheduling	Wanpracha Chaovalitwongse Department of Industrial Engineering
Matthew Meola Rutgers University	Math REU	A Study of Knot and Tangle Invariants	Chris Woodward Department of Mathematics
*Melissa Mitchell University of Detroit - Mercy	DIMACS REU	Author Identification	Paul Kantor SCILS
*Samuel Nelson Bucknell University	DIMACS REU	Claw-Free Graphs	Vadim Lozin RUTCOR
Andrew Rodriguez University of Texas at San Antonio	DIMACS/RISE	Experimental Evaluation of Hop-optimal Networks in the Weak Sensor Model	Martin Farach Department of Computer Science
Jennifer Staigar Rutgers University	Math REU	Tensor Decomposition of Microarray Data	Stanley Dunn Department of Biomedical Engineering
Charles Siegel Rutgers University	Math REU	Error Analysis in PDEs	Avy Soffer Math Department
*Arjun Talwar Stanford University	DIMACS REU	Two Player Games	Michael Littman Department of Computer Science
Joseph Walsh Rutgers University	Math REU	A Study of Knot and Tangle Invariants	Chris Woodward Department of Mathematics

The * indicates students who traveled to DIMATIA, Prague, Czech Republic (July 23 - August 10, 2005).

Graduate Student Coordinators
Martin Balek Charles University
Lara Pudwell Rutgers University

DIMACS/Math REU 2006 Participants

Participant	Program	Project	Mentor
Michael Burger Rutgers University	Math REU	Polynomial Equations over Matrices	Robert Wilson Department of Mathematics
Josef Cibulka Charles University	DIMACS REU	The Pinning Number of Overlapping Rectangles	Mario Szegedy Department of Computer Science Rados Radoicic Math Department
* Natalia Cordova University of Puerto Rico	DIMACS/RISE REU	The *Nagger-Mover* Game	S. Muthukrishnan Department of Computer Science
Judy Davidson Rutgers University	DIMACS REU	Inference on Small Samples	John Kolassa Department of Statistics
Jai Dhyani McDaniel College	DIMACS REU	Mathematical Programming Models for Data Mining Tasks	Art Chaovalitwongse Department of Industrial Engineering
Steven Dubey Columbia University	DIMACS/Math REU	KITTY: Numerical Solution to the Time-Dependent Nonlinear Schrodinger Equation	Avy Soffer Chris Stucchio Department of Mathematics
Anna Fuller University of California, Berkeley	Math REU	Polytopes Involving Symplectic Geometry and Homotopy Theory	Chris Woodward Department of Mathematics
Rodney Gateau Rutgers University	Math REU	KITTY: Numerical Solution to the Time-Dependence Nonlinear Schrodinger Equation	Avy Soffer Chris Stucchio Department of Mathematics
* Elizabeth Gillaspy Macalester College	DIMACS REU	Firefighting on Graphs	Kah Loon Ng DIMACS

Jan Hladký Charles University	DIMACS REU	The Pinning Number of Overlapping Rectangles	Mario Szegedy Department of Computer Science Rados Radoicic Department of Mathematics
Ilia Izmailov Princeton University	DIMACS REU	Finding a Maximal Independent Set of Vertices	Vadim Lozin RUTCOR
Alexandr Kazda Charles University	DIMACS REU	The Random Tree Process	Mario Szegedy Department of Computer Science Rados Radoicic Department of Mathematics
Chris LaVallee University of St. Thomas	DIMACS REU	Statistical Methods of Signal Detection	Ivan Zorych DIMACS
Bernard Lidický Charles University	DIMACS REU	The Pinning Number of Overlapping Rectangles	Mario Szegedy Department of Computer Science Rados Radoicic Department of Mathematics
* Kelsey Livingston Smith College	Stevens REU	HB and HB Plus Protocol for RFID Tags	Rebecca Wright Susanne Wetzel Stevens Institute of Technology
* Megan Olson Winona State University	DIMACS REU	Classification of Epileptic Brain Activity	Art Chaovalitwongse Department of Industrial Engineering
Eva Ondráčková Charles University	DIMACS REU	The Pinning Number of Overlapping Rectangles	Mario Szegedy Department of Computer Science Rados Radoicic Department of Mathematics
Adam Pantel Rutgers University	Math REU	Set Colorings	János Komlós Simon Thomas Paul Ellis Department of Mathematics
Luke Postle Gordon College	DIMACS REU	Evolution of Social Networks	Kah Loon Ng Nina Fefferman DIMACS
Jeremiah Rogers Virginia Tech	DIMACS REU	Behavioral Epidemiology	Nina Fefferman DIMACS
Sohrab Shahshahani Columbia University	Math REU	Biomedical Engineering	Stan Dunn Department of Biomedical Engineering
Derek Seiple Pennsylvania State University	DIMACS REU	Sheet Folding Theory	E.A. Elsayed Department of Industrial Engineering

* Benjamin Sowell Carleton College	DIMACS REU	Online Matching for Internet Auctions	S. Muthukrishnan Department of Computer Science
Marla Slusky Rutgers University	DIMACS/Mat REU	Polynomial Equations over Matrices	Robert Wilson Department of Mathematics
Jennifer Tam Tufts University	Stevens REU	Radio Frequency IDentification (RFID) tags	Rebecca Wright Susanne Wetzel Stevens Institute of Technology
Martin Tancer Charles University	DIMACS REU	The Pinning Number of Overlapping Rectangles	Mario Szegedy Department of Computer Science Rados Radoicic Department of Mathematics
Jordan Volz Bard College	DIMACS REU	Clique Width of Monogenic Bipartite Graphs	Vadim Lozin RUTCOR
* Alex Waldron Harvard University	DIMACS REU	Weighted Signed Graphs in Quadratic Binary Optimization	Endre Boros RUTCOR
Courtney Ward California State University, Chico	DIMACS REU	Decomposition of Multidimensional Microarray Datasets	Stan Dunn Department of Biomedical Engineering
Eric Wayman Rutgers University	Math REU	Polytopes Related to Symplectic Geometry and Homotopy Theory	Chris Woodward Department of Mathematics
Siwei Zhu Rutgers University	Math REU	Quantum Computation	Mario Szegedy Department of Computer Science

The * indicates students who travelled to DIMATIA, Prague, Czech Republic (July 23 - August 9, 2006).

Graduate Student Coordinators
Vít Jelínek Charles University
Lara Pudwell Rutgers University

List of those supported in our Graduate Awards Programs.

Winter 2004/2005

Student	Dept	Institution	Project
Arati Baliga	CS	Rutgers University	"Building robust systems that have fault tolerant and recovery oriented capabilities"
Tiberius Bonates	RUTCOR	Rutgers University	"Maximum patterns and binarization in Logical Analysis of Data (LAD)"
Konrad Borys	RUTCOR	Rutgers University	"Matroid theory approach to data mining"
Shu Chen	CS	Rutgers University	"Hierarchical sensor networks"
German Enciso	Math	Rutgers University	"Systems under positive feedback: Multistability and a reduction theorem"
Xiaoling Hou	RUTCOR	Rutgers University	"Bounding multivariate probability distribution functions"
Pai-His Huang	CS	Rutgers University	"Profile hidden Markov chains"
Pandurang Kamat	CS	Rutgers University	"Privacy related challenges in sensor networks from several angles"
Tongyin Liu	RUTCOR	Rutgers University	"Stochastic programming problems with Poisson and Binomial distributions"
Miguel Mosteiro	CS	Rutgers University	"Sensor networks"
Paul Raff	Math	Rutgers University	"Extending the work done by Burke and others on a containment strategy for smallpox bioterror."
Bin Tian	CS	Rutgers University	"Computer-aided drug discovery"
Akshaya Kumar Vashist	CS	Rutgers University	"Rapid automatic extraction groups of orthologous genes"
Vince Vatter	Math	Rutgers University	"Partial order on permutations, and well-quasi-ordering and permutations"
Liming Wang	Math	Rutgers University	"Cyclin B-Cdc2/Wee1 system, which underlies the cell cycle, functions as a bi-stable switch"
Igor Zverovich	RUTCOR	Rutgers University	"Generalized stable set problem with application to the defense against bio-terrorism"

Summer 2005

Student	Dept	Institution	Project
Amit Agarwal	CS	Princeton University	"Bounding the 'price of stability' for undirected networks"
Arati Baliga	CS	Rutgers University	"Building robust systems that are fault tolerant and secure"
Eiman Elnahrawy	CS	Rutgers University	"Improving the accuracy and robustness of indoors localization systems"
Elad Hazan	CS	Princeton University	"Develop efficient convex optimization algorithms specifically for Linear Programming (LP) and Semi-Definite Programming (SDP)"
Xiaoling Hou	RUTCOR	Rutgers University	"Bounding Multivariate Probability Distribution Functions"

Adriana Karagiozova	CS	Princeton University	“Online algorithms for buy-at-bulk network design”
Irina Lozina	RUTCOR	Rutgers University	“Synthetic variables in data analysis”
Miguel Mosteiro	CS	Rutgers University	“Lower and upper bounds for broadcast and MIS in sensor networks”
Paul Raff	Math	Rutgers University	"Fire-Fighter" Problem
Akshaya Kumar Vashist	CS	Rutgers University	“Detecting clusters of orthologous genes in a large set of genomes”
Vince Vatter	Math	Rutgers University	“Permutation classes”
Lan Yu	Math	Rutgers University	“Frugality of truthful mechanisms”
Rong Zhang	CS	Rutgers University	“Classification based on characteristic samples”

Winter 2005/2006

Student	**Dept**	**Institution**	**Project**
Suhrid Balakrishnan	CS	Rutgers University	“A computational approach to discover gene essentiality”
Konrad Borys	RUTCOR	Rutgers University	“Matroid theory based approach”
Eiman Elnahrawy	CS	Rutgers University	“Towards improving the accuracy of localization systems in indoor environments”
Rohan Fernandez	CS	Rutgers University	“Algorithms and lower bounds”
Xiaoling Hou	RUTCOR	Rutgers University	“Bounding multivariate probablility distrubution functions”
Pai-His Huang	CS	Rutgers University	“Problem of classifying sequences of variable length”
Miguel Mosteiro	CS	Rutgers University	“To reduce remaining gap between the upper and lower bounds”
Paul Raff	Math	Rutgers University	“Fire-fighter problem”
Akshaya Kumar Vashist	CS	Rutgers University	“Improving ortholog detection on a multipartite graph by incorporating intra-genome gene interactions”
Liming Wang	Math	Rutgers University	“Investigate a paradox in DNA damage pathway”

Summer 2006

Student	**Dept**	**Institution**	**Project**
Amit Agarwal	CS	Princeton University	“Zero-one laws for first order logic statements in random geometric graphs”
Arati Baliga	CS	Rutgers University	“Host-based intrusion detection systems”
Tiberius Bonates	RUTCOR	Rutgers University	“A support vector machine based on logical patterns”
Corina Calinescu	Math	Rutgers University	“Intertwinging vertex operators and recursions”

Shu Chen	CS	Rutgers University	"Spatio-temporal access control"
Yingying Chen	CS	Rutgers University	"Security analysis of localization algorithms using signal strength"
Ricardo Collado	RUTCOR	Rutgers University	"Structural characterization of CIS graphs"
Rohan Fernandez	CS	Rutgers University	"Randomized lower bounds in radio networks"
Mangesh Gupte	CS	Rutgers University	"Study of cache oblivious algorithms"
Pai-His Huang	CS	Rutgers University	"Class of Markov models"
Cem Iyigun	RUTCOR	Rutgers University	"Probabilistic distance clustering"
Pandurang Kamat	CS	Rutgers University	"An identity-based security framework for vehicular networks"
Miguel Mosteiro	CS	Rutgers University	"Upper and lower bounds in sensor networks"
Marcelo Mydlarz	CS	Rutgers University	"Algorithmic equitable Brooks' Theorem"
Hoi Hu Nguyen	Math	Rutgers University	"Independent transversal sets"
Tuan Phan	CS	Rutgers University	"Enforce accesses to resources and data in an enterprise computing environment"
Paul Raff	Math	Rutgers University	"Fire-fighter Problem"
Akshaya Kumar Vashist	CS	Rutgers University	"Finding exact orthologs as a system of distinct representatives from a multipartite graph"

Student Participants in the DIMACS/DIMATIA/ Rényi project

Student	**Institution**
Vera Asodi	Tel-Aviv University
Martin Bálek	Charles University
Trevor Bass	DIMACS-Rutgers
Sarah Bleiler	Seton Hall University
Manuel Bodirsky	DIMATIA, Berlin
Drago Bokal	Simon Fraser University
Julia Böttcher	Technische Universität München
Craig Bowles	Cornell University
Milan Bradonjic	University of California Los Angeles
Justin Charles Bush	Dartmouth College
Teena Conklin Carroll	Georgia Tech
Jakub Cernÿ	Charles University
Jason Chiu	Rutgers
Jeong Ok Choi	University of Illinois at Urbana-Champaign
Josef Cibulka	Charles University
Ricardo A. Collado	RUTCOR, Rutgers University
Joshua Cooper	NYU
Daniel Wesley Cranston	University of Illinois Urbana-Champaign
Bill Cuckler	DIMACS-Rutgers

Raghavan S Dhandapani	New York University
Devendra Jayant Desai	Rutgers University
Zdenék Dvořék	DIMATIA, Charles University, Prague
Paul Ellis	DIMACS-Rutgers
Rohan Jude Fernandes	Rutgers University
Jan Foniok	Charles University
Daniel Gerbner	Eaotvas Lorand University
Mohammad Mahmoody Ghidary	Princeton University
Adam Matthew Goyt	Michigan State University
Mangesh Charudatta Gupte	Rutgers Univrsity
Stephen Hartke	DIMACS-Rutgers
Nadia Heninger	Princeton University
Jan Hladky	Charles University, Prague
Carlos Hoppen	University of Waterloo
Jan Hubicka	Charles University, Prague
Liviu Ilinca	Rutgers University
Asif Jamshed	Rutgers University
Vit Jelinek	Charles University
Teresa Xiaohua Jin	University of South Carolina
Jin Jinji	Kyung Hee University
Nathan Kahl	Stevens Institute of Technology
Jan Kára	DIMATIA, Charles University, Prague
Hemanshu Kaul	University of Illinois at Urbana-Champaign
Graeme David Kemkes	University of Waterloo
Balázs Keszegh	Central European University
Tamas Kiraly	Rényi Institute
Yoshiharu Kohayakawa	Emory University
Antonina Kolokolova	University of Toronto
Daniel Král	DIMATIA, Charles University, Prague
Dan Krasner	UC Berkeley and DIMACS
Klay Kruczek	DIMACS-Rutgers
Nikolaos Leonardos	Rutgers University
MPo-Shen Loh	Princeton University
Eyal Lubetzky	IAS
Adam W. Marcus	Georgia Institute of Technology
Martin Marés	DIMATIA, Charles University, Prague
Jana Maxová	DIMATIA, Charles University, Prague
Martin Milanic	RUTCOR
Melissa Mitchell	University of Detroit-Mercy
Miguel Mosteiro	Rutgers University
Olga Myndyuk	Stevens Institute of Technology
Pavel Nejedly	Georgia Institute of Technology
Samuel Nelson	Bucknell University
Hoi Huu Nguyen	Rutgers University
David Papp	RUTCOR, Rutgers University
Balázs Patkós	Eötvös University, Budapest, Hungary
Tsvetelina Vaneva Petkova	Amherst College
Martin Pergel	Charles University
Diana Piguet	Charles University

Attila Por	Rényi Institute
David Alexander Griffith Pritchard	University of Waterloo
Ale Prívetivÿ	Charles University
Lara Pudwell	Rutgers University
Michael Richter	Rutgers University
Gabor Rudolf	Rutgers University
Robert Šámal	DIMATIA, Charles University, Prague
Sara Soffer	Rutgers University
Uri Stav	IAS
Ida Svejdarova	University Of Illinois at Urbana-Champaign
László Szakács	Eötvös University, Budapest, Hungary
Arjun Talwar	Stanford University
Nguyen Tien Thanh	Eötvös University, Budapest, Hungary
Sujith Vijay	Rutgers University
John Villalpando	Clemson University and Gonzaga University
Nick Weininger	DIMACS-Rutgers
Paul Wollan	Georgia Institute of Technology
Phil Matchett Wood	Rutgers University
Syeda Arzoo Zehra	Rutgers University
Jihui Zhao	Rutgers University

6.5 DIMACS Permanent Members

Rutgers University - DIMACS

James Abello
Interests: Discrete and computational geometry and applications; very large graph theory; visualization and animation.
Web page: n/a

Tamra Carpenter
Interests: Optimization and its applications, particularly relating to telecommunication network design, emergency planning and decision-making under uncertainty.
Web page: n/a

Mel Janowitz
Interests: Consensus theory, lattices, cluster analysis, pattern recognition.
Web page: n/a

Brenda Latka
Interests: Structure theorems for tournaments, tournament classes defined by finite obstruction sets, well-quasi-orderings, and antichains of tournaments.
Web page: http://ww2.lafayette.edu/%7Emath/Brenda/index.html

Fred S. Roberts
Interests: Mathematical models in the biological, social, behavioral, and environmental sciences and of problems of communications, information, and transportation; applications of the mathematical sciences to homeland security; graph theory and combinatorics; measurement theory; utility, decisionmaking, and social choice; mathematics education.
Web page: http://www.dimacs.rutgers.edu/People/Staff/froberts/

Rutgers University - Computer Science

Eric Allender
Interests: Computational complexity theory.
Web page: http://www.cs.rutgers.edu/~allender

B.R. Badrinath
Interests: Mobile wireless computing, sensor networks designing services for wireless networks.
Web page: http://www.cs.rutgers.edu/~badri/

Martin Farach-Colton
Interests: Algorithms; computational molecular biology.
Web page: http://www.cs.rutgers.edu/~farach

Michael Fredman
Interests: Data structures and algorithms; computational complexity.
Web page: n/a

Michael Grigoriadis
Interests: Algorithms for network optimization.
Web page: n/a

Haym Hirsh
Interests: Artificial intelligence; machine learning.
Web page: http://www.cs.rutgers.edu/~hirsh

Bahman Kalantari
Interests: Mathematical programming; matrix scaling; polynomial root-finding; polynomiography; art.
Web page: www.polynomiography.com

Joe Kilian
Interests: Cryptology (theory and applied), algorithms and complexity theory
Web page: http://www.cs.rutgers.edu/~jkilian/

Michael L. Littman
Interests: Algorithmic and experimental analysis of learning for sequential decision making, game theory, probabilistic satisfiability, navigation planning
Web page: http://www.cs.rutgers.edu/~mlittman/index.html

Dimitris Metaxas
Interests: Human shape and motion estimation, human activity monitoring and recognition, medical image analysis,and modeling, biosensors, Physics-based modeling and simulation, computer animation, applications to homeland security.
Web page: http://cbim.rutgers.edu/director.htm

S. (Muthu) Muthukrishnan
Interests: Algorithms for massive data streams.
Web page: http://cs.rutgers.edu/~muthu/

Barbara Ryder
Interests: Static and dynamic program analysis for object-oriented systems to use in practical software tools
Web page: http://www.cs.rutgers.edu/~ryder

William Steiger
Interests: Discrete and computational geometry; probability; algorithms and data structures.
Web page: http://www.cs.rutgers.edu/~steiger/

Mario Szegedy
Interests: Algorithms and complexity; combinatorics; quantum computing
Web page: http://www.cs.rutgers.edu/~szegedy/

Endre Szemeredi
Interests: Number theory; extremal graphs; theoretical computer science.
Web page: n/a

Rutgers University - Mathematics

Jozsef Beck
Interests: Combinatorics; combinatorial games; number theory.
Web page: n/a

Richard Bumby
Interests: Number theory.
Web page: http://www.math.rutgers.edu/~bumby

Lisa J. Carbone
Interests: Geometric group theory, discrete groups, group actions on trees, combinatorics for problems in algebra, algebra, Kac-Moody groups.
Web page: http://www.math.rutgers.edu/~carbonel/

Gregory Cherlin
Interests: Logic; model theory; model theoretic algebra.

Web page: http://www.math.rutgers.edu/~cherlin/

Israel Gelfand
Interests: Artificial intelligence; mathematics; neuroanatomy; cell biology.
Web page: n/a

Simon Gindikin
Interests: Theory of representations; integral geometry; several complex variables; mathematical physics; molecular biology problems.
Web page: http://www.math.rutgers.edu/~gindikin/

Stephen Greenfield
Interests: Complex analysis, partial differential equations, cryptography, mathematics education.
Web page: http://math.rutgers.edu/~greenfie/

Jeffry Kahn
Interests: Discrete mathematics, probability, geometry and computer science.
Web page: n/a

Janos Komlos
Interests: Combinatorics; probability; theoretical computer science.
Web page: http://www.math.rutgers.edu/~komlos/

Joel Lebowitz
Interests: Statistical mechanics of equilibrium and nonequilibrium processes; discrete and continuous time stochastic particle systems; computer simulation of statistical mechanical model systems; foundations of statistical mechanics.
Web page: http://www.math.rutgers.edu/~lebowitz/

Richard Lyons
Interests: Finite simple groups.
Web page: http://www.math.rutgers.edu/~lyons/

Dianne Maclagan
Interests: Geometric combinatorics and combinatorial and computational commutative algebra and algebraic geometry.
Web page: http://www.math.rutgers.edu/~maclagan/

Konstantin Mischaikow
Interests : Topological methods for the analysis of dynamical systems; computational topology and dynamics; mathematical biology
Web page : http://www.math.rutgers.edu/~mischaik/

Michael O'Nan
Interests: Permutation groups; simple groups.
Web page: n/a

Vladimir Retakh
Interests: Noncommutative algebra and combinatorics, special functions and differential equations, homological algebra and algebraic topology, mathematics education
Web page: http://www.math.rutgers.edu/~vretakh/

Joseph G. Rosenstein
Interests: Mathematics education; linear orderings; recursive model theory.
Web page: http://dimacs.rutgers.edu/nj_math_coalition/joer/joer.html

Michael Saks
Interests: Computational complexity; algorithms; extremal set theory; partially ordered sets.
Web page: http://www.math.rutgers.edu/~saks/

Saharon Shelah
Interests: Logic; model theory.
Web page: http://shelah.logic.at/

Andrew Sills
Interests: q-series identities; partitions; symbolic computation
Web page: http://www.math.rutgers.edu/~asills

Charles Sims
Interests: Computational group theory and algebraic algorithms.
Web page: http://www.math.rutgers.edu/~sims/

Avraham Soffer
Interests: Mathematical physics, quantum dynamics of many body systems and environment effects; analysis in probability; limit theorems; nonlinear dynamics and scattering
Web page: http://www.math.rutgers.edu/pub/soffer

Eduardo Sontag
Interests: Control theory; mathematical systems molecular biology; artificial neural networks.
Web page: http://www.math.rutgers.edu/~sontag

Simon Thomas
Interests: Set theory, model theory; infinite groups.
Web page: http://www.math.rutgers.edu/~sthomas/

Wolmer Vasconcelos
Interests: Commutative algebra and computational algebra.
Web page: http://www.math.rutgers.edu/~vasconce/

Van Vu
Interests: Probabilistic methods, sharp concentration phenomenon, random structures and algorithms and additive number theory.
Web page: http://math.rutgers.edu/~vanvu/

Doron Zeilberger
Interests: Enumerative and algebraic combinatorics, computerized proofs of identities, experimental mathematics.
Web page: http://www.math.rutgers.edu/~zeilberg

Rutgers University – RUTCOR (Rutgers Center for Operations Research)

Farid Alizadeh
Interests: Convex optimization, combinatorial optimization, statistical learning theory.
Web page: http://rutcor.rutgers.edu/~alizadeh

Adi Ben-Israel
Interests: Matrix theory; convexity and optimization; mathematical programming; mathematical economics.
Web page: http://rutcor.rutgers.edu:80/~bisrael/

Endre Boros
Interests: Discrete and combinatorial optimization; finite geometries.

Web page: http://rutcor.rutgers.edu:80/~boros/

Jonathan Eckstein
Interests: Integer programming, linear programming, nonlinear programming, operations research, operations management, application of operations research techniques to managing information systems. Applications of convex analysis.
Web page: http://rutcor.rutgers.edu:80/~jeckstei/

Vladimir Gurvich
Interests: Complexity of generating problems in combinatorics; game theory: Nash equilibrium, positional games; graph theory: edge and vertex coloring, perfect graphs
Web page:

Peter. L. Hammer
Interests: Logical analysis of data and discrete applied mathematics.
Web page: http://rutcor.rutgers.edu:80/~hammer/

Alexander Kogan
Interests: Boolean functions; discrete optimization; artificial intelligence.
Web page: http://rutcor.rutgers.edu:80/~kogan/

Vadim V. Lozin
Interests: Discrete mathematics and theoretical computer science, combinatorics, graph theory, Boolean functions, logic.
Web page" http://rutcor.rutgers.edu/~lozin

Andras Prekopa
Interests: Stochastic processes; stochastic optimization; linear and nonlinear programming; convex geometry, history of mathematics, applications for economics and engeeniring systems.
Web page: http://rutcor.rutgers.edu/~prekopa/

Michael H. Rothkopf
Interests: Practice of operations research; models of bidding; energy economics.
Web page: http://rutcor.rutgers.edu:80/~rothkopf/

Andrzej Ruszczynski
Interests: Operations research, management science, stochastic programming, financial optimization, risk.
Web page: http://www.rusz.rutgers.edu/

David F. Shanno
Interests: Linear and nonlinear programming; numerical analysis; parallel computing.
Web page: http://rutcor.rutgers.edu:80/~shanno/

Rutgers University - Statistics

Ram (Ramanathan) Gnanadesikan
Interests: Statistical data analysis; graphics; pattern recognition.
Web page: http://www.stat.rutgers.edu/people/faculty/gnanad.html

Richard Gundy
Interests: Harmonic analysis, wavelets, probabilistic methods in analysis.
Web page: http://www.stat.rutgers.edu/people/faculty/gundy.html

Donald Hoover
Interests: Longitudinal methods, infectious disease epidemiology, clustered randomization and multiple comparisons.

Web page: http://www.stat.rutgers.edu/people/faculty/hoover.html

Rebecka Jornsten
Interests: Bioinformatics, data compression and its statistical implications, image and signal processing, and timeseries analysis.
Web page: http://www.stat.rutgers.edu/~rebecka

John Kolassa
Interests: Saddlepoint approximation techniques and their applications to biostatistical inference, and combinatoric techniques in statistics.
Web page: http://www.stat.rutgers.edu/people/faculty/kolassa.html

Juan Lin
Interests: Multivariate statistics, combinatorics, dimensionality reduction and compression.
Web page: http://stat.rutgers.edu/~jklin

Regina Liu
Interests: Resampling methods, nonparametric statistics, robust statistics, text mining, data depth, statistical quality control
Web page: http://www.stat.rutgers.edu/~rliu

David Madigan
Interests: Data mining; statistical computing; Bayesian data analysis; graphical Markov models.
Web page: http://stat.rutgers.edu/~madigan

Joseph Naus
Interests: Probabilistic and statistical approaches to looking for unusual clustering of patterns within DNA and protein sequences, and measuring the unusulaness of matching of patterns between multiple DNA sequences. Statistical approaches to data editing, survey sampling, and applied statistics.
Web page: http://www.stat.rutgers.edu/people/faculty/naus.html

Lawrence Shepp
Interests: Probability; tomography; combinatorics.
Web page: http://www.stat.rutgers.edu/~shepp

William Strawderman
Interests: Decision theory, Multiparameter estimation, Bayesian Statistics.
Web page: http://www.stat.rutgers.edu/people/faculty/straw.html

Minge Xie
Interests: Statistical methodologies, model developments and theories, with applications in bio-medical sciences, social sciences, industry, and environmental sciences.
Web page: http://stat.rutgers.edu/~mxie

Rutgers University – Chemistry/Biochemistry

Ronald Levy
Interests: Problems in the statistical mechanics of solutions, protein folding and ligand binding, and protein dynamics on longer time scales; the interplay between computational models and experiments at different levels of spatial and temporal resolution from atomic to mesoscopic, and from femtoseconds to seconds.
Web page: http://rutchem.rutgers.edu/content_dynamic/faculty/ronald_m_levy.shtml

Wilma Olson
Interests: Theoretical and computational studies of the relationship of chemical architecture to the conformation, properties, and interactions of biological macromolecules, with major emphasis on nucleic acids.

Web page: http://rutchem.rutgers.edu/content_dynamic/faculty/wilma_k_olson.shtml

Rutgers University - CMSCE

Gerald Goldin
Interests: Mathematical physics; lie theory; mathematics education; psychology of problem solving.
Web page: http://www.physics.rutgers.edu/people/pips/Goldin.html

Rutgers University - SCILS (Communication, Information & Library Studies)

Paul B. Kantor
Interests: Information retrieval and filtering systems and evaluation; security- related issues distributed detection and decision; quantum computation; the networked information environment and the value of information.
Web page: http://scils.rutgers.edu/~kantor

Rutgers University - Genetics

David Axelrod
Interests: Cellular and molecular oncology; tumor cell heterogeneity; tumor progression; cell population dynamics; computer-aided diagnosis of human breast cancer by image cytometry.
Web page: http://lifesci.rutgers.edu/~molbiosci/Professors/axelrod.html

Rutgers University - Industrial Engineering

Tayfur Altiok
Interests: Queueing systems, simulation modeling, performance analysis of supply chains, logistics and security at marine ports and waterways, analysis of ship arrival processes, and computer information systems.
Web page: http://www.soe.rutgers.edu/ie/people/faculty/altiok.html

Wanpracha Chaovalitwongse
Interests: Optimization, data mining, biomedical applications, brain research and other complex systems
Web page: http://www.engr.rutgers.edu/ie/people/faculty/art.html

Elsayed A. Elsayed
Interests: Quality and reliability engineering, sensors and production planning and control.
Web page: http://coewww.rutgers.edu/ie/qre

Michael Tortorella
Interests: Network performance and reliability, numerical analysis.
Web page: http://coewww.rutgers.edu/ie/people/faculty/michael.html

Rutgers University - Other

Richard Mammone, CAIP Center
Interests: The development of methods of signal analysis , computational models and pattern recognition algorithms used for the identification of people (Biometrics) ,chemicals (Chemometrics) and temporal spatial events (object recognition and tracking from video imagery).
Web page: www.caip.rutgers.edu/wiselab

Benjamin Melamed, Department of MSIS
Interests: System modeling and performance evaluation (mainly for telecommunications systems, supply chain management and homeland security operations); analytical and simulation modeling methodologies;

hybrid simulation (discrete and fluid-flow transactions) and IPA (infinitesimal perturbation analysis); stochastic processes and time series; visual interactive environments for modeling and decision support
Web page: http://www.melamed.rutgers.edu

Rutgers University - Psychology

Michael Leyton
Interests: Shape representation in CAD/CAM, robotics, human and computer vision; group-theoretic approach to software, mechanical and aerospace
engineering, foundations of physics.
Web page: http://www.rci.rutgers.edu/~mleyton/homepage.htm

AT&T Labs - Research

David Applegate
Interests: Large-scale combinatorial optimization problems, in particular focusing on network design and optimization, and on the traveling salesman problem.
Web page:

Aaron Archer
Interests: Discrete (combinatorial) optimization and algorithmic game theory: approximation algorithms, algorithmic mechanism design, graph algorithms, network flows, online algorithms, and applications of combinatorial optimization in other fields, such as facility location problems, vehicle routing, and graph partitioning problems motivated by machine vision and web applications.
Web page: http://www.research.att.com/~aarcher

Adam L. Buchsbaum
Interests: Algorithms; data structures; graph problems; combinatorics.
Web page: http://www.research.att.com/info/alb

Edith Cohen
Interests: Algorithm design and analysis
Web page: http://www.research.att.com/~edith/

Nick Duffield
Interests: Applied probability; queueing; telecommunications; statistical mechanics.
Web page: http://www.research.att.com/info/duffield

Peter Fishburn
Interests: Utility and decisionmaking; social choice; graph theory; foundations of probability.
Web page: n/a

Emden R. Gansner
Interests: Graph drawing and algorithms; programming languages.
Web page: n/a

Albert Greenberg
Interests: Networks; performance analysis; big data.
Web page: n/a

Guy Jacobson
Interests: Algorithms; data compression; games.
Web page: n/a

David S. Johnson
Interests: Combinatorial optimization; complexity theory.

Web page: http://www.research.att.com/~dsj/

Howard Karloff
Interests: Theoretical computer science, with an emphasis on approximation, on-line, and randomized algorithms.
Web page: n/a

Keh-Wei Lih
Interests: Network design and optimization; mixed integer programming, algorithm design and development.
Web page: n/a

Carsten Lund
Interests: Algorithms, tools, networking.
Web page: n/a

Michael Merritt
Interests: Distributed algorithms; cryptographic protocols; formal methods.
Web page: n/a

Steven Phillips
Interests: Algorithms in telecommunications.
Web page: n/a

Magda Procopiuc
Interests: Algorithms and data structures, clustering techniques, information retrieval, data mining, computational geometry, and kinetic algorithms.
Web page: http://www.research.att.com/~magda

Nick Reingold
Interests: Algorithms; network design.
Web page: n/a

Mauricio G. C. Resende
Interests: Combinatorial optimization; metaheuristics; interior point methods.
Web page: http://www.research.att.com/~mgcr

Neil J. A. Sloane
Interests: Mathematics; electrical engineering; computer science; statistics.
Web page: http://www.research.att.com/~njas

Mikkel Thorup
Interests: Combinatorial algorithms and data structures.
Web page: n/a

Suresh Venkatasubramanian
Interests: Algorithms; computational geometry; computational biology and chemistry; external memory algorithms.
Web page: n/a

Kiem-Phong Vo
Interests: Discrete/graph data structures and algorithms; graph visualization; pattern matching; data compression; software architecture and design; reliability; libraries.
Web page: n/a

Avaya Labs

Jon Bentley
Interests: Experimental algorithms.
Web page: n/a

Mathilde Benveniste
Interests: Wireless telecommunications systems access and resource management, performance optimization and design of algorithms and protocols for converged voice-data telecommunications networks.
Web page: n/a

Wen-Hua Ju
Interests: Data mining and visualization; statistical computing
Web page: http://www.research.avayalabs.com/user/whju/

Mark Karol
Interests: High-performance, broadband packet-switching architectures, local and metropolitan area network architectures, wireless communications networks, and optical networks
Web page: n/a

A.S. Krishnakumar
Interests: Wireless networking: mobility management, QoS, location, ad hoc networks
Web page: n/a

Jim Landwehr
Interests: Data Analysis and Data Mining including classification, clustering, graphics, and statistical modeling.
Web page: http://www.research.avayalabs.com/user/jml

Colin Mallows
Interests: Statistical theory and methods, data analysis, software reliability, moment-problems, inequalities, combinatorics, coding theory.
Web page: n/a

Ravi Sethi
Interests: Programming languages.
Web page: http://cm.bell-labs.com/cm/who/ravi/

Bell Labs / Lucent Technologies

Matthew Andrews
Interests: Simulators for disk drive scheduling and ATM private network-network interface routing.
Web page: http://cm.bell-labs/cm/ms/who/andrews/index.html

Alexei Ashikhmin
Interests: Coding Theory, Information Theory, Combinatorics, Quantum Information Theory
Web page: http://cm.bell-labs.com/who/aea/index.html

Brenda Baker
Interests: Analysis of algorithms and design and implementation of software tools.
Web page: http://cm.bell-labs.com/who/bsb/

Yuliy Baryshnikov
Interests: Probability theory and applications; mathematical economics and operations research; singularities, low-dimenstional topology; dynamical systems
Web page: http://cm.bell-labs.com/ms/who/ymb

Sem C. Borst
Interests: Performance evaluation, queueing theory, resource allocation, stochastic networks, wireless communications
Web page: http://cm.bell-labs.com/cm/ms/who/sem/

Ken Clarkson
Interests: Discrete and computational geometry; applications
Web page: http://cm.bell-labs.com/who/clarkson/

Dennis Dams
Interests: Model checking, verification, testing, temporal logic, specification, abstract interpretation, static analysis, semantics, real time and reactive systems, telecommunication systems
Web page: http://www.cs.bell-labs.com/who/dennis/

Steven Fortune
Interests: Computational geometry.
Web page: http://cm.bell-labs.com/who/sjf/

Christopher Fuchs
Interests: Quantum information theory; quantum communication and cryptography; quantum foundations in the light of quantum information; quantum control and quantum computation.
Web page: http://cm.bell-labs.com/who/cafuchs

Juan Garay
Interests: Cryptography, distributed computing, algorithms.
Web page: http://www.bell-labs.com/user/garay/

Michael Garey (retired)
Interests: Algorithms and complexity; discrete math; scheduling theory.
Web page: n/a

Michael Greenwald
Interests: Distributed systems, computer networks and security, preformance evaluation
Web page: http://www.cis.upenn.edu/~mbgreen/

Lov Grover
Interests: Quantum computation, optimization algorithms, complexity theory.
Web page: http://www.bell-labs.com/~lkgrover

Piyush Gupta
Interests: Wireless networks, queuing theory, learning and intelligent systems, information theory, applied probability.
Web page: http://cm.bell-labs.com/cm/ms/who/pgupta/index.html

Tin Kam Ho
Interests: Pattern recognition, data mining, interactive data visualization, modeling and simulation of complex systems.
Web page: http://cm.bell-labs.com/who/tkh

Girija Narlikar
Interests: Wireless and data networks.
Web page: http://www.cs.bell-labs.com/~girija

Marty Reiman

Interests: Applied probability: queueing theory, stochastic control, diffusion processes; applied to broadband networking and other computer/communication systems.
Web page: http://cm.bell-labs.com/who/marty

Haobo Ren
Interests: Functional data analysis, logitudunal data analysis, time series analysis; nonparametric smoothing, multivariate data analysis, cluster analysis; data mining/statistical learning, massive/dynamic/adaptive data analysis; categorical data analysis, survival/reliability analysis and missing data problem.
Web page: http://cm.bell-labs.com/who/ren/index.html

Iraj Saniee
Interests: Network design, distributed optimization, performance optimization of communications systems.
Web page: http://cm.bell-labs.com/cm/ms/who/iis/

F. Bruce Shepherd
Interests: Geometric and algorithmic approximation for combinatorial optimization problems.
Web page: n/a

Emina Soljanin
Interests: Coding and information theory, symbolic dynamics, mathematics of telecommunication systems.
Web page: n/a

Alexander Stolyar
Interests: Stochastic Processes; queues; high speed networks, wireless networks.
Web page: n/a

Steven Van Enk
Inteerests: Quantum communication and quantum information (phsical implementations, quantum cryptography, teleportation); Quantum optics and QED (mechanical effects of light, angular momentum of light, casimir effect).
Web page: n/a

Adriaan Van Wijngaarden
Interests: Information theory, communication theory, combinatorics, networks, coding, modulation, synchronization.
Web page: http://cm.bell-labs.com/who/alw

Qiong Wang
Interests: Quantative modeling and decision analysis of economic issues in communications networks.
Web page: n/a

Christopher White
Interests: Theoretical quantum chemistry, Communications devices and systems, Numerical methods and simulation, Electromagnetics and optics.
Web page: n/a

Phil Whiting
Interests: Scheduling in wireless networks, coding theory; large deviations theory and importance sampling, occupancy models, stochastic networks.
Web page: n/a

Indra Widjaja
Interests: Communication networks.
Web page: n/a

Gordon Wilfong
Interests: Networking, protocol analysis, game theory and graph edge coloring.
Web page: n/a

Francis Zane
Interests: Network performance, complexity theory, digital watermarking, algorithms.
Web page: n/a

Lisa Zhang
Interests: Design, analysis and implementation of algorithms.
Web page: http://cm.bell-labs.com/who/ylz

Georgia Institute of Technology

William Cook
Interests: Integer programming and combinatorial optimization.
Web page: http://www2.isye.gatech.edu/~wcook/

Richard DeMillo
Interests: Software reliability; security.
Web page: http://www.cc.gatech.edu/welcome.html

Subhash Khot
Interests: PCPs and hardness of approximation; metric embeddings; lower bounds.
Web page: http://www-static.cc.gatech.edu/~khot/

Richard Lipton
Interests: Architecture; complexity; VLSI.
Web page: n/a

Milena Mihail
Interests: Randomized algorithms, Markov Chain Monte Carlo methods, algorithms and models for the Internet, the WWW, peer-to-peer networks and other complex networks.
Web page: http://www-static.cc.gatech.edu/~mihail/

Dana Randall
Interests: Randomized algorithms, Markov chain Monte Carlo, computational problems from statistical physics, combinatorics.
Web page: http://www.math.gatech.edu/~randall

Prasad Tetali
Interests: Discrete math and theory of computing, including probability, combinatorics, number theory and randomized algorithms.
Web page: http://www.math.gatech.edu/~tetali/

Robin Thomas
Interests: Graph theory (including infinite graphs), combinatorics, combinatorial optimization, algorithms.
Web page: http://www.math.gatech.edu/~thomas/

Tom Trotter
Interests: Combinatorics and graph theory with emphasis on extremal problems for discrete structures (with special interests in finite partially ordered sets), on-line algorithms, approximation algorithms, ramsey theory, discrete geometry, and discrete optimization.
Web page: http://www.math.gatech.edu/~trotter/

Vijay Vazirani

Interests: Design of efficient exact and approximation algorithms, algorithmic game theory, computational complexity theory, algorithmic problems in coding theory.
Web page: http://www-static.cc.gatech.edu/~vazirani/

Santosh Vempala
Interests: Computer science and systems
Web page: n/a

Eric Vigoda
Interests: Randomized algorithms, stochastic Processes (especially Markov Chain Monte Carlo), statistical physics.
Web page: http://www-static.cc.gatech.edu/~vigoda/

HP Labs

Sandeep Bhatt
Interests: Enterprise security management, algorithms.
Web page: n/a

John Erickson
Interests: Policy-based digital asset management, digital object repository architectures, distributed architectures for long-term preservation, digital rights management
Web page: n/a

Stuart Haber
Interests: Security and cryptography.
Web page: n/a

Bill Horne
Interests: Security (tamper resistant software, digital rights management, software and media watermarking, cryptography) and Machine Learning.
Web page: n/a

Joseph Pato
Interests: Trust, security, privacy.
Web page: http://www.hpl.hp.com/personal/Joe_Pato

Benny Pinkas
Interests: Cryptography, Privacy, Theory of Computer Science.
Web page: http://www.pinkas.net

Sivaram Rajagopalan
Interests: Cryptography; average-case complexity.
Web page: n/a

Prasad Rao
Interests: Novel applications of logic programming, security policy analysis and enforcement
Web page: n/a

Tomas Sander
Interests: Security, privacy, authentication, digital rights management.
Web page: n/a

Cipriano Santos
Interests: Formulating interger programming problems to solve real engineering problems; solving satisfacibility problems using integer programming techniques.

Web page: n/a

Ram Swaminathan
Interests: Complexity theory, combinatorial optimization, game theory, cryptography, and graph and matriod theory.
Web page: n/a

Yunhong Zhou
Interests: Approximation and combinatorial algorithms; computational geometry; algorithmic game theory; computational biology; programming language
Web page: n/a

IBM Research

Nikhil Bansal
Interests: Approximation and Online Algorithms, especially applied to scheduling, routing and graph problems. Some queueing theory.
Web Page: http://www.research.ibm.com/people/n/nikhil/

Gregory Chaitin
Interests: Program-size complexity, algorithmic information theory, metamathematics, philosophy of science.
Web page: http://www.cs.auckland.ac.nz/CDMTCS/chaitin/

Alan J. Hoffman
Interests: Combinatorics and optimization; linear algebra.
Web page: n/a

Jayant Kalagnanam
Interests: Decision support, optimization, economics and their applications to electronic commerce and production planning and scheduling.
Web page: http://www.research.ibm.com/people/j/jayant

Phokion Kolaitis
Interests: Logic in computer science, principles of database systems, computational complexity.
Web page: http://www.almaden.ibm.com/cs/people/kolaitis/

Robert Krauthgamer
Interests: Combinatorial Optimization; Computational Complexity; Finite Metric Spaces; Approximation Algorithms; Data Analysis.
Web page: http://www.almaden.ibm.com/cs/people/robi

Jon Lee
Interests: Optimization.
Web page: http://www.research.ibm.com/people/j/jonlee

Nimrod Megiddo
Interests: Game theory.
Web page: http://theory.stanford.edu/~megiddo/bio.html

Laxmi Parida
Interests: Computational biology and informatics, computer vision, geometric computing, design and analysis algorithms.
Web page: http://www.research.ibm.com/people/p/parida

Baruch Schieber

Interests: Efficiency of computation, in particular: design and analysis of efficient algorithms, combinatorial optimization, parallel and distributed computation, complexity theory.
Web page: http://www.research.ibm.com/people/s/sbar/

Gregory Sorkin
Interests: Random graphs and formulas; phase transitions; average-case analysis of algorithms; combinatorial optimization.
Web page: http://www.research.ibm.com/people/s/sorkin/

Gustavo Stolovitzky
Interests: Computational and systems biology, Reverse engineering biological circuits, biological networks, dynamical systems, statistical physics, probability theory.
Web page: http://www.research.ibm.com/FunGen

Microsoft Research

Christian Borgs
Interests: Phase transitions in combinatorics and theoretical computer science, graph theory, structural and dynamical properties of networks, analysis of Monte Carlo Markov chains, algorithmic game theory and online auctions.
Web page: http://research.microsoft.com/~borgs/

Jennifer Chayes
Interests: Graph theory and networks, phase transitions in combinatorial optimization, game theory and auction algorithms.
Web page: http://research.microsoft.com/~chayes/

Jeong Han Kim
Interests: Extremal graph theory, random graphs and structures, probabilistic methods in combinatorics, combinatorial optimization, discrete probability theory, neural networks, networks & systems.
Web page: http://research.microsoft.com/theory/jehkim/

Laci Lovasz
Interests: Discrete algorithms, in particular, sampling through Markov chains; geometric representations of graph; Colin de Verdiere number.
Web page: http://research.microsoft.com/Users/lovasz

Assaf Naor
Interests: Analysis; probablility; convex geometry; linear and non-linear geometric Banach space theory; structure theory of discrete metric spaces; applications of the previous to theoretical computer science, combinatorics and mathematical physics.
Web page: http://research.microsoft.com/research/theory/naor/

David Wilson
Interests: Discrete probability, algorithms.
Web page: http://dbwilson.com

NEC Laboratories America

Leon Bottou
Interests: Learning theory and algorithms, neural nets, stochastic algorithms, image analysis, data compression, video compression.
Web page: http://leon.bottou.com

C. William Gear

Interests: Numerical methods is computer vision; scientific computing; differential equations.
Web page: http://www.neci.nj.nec.com/homepages/cwg

Sean Hallgren
Interests: Theoretical computer science, quantum computation.
Web page: http://www.cs.caltech.edu/~hallgren

Martin Roetteler
Interests: Quantum computing, quantum error-correcting codes, signal transformations, combinatorial design theory.
Web page: http://www.iqc.ca/~mroetteler/

Princeton University - Computer Science

Sanjeev Arora
Interests: Complexity theory; probabilistically checkable proofs; approximation algorithms; computational uses of randomness.
Web page: http://www.cs.princeton.edu/~arora/

Moses Charikar
Interests: Design and analysis of algorithms, with an emphasis on approximation and on-line algorithms. Combinatorial optimization, network design, scheduling, clustering, information retrieval and data mining.
Web page: http://www.cs.princeton.edu/~moses/

Bernard Chazelle
Interests: Sublinear algorithms; computational geometry; data structures.
Web page: http://www.cs.princeton.edu/~chazelle

David Dobkin
Interests: Graphics; analysis of algorithms; geometry.
Web page: http://www.cs.princeton.edu/~dpd/

Andrea LaPaugh
Interests: Information search; combinatorial algorithms; data mining.
Web page: http://www.cs.princeton.edu/~aslp/

Jennifer Rexford
Interests: Network protocols, network measurement, and network management.
Web page: http://www.cs.princeton.edu/~jrex

Rob Schapire
Interests: Theory, practice and applications of machine learning, especially boosting and other large-margin classification methods, as well as on-line learning algorithms.
Web page: http://www.cs.princeton.edu/~schapire

Robert Sedgewick
Interests: Analysis of algorithms; algorithm visualization.
Web page: http://www.cs.princeton.edu/~rs/

Jaswinder Singh
Interests: Parallel computing applications and systems; computational biology.
Web page: http://www.cs.princeton.edu/~jps

Mona Singh
Interests: Computational molecular biology and its interface with machine learning and algorithms.
Web page: http://www.cs.princeton.edu/~mona

Ken Steiglitz
Interests: Computing with particles; economic simulation; computer music.
Web page: http://www.cs.Princeton.EDU/~ken

Robert Tarjan
Interests: Data structures; graph algorithms; complexity.
Web page: http://www.cs.princeton.edu/~ret/

Olga Troyanskaya
Interests: Bioinformatics and genomics, bridging Computer Science and Molecular Biology.
Web page: http://www.cs.princeton.edu/~ogt

Princeton University - Ecology and Evolutionary Biology

Simon Asher Levin
Interests: Modeling of ecological systems; dynamics of populations and communities; spatial heterogeneity and problem of scale; evolutionary, mathematical and theoretical ecology.
Web page: http://www.eeb.princeton.edu/~slevin/

Princeton University - Electrical Engineering

Robert Calderbank
Interests: Coding theory.
Web page: n/a

Sergio Verdu
Interests: Information theory: fundamental limits of data transmision and compression systems.
Web page: http://www.princeton.edu/~verdu/

Princeton University - Math

John Conway
Interests: Combinatorics; games.
Web page: n/a

Harold Kuhn
Interests: Game theory.
Web page: n/a

John F. Nash, Jr.
Interests: Logic, game theory, and cosmology and gravitation.
Web page: n/a

Peter Sarnak
Interests: Data structures; graph algorithms.
Web page: n/a

Paul Seymour
Interests: Graph theory.
Web page: http://www.math.princeton.edu/~pds/

Princeton University - Statistics and Operations Research

Warren Powell

Interests: Stochastic optimization, and in particular approximate dynamic programming, and their application to a broad range of stochastic resource allocation problems spanning military and civilian applications from transportation and logistics to social services. Within this setting, research interests include methods for optimal learning, convergence analysis of algorithms, semi-cooperative behavior over networks and knowledge networks.
Web page: www.castlelab.princeton.edu

Robert J. Vanderbei
Interests: Optimization.
Web page: http://www.princeton.edu/~rvdb/

Rensselaer Polytechnic Institute

Mark K. Goldberg
Interests: Algorithms; graph theory; social networks.
Web page: http://www.cs.rpi.edu/~goldberg

Stevens Institute of Technology

Stephen L. Bloom
Interests: Mathematical structures in computer science.
Web page: http://www.cs.stevens.edu/~bloom/

Adriana Compagnoni
Interests: Language-based security, secure information flow analysis, mobile access control, and concurrency.
Web page: www.cs.stevens.edu/~abc

H. Quynh Dinh
Interests: Graphics; shape representations; modeling; rendering
Web page: http://www.cs.stevens.edu/~quynh/

Robert Gilman
Web page: Group theory.
Interests: www.math.stevens.edu/~rgilman

Wei Jiang
Interests: Statistical methods for quality control and reliability optimization; business forecasting; data mining and enterprise intelligence; data integration and data quality management; Bayesian network and influence diagram; supply chain management and logistics optimization.
Web page: n/a

Marco Lenci
Interests: Dynamical systems, ergodic theory, statistical mechanics, probability theory, quantum chaos, quantization, semiclassical analysis.
Web page: http://www.math.stevens.edu/~mlenci/

Yi Li
Interests: Differential equations, applied math, mathematical biology, numerical computations.
Web page: n/a

Alexei Miasnikov
Interests: Algebra, theoretical computer science, cryptography.
Web page: http://www.math.mcgill.ca/~alexeim/

David Naumann

Interests: Semantics and verification, formal methods and security.
Web page: http://www.cs.stevens.edu/~naumann

Arnold B. Urken
Interests: Information fusion, voting theory.
Web page: n/a

Susanne Wetzel
Interets: Cryptography, network security, biometrics.
Web page: http://www.cs.stevens.edu/~swetzel

Rebecca Wright
Interests: Privacy, cryptography, security, distributed computing.
Web page: http://www.cs.stevens.edu/~rwright/

Telcordia Technologies

Giovanni Di Crescenzo
Interests: Cryptography; security; computational complexity.
Web page: n/a

Dennis Egan
Interests: Human-computer interaction, text search, emergency communication.
Web page: n/a

Martin Eiger
Interests: Telecommunications network planning and engineering; optimization; scheduling algorithms.
Web page: n/a

K.R. Krishnan
Interests: Mathematical models for high-speed data traffic, measurements-based control of network performance, centralized and decentralized algorithms for routing and flow-allocation.
Web page: n/a

Hanan Luss
Interests: Operations Research methodology with emphasis on resource allocation, network design, facilty location, and capacity expansion. Application areas: telecommunications and logistics.
Web page: n/a

Sanjai Narain
Interests: Network security, symbolic logic, programming languages, logic programming.
Web page: n/a

Arnie Neidhardt
Interests: Network performance, traffic models, quantum theory.
Web page: n/a

David Rosenbluth
Interests: Visual system neuroscience, bio-mimetic systems, developmental systems, coding and compression in the nervous system, role of context in sensory processing, context switching systems, computational learning theory, mechanism design, computational sociology.
Web page: n/a

David Shallcross
Interests: Discrete optimization.
Web page: n/a

John Sucec
Interests: Mobile wireless ad hoc netwoks; routing; quality of service.
Web page: n/a

Eric van den Berg
Interests: Applied probability; network traffic models; wireless networks; intrusion detection.
Web page: n/a

Other

Alfred Aho, Columbia University
Interests: Algorithms, compilers, database systems and programming tools.
Web page: http://www1.cs.columbia.edu/~aho/

Bill Aiello, University of British Columbia
Interests: Cryptography and distributed computing.
Web page: n/a

Rajeev Alur, University of Pennsylvania
Interests: Foundations for modeling and verification of embedded systems, distributed computing, logic and automata theory.
Web page: http://www.cis.upenn.edu/~alur/

Tewodros Amdeberhan, DeVry Institute of Technology
Interests: Combinatorics, Number Theory, Special Functions, Partial Differential Equations, Computer Algebra, Algorithmic Proof Theory, Harmonic Analysis.
Web page: http://www.math.temple.edu/~tewodros

Alexander Barg, University of Maryland
Interests: Coding theory; combinatorics; finite algebra; computer science.
Web page: http://www.enee.umd.edu/~abarg/

Jonathan Berry, Sandia National Laboratories
Interests: Experimental algorithmics, software systems for discrete mathematics.
Web page: n/a

Enrico Bombieri, Institute for Advanced Study
Interests: Number Theory.
Web page: n/a

Chandra Chekuri, University of Illinois, Urbana-Champaign
Interests: Algorithms, combinatorial optimization, approximation algorithms, scheduling
Web page: http://www.cs.uiuc.edu/homes/chekuri/

Fan Chung, University of California, San Diego (also associated with Telcordia Technologies)
Interests: Spectral graph theory, discrete geometry, algorithmic design, parallel computation, software reliability, communication systems, and internet computing.
Web page: http://math.ucsd.edu/~fan

Vasek Chvatal, Concordia University
Interests: Algorithms; combinatorics; graph theory; operations research.
Web page: http://www.cs.concordia.ca/~chvatal/

Edward G. Coffman, Columbia University

Interests: Combinatorial scheduling and packing theory; probabilistic analysis of algorithms; stochastic modeling; stochastic optimization.
Web page: http://comet.columbia.edu/~egc

Valerie De Bellis, The Shodor Education Foundation, Inc.
Interests: Mathematics education; interactions between affect and cognition during mathematical problem solving.
Web page: n/a

Nathaniel Dean, Texas State University – San Marcos
Interests: Graph theory, operations research, algorithms, bioinformatics, combinatorics, and data mining.
Web page: n/a

Sven Dickinson, University of Toronto
Interests: Computational vision problems of object modeling: object recognition, attention, shape recovery and tracking; use of viewer-centered representations in landmark recognition and planning for mobile robot navigation.
Web page: http://www.cs.toronto.edu/~sven/

Kousha Etessami, University of Edinburgh
Interests: Automated verification; model checking; modeling and algorithmic analysis of reactive systems; temporal logic & automata; algorithms & computational complexity; probabilistic systems; game theory; logic.
Web page: n/a

Joan Feigenbaum, Yale University
Interests: Theory of computation, foundations of electronic commerce.
Web page: http://www.cs.yale.edu/homes/jf

Lance Jeremy Fortnow, University of Chicago
Interests: Computational complexity theory; bounded rationality in game theory; cryptography; learning theory.
Web page: http://www.cs.uchicago.edu/~fortnow/

Ronald Graham, University of California, San Diego
Interests: Combinatorics; graph theory; number theory, theoretical computer science.
Web page: n/a

Andras Hajnal, Hungarian Academy of Sciences (retired)
Interests: Set theory; discrete mathematics.
Web page: http://www.math.rutgers.edu/~ahajnal/

Rob Hochberg, East Carolina University
Interests: Combinatorics and graph theory.
Web page: n/a

Frank Hwang, Retired (formerly of AT&T Labs - Research)
Interests: Discrete math; optimization.
Web page: n/a

Markus Jakobsson, Indiana University Bloomington
Interests: Cryptography, wireless security, phishing, e-commerce, incentive mechanisms, electronic elections, privacy.
Web page: http://www.informatics.indiana.edu/markus/

Sampath Kannan, University of Pennsylvania

Interests: Program checking, reactive and real-time systems, probabilistic algorithms, learning theory, graph theory and combinatorics, computational biology.
Web page: n/a

Jon Kettenring, Drew University; Telcordia Technologies (Retired)
Interests: Multivariate statistics; cluster analysis; massive data problems.
Web page: n/a

Sanjeev Khanna, University of Pennsylvania
Interests: Design and analysis of algorithms; combinatorial optimization; application of combinatorial optimization techniques to computer systems; databases; network design, and robotics; structural complexity theory; combinatorics; graph theory.
Web page: http://www.cis.upenn.edu/~sanjeev/

Maria Klawe, Harvey Mudd College
Interests: Human-computer interaction, cognitive aids for people with aphasia, interactive multi-media (education, mathematics, programming, literacy, and art-therapy), gender issues related to information technology theoretical computer science (data structures, algorithms, complexity).
Web page: http://www.hmc.edu/headline/Klawe.html

Natalia Komarova, Institute for Advanced Study
Interests: Mathematical biology, virus dynamics, cancer modeling; mathematical modeling of learning and evolution of language; nonlinear waves, natural pattern formation, e.g. tidal sand waves.
Web page: n/a

Robert Kurshan, Cadence Design Systems
Interests: Formal verification; model checking; automata theory; protocol verification; homomorphic reduction; technology transfer.
Web page: n/a

Yann LeCun, New York University
Interests: Machine learning, computer vision, robotics, bioinformatics; data mining; digital libraries; data compression; physics of computation.
Web page: http://yann.lecun.com

Linda Lesniak, Drew University
Interests: Combinatorics and graph theory.
Web page: n/a

Joseph Malkevitch, York College (CUNY)
Interests: Geometry, especially geometry of polyhedra, graph theory, combinatorics, discrete mathematics, mathematical modeling, and mathematics education.
Web page: http://www.york.cuny.edu/~malk

Stephen B Maurer, Swarthmore College
Interests: Discrete math; algorithmics; modeling; mathematical exposition.
Web pageL http://www.swarthmore.edu/NatSci/smaurer1

Nick Maxemchuk, Columbia University
Interests: Network topologies, network protocols, multicasting, privacy, document marking, packet radio.
Web page: http://www.comet.columbia.edu/~nick/

Clyde Monma, Formerly of Telcordia Technologies
Interests: Combinatorial optimization; applications to telecommunications.
Web page: http://www.monma.com/clyde

Craig Nevill-Manning, Google
Interests: Bioinformatics, inferring sequential structure, digital libraries, machine learning and data compression.
Web page: n/a

Nick Pippenger, Harvey Mudd College
Interests: Computational complexity theory, communication networks, combinatorics, probability theory.
Web page: n/a
Andrew Odlyzko, University of Minnesota
Interests: Cryptography; number theory; combinatorics; coding theory; analysis; probability theory.
Web page: http://www.dtc.umn.edu/~odlyzko

Andrew Ogielski, Dartmouth College
Interests: Simulation.
Web page: n/a

Rafail Ostrovsky, UCLA
Interests: Cryptography; computer security; distributed protocols and algorithms.
Web page: http://www.cs.ucla.edu/~rafail/

Panos Pardalos, University of Florida
Interests: Global and combinatorial optimization; biocomputing; massive datasets; data mining; Quantitative Neuroscience.
Web page: http://www.ise.ufl.edu/pardalos

Gabor Pataki, University of North Carolina at Chapel Hill
Interests: Convex programming, especially its geometry and duality; theoretical and computational integer programming.
Web page: http://www.or.unc.edu/~pataki

David Pennock, Yahoo! Research Labs
Interests: Electronic commerce, artificial intelligence, information markets, auctions, Internet modeling/analysis, recommender systems, machine learning, decision theory, uncertain reasoning, decentralized coordination.
Web page: http://dpennock.com

Carl Pomerance, Dartmouth College
Interests: Number theory, with applications to cryptography.
Web page: http://www.math.dartmouth.edu/~carlp/

Avi Rubin, Johns Hopkins University
Interests: Cryptography; network security; secure systems; web security.
Web page: http://avirubin.com/

Ronitt Rubinfeld, MIT
Interests: Sublinear time algorithms, property testing, randomized algorithms, program result checking, computational learning theory.
Web page: http://theory.lcs.mit.edu/~ronitt/

Serap Savari, University of Michigan
Interests: Information theory, data compression, network coding, computing and communication systems.
Web page: http://www.eecs.umich.edu/~savari

Amin Shokrollahi, Digital Fountain

Interests: Coding theory; multiple antenna wireless networks; computational number theory; algebraic complexity theory; theory of finite fields; computational representation theory; signal processing; cryptography.
Web page: http://www.shokrollahi.com/amin

Peter Shor, Massachusetts Institute of Technology
Interests: Quantum computing; algorithms; computational geometry.
Web page: http://www-math.mit.edu/people/faculty/shor.html

Warren Smith, Temple University
Interests: Fundamental limits on computation set by laws of physics; algorithms; chess programming; optimal shapes.
Web page: n/a

Alexander Soifer, University of Colorado
Interests: Euclidean Ramsey Theory; Combinatorial & Discrete Geometry History of Mathematics in the XX Century.
Web page: http://www.uccs.edu/~asoifer

Diane Souvaine, Tufts University
Interests: Development and analysis of geometric algorithms with multidisiplinary applications.
Web page: http://www.cs.tufts.edu/~dls

Martin Strauss, University of Michigan
Interests: Massive data sets; security; complexity theory.
Web page: http://www.eecs.umich.edu/~martinjs/

David Waltz, Columbia University
Interests: Artificial intelligence; constraint propagation; memory-based reasoning; information retrieval.
http://www1.cs.columbia.edu/~waltz/

Ward Whitt, Columbia University
Interests: Queueing theory, performance analysis, stochastic models of telecommunication systems, numerical transform inversion.
Web page: http://www.ieor.columbia.edu/~ww2040

Avi Wigderson, Institute for Advanced Study
Interests: Complexity theory, parallel and distributed computation, combinatorics and graph theory, combinatorial optimization algorithms, randomness and cryptography, quantum computation and communication.
Web page: http://www.math.ias.edu/~avi

Peter Winkler, Dartmouth
Interests: Discrete math; probability; theory of computing.
Web page: http://www.math.dartmouth.edu/~pw/

Andrew Wright, Star Lab - Intertrust Technologies
Interests: Systems architecture, security, applied cryptography, virtual machines, compilers, mobile code, type systems and programming language theory.
Web page: http://www.star-lab.com/wright/personal-index.html

Mihalis Yannakakis, Columbia University
Interests: Algorithms; complexity; databases; testing.
Web page: http://www.cs.columbia.edu/~mihalis

Andrew Yao, Tsinghua University

Interests: Computational complexity; analysis of algorithms.
Web page: http://www.castu.tsinghua.edu.cn/yao/

6.6 Current and Past Special Focus Programs

Discrete and Computational Geometry, Sept. 1989 - Aug. 1990
http://dimacs.rutgers.edu/SpecialYears/1989_1990/

Complexity Theory of Interactive Computation, Sept. 1990 - Aug. 1991
http://dimacs.rutgers.edu/SpecialYears/1990_1991/

Graph Theory and Algorithms, Sept. 1991 - Aug. 1992
http://dimacs.rutgers.edu/SpecialYears/1991_1992/

Combinatorial Optimization, Sept. 1992 - Aug. 1993
http://dimacs.rutgers.edu/SpecialYears/1992_1993/

Massively Parallel Computing, Sept. 1993 - Aug. 1994
http://dimacs.rutgers.edu/SpecialYears/1993_1994/

Mathematical Support for Molecular Biology, Aug. 1994 - Aug. 2000
http://dimacs.rutgers.edu/SpecialYears/1994_1995/

Logic and Algorithms, Sept. 1995 - Aug. 1996
http://dimacs.rutgers.edu/SpecialYears/1995_1996/

Networks, Sept. 1996 - Aug. 2000
http://dimacs.rutgers.edu/SpecialYears/1996_1997/

Discrete Probability, Sept. 1996 - Aug. 1998
http://dimacs.rutgers.edu/SpecialYears/1996_Focus/

Massive Data Sets, Sept. 1997 - Aug. 1999
http://dimacs.rutgers.edu/SpecialYears/1997_1998/

DNA Computing, Feb. 1997 - Aug. 1999
http://dimacs.rutgers.edu/SpecialYears/1997_DNA/

Large Scale Discrete Optimization, Sept. 1998 - Aug. 2000
http://dimacs.rutgers.edu/SpecialYears/1998_1999/

Computational Intractability, Sept. 1999 - Aug. 2001
http://dimacs.rutgers.edu/SpecialYears/1999_2000/

Next Generation Networks Technologies and Applications, Jan. 2000 - Aug. 2003
http://dimacs.rutgers.edu/SpecialYears/2000_NGN/

Computational Molecular Biology, Sept. 2000 - Aug. 2004
http://dimacs.rutgers.edu/SpecialYears/2000_2003/

Mathematics and the Foundations of Computer and Information Science, Sept. 2000 - August 2003
http://dimacs.rutgers.edu/SpecialYears/2000_MathFound/

Data Analysis and Mining, Sept. 2001 - Aug. 2006
http://dimacs.rutgers.edu/SpecialYears/2001_Data/

Computational Information Theory and Coding, Sept. 2001 - August 2004
http://dimacs.rutgers.edu/SpecialYears/2001_COD/

Computational Geometry and Applications, Sept. 2002 - Aug. 2005
http://dimacs.rutgers.edu/SpecialYears/2002_CompGeom/

Computational and Mathematical Epidemiology, June 2002 - 2007
http://dimacs.rutgers.edu/SpecialYears/2002_Epid/

Communication Security and Information Privacy, Jan. 2003 - Aug. 2007
http://dimacs.rutgers.edu/SpecialYears/2003_CSIP/

Computation and the Socio-Economic Sciences, Jan. 2004 - Aug. 2007
http://dimacs.rutgers.edu/SpecialYears/2004_CSEC/

Information Processing in Biology, 2004 - 2008
http://dimacs.rutgers.edu/SpecialYears/2005_IPB/

Discrete Random Systems, Jan. 2006 - Dec. 2008
http://dimacs.rutgers.edu/SpecialYears/2005_DRS/

6.7 Industry Participation in Programs, Projects, and Committees

Industrial Committee Members:

Executive Committee
- Sandeep Bhatt, HP Labs
- Jennifer Chayes, Microsoft Research
- Dennis Egan, Telcordia Technologies
- Steve Fortune, Bell Labs
- Sean Hallgren, NEC Laboratories America
- David S. Johnson, AT&T Labs - Research
- Jim Landwehr, Avaya
- Baruch Schieber, IBM Research

DIMACS Council
- Sandeep Bhatt, HP Labs
- Adam Buchsbaum, AT&T Labs - Research, Special Focus on Data Analysis and Mining Chair
- Jennifer Chayes, Microsoft Research
- Dennis Egan, Telcordia Technologies
- Steven Fortune, Bell Labs
- Sean Hallgren, NEC Laboratories America
- David S. Johnson, AT&T Labs - Research
- Jim Landwehr, Avaya
- Baruch Schieber, IBM Research
- Emina Soljanin, Bell Labs

Advisory Board
- Jennifer Chayes, Microsoft Corp.
- Brenda Dietrich, IBM Research
- Cynthia Dwork, Microsoft Research

Postdoctoral Selection Committee
- Adam Buchsbaum, AT&T Labs - Research
- David S. Johnson, AT&T Labs - Research
- Sivaram Rajagopalan, HP Labs
- Ronitt Rubinfeld, NEC Research Institute
- Gregory Sorkin, IBM Research
- Lisa Zhang, Bell Labs

Projects Committee
- Emina Soljanon, Bell Labs
- Eric Van den Berg, Telcordia Technologies

Education Committee
- Adam L. Buchsbaum, AT&T Labs - Research
- Giovanni DiCrescenzo, Telcordia Technologies

Graduate Student Selection Committee
- Graham Cormode, AT&T Labs - Research
- Giovanni DiCrescenzo, Telcordia Technologies
- Sean Hallgren, NEC Laboratories America
- Suresh Venkatasubramanian, AT&T Labs - Research

Visitor Committee
- Steven Fortune, Chair, Bell Labs
- Howard Karloff, AT&T Labs - Research
- Dmitry Pavlov, NEC

Computing Equipment Committee
- Nick Reingold, AT&T Labs - Research

Strategic Planning Committee
- David S. Johnson, AT&T Labs - Research

Industrial Organizers of Special Focus Programs, 2004-2007
- Christian Borgs, Microsoft Research
- Adam Buchsbaum (chair), AT&T Labs - Research
- Robert Calderbank, (chair), AT&T Labs - Research
- Steven Fortune, Bell Labs
- Ayant Kalagnanam, IBM Research
- Diane Lambert, Bell Labs (now Google)
- David Pennock, Overture Services
- Avi Rubin, AT&T Labs - Research
- Amin Shokrollahi, Digital Fountain
- Emina Soljanin (co-chair), Bell Labs
- Gregory Sorkin, (co-chair), IBM Research

Industrial Members of Special Focus Advisory Committees, 2004-2007
- Ansuman Bagchi, Merck Research (Special Focus on Computational and Mathematical Epidemiology)
- Andrea Califano, First Genetic Trust (Special Focus on Computational Molecular Biology)
- Jennifer Chayes, Microsoft Research (Special Focus on Discrete Random Systems)
- Ken Clarkson, Bell Labs (Special Focus on Computational Geometry and Applications)
- Jim Fickett, SmithKlineBeecham (Special Focus on Computational Molecular Biology)
- Sorin Istrail, Celera Genomics (Special Focus on Computational Molecular Biology)
- Sorin Istrail, Celera Genomics (Special Focus on Computational and Mathematical Epidemiology)
- Thomas Lengauer, GMD (Special Focus on Computational Molecular Biology)
- Michael Liebman, Roche Bioscience (Special Focus on Computational Molecular Biology)
- Daryl Pregibon, AT&T Labs - Research (Special Focus on Data Analysis and Mining)
- Rafail Ostrovsky, Telcordia Technologies (Special Focus on Data Analysis and Mining)
- Shibu Yooseph, Celera Genomics (Special Focus on Computational and Mathematical Epidemiology)

Industrial Organizers of Workshops, Working Groups and Tutorials, 2004-2007
- Ran Canetti, IBM Research
- Graham Cormode, Bell Labs/AT&T Labs - Research
- Drew Dean, SRI International
- Brenda Dietrich, IBM Research
- Cynthia Dwork, Microsoft
- Kevin Furman, ExxonMobil Research & Engineering
- Andrew Goldberg, Microsoft Research
- Benny Pinkas, HP Labs
- Piyush Gupta, Bell Labs
- Markus Jakobsson, RSA Laboratories
- David Johnson, AT&T Labs - Research
- Ari Juels, RSA Laboratories
- Jayant Kalagnanam, IBM Research

- Gerhard Kramer, Bell Labs
- Brian LaMacchia, Microsoft
- Robin Lougee-Heimer, IBM Research
- László Lovász, Microsoft Research
- Kobbi Nissim, Microsoft Research
- Laxmi Parida, IBM Research
- David Pennock, Yahoo! Research Labs
- D. Sivakumar, IBM Almaden Research Center
- Emina Soljanin, Bell Labs
- Gregory Sorkin, IBM Research
- Gustavo Stolovitzky, IBM Computational Biology Center
- Adriaan van Wijngaarden, Bell Labs

Industrial Researchers on Current DIMACS Projects

Monitoring Message Streams:

- Rafail Ostovsky, Telcordia/UCLA
- Martin Strauss, AT&T Labs - Research/Princeton

DHS Center:

- James Abello, ask.com
- Yuliy Baryshnikov, Bell Labs
- Robert Bell, AT&T Labs - Research
- Ken Clarkson, Bell Labs
- Graham Cormode, AT&T Labs - Research
- Colin Goodall, AT&T Labs - Research
- Tin Kam Ho, Bell Labs
- Debasis Mitra, Bell Labs
- Haobo Ren, Bell Labs
- Peter Patel Schneider, Bell Labs

Large Graphs Project:

- Graham Cormode, AT&T Labs - Research

6.8 Research Results

In describing a few of the many results traceable to DIMACS special years/foci and research projects, we use the abbreviations PM for permanent member, V for visitor, and PD for DIMACS postdoc.

The first DIMACS Special Year, on Discrete and Computational Geometry, run in 1989-90, led to the solution of several major open problems. Ding-zu Du (PD) and Frank Hwang (then PM) proved the 22-year-old Gilbert-Pollak conjecture that the minimum ratio between the length of a Steiner minimum tree and a minimum spanning tree is $\sqrt{3}/2$. This led to improved heuristics for the design of more efficient communication networks. Also, Bernard Chazelle (PM) solved the longstanding open problem of finding a linear-time algorithm for triangulating a simple polygon (without adding new vertices). The work of Jiri Matousek (V) on derandomizing epsilon-net constructions and computing hyperplane cuttings has been very influential and led Chazelle to derive the first optimal deterministic convex hull algorithm, solving one of the most central problems in computational geometry.

DIMACS Special Year on Complexity Theory of Interactive Computing played a central role in one of the most important developments in theoretical computer science in recent years, the development of ways to reformulate computer "proofs" so that the correctness of a computation can be verified with arbitrarily high confidence by a small number of random spot checks. A critical result leading to these developments, the discovery of connections between interactive proofs and approximation algorithms, was a direct result of the Special Year. It arose from the interactions between two diverse communities, the cryptography community and the combinatorial optimization community, and came about by applying recent methods of cryptography to the maximum clique problem of combinatorial optimization. The key results were obtained by Uriel Feige (PD), Shafi Goldwasser (V), Laszlo Lovasz (then PM), Shmuel Safra (V), and Mario Szegedy (V).

During the Special Year on Graph Theory and Algorithms, a group of researchers from four different institutions, PM's David Applegate, Vasek Chvatal, and Bill Cook, together with Bob Bixby (V), collaborated to solve what at that time was the "world's largest" unsolved Traveling Salesman Problem. The TSP problem they solved arose from the question of how to most efficiently connect 3,038 points for drilling holes in making a circuit board.

Through the "Special Year" on Mathematical Support for Molecular Biology, the most dramatic developments were the real collaborations between biological scientists and mathematicians/computer scientists. For example, computer scientist Dannie Durand (then PM), a participant in the Special Year postdoctoral program, and Lee Silver of the Princeton Molecular Biology Department, who met through the Special Year tutorial, overturned a 40-year-old hypothesis in biology about ultraselfish genes in mice. (The hypothesis was that the low level persistence of the *t*-haplotype in natural populations is due to a balance between loss of the gene due to stochastic effects in small populations and reintroduction of the gene through migration.) Also during this Special Year, an "algorithm implementation challenge" on "shotgun sequencing" led to the discovery by biotech companies that their sequencing methods were not working right.

In many complex systems underlying modern society, small faults in hardware or software can cause system failures with severe consequences. The field of computer-aided verification (CAV), concerned with use of appropriate formal methods to judge program correctness, has grown enormously since a 1990 DIMACS CAV workshop that sparked development of the field, and is vitally important in the work of a myriad of major companies. Logic has become an important tool for CAV, in particular temporal logic, a language for expressing relationships between events occurring over time. During the Special Year on Logic and Algorithms, as a dramatic result of DIMACS efforts to bring together two distinct research communities, ideas from finite model theory were used to solve a problem of CAV concerning the expressibility of temporal logic statements. Kousha Etessami (PD), Denis Therien (V), and Thomas Wilke (PD) designed a new Ehrenfeucht-Fraisse game to capture the power of temporal logic. This in turn led to a collaboration between two computer scientists and a logician, F. Gradel (V), P. Kolaitis (V), and Moshe Vardi (V), to solve a classical open problem by proving that the decision problem for first-order logic with two variables is NEXPTIME-complete. The collaboration between Etessami and Wilke that sparked these developments would almost certainly not have happened if not for DIMACS and its Special Year tutorial. They would likely not have ever spoken to each other, because they were part of different communities.

Two research projects resulted from the Special Year on Massively Parallel Computing. The projects developed the first model and simulation of the global Internet with a hundred thousand hosts and routers, running IP packets with real routing protocols at a rate of more than one million packet hops per second. The resulting software is now used by over 40 companies and university research teams.

During the Special Year on Networks, Joe Kilian (PM) and Erez Petrank (PD) developed an escrowed identity system to protect privacy in electronic toll collection and related applications. In the first tier of this 2-tiered system, enough information is provided by the user so that an operator can be sure the user is legitimate, but otherwise the user's identity is protected. If more information is required, for example in the case of a crime, the second tier provides it, through involvement of a third party (an escrow agent).

In bin packing applications, e.g., in packing small information sets into larger, fixed-size ones, we can think of a random process generating items of various sizes to be packed into fixed-size bins. Standard bin packing algorithms such as Best Fit do not typically perform optimally. This is true even for offline algorithms such as Best Fit Decreasing. During the Special Year on Large Scale Discrete Optimization, Janos Csirik (V), David Johnson (PM), Claire Kenyon, Peter Shor (then PM), and Richard Weber developed a new, remarkably simple on-line bin packing algorithm that performs optimally (in an average case sense) for all discrete distributions of item sizes.

The general belief in statistical physics is that spontaneous symmetry-breaking is something that, if it occurs at all, occurs when the temperature drops below some unique critical point. This had indeed been proved for the Ising model. During the Special Year on Discrete Probability, a partnership among discrete mathematicians, computer scientists, and statistical physicists led to the solution of the long-open question of whether the same thing holds for the Widom-Rowlinson model, which is to the Ising exactly as vertices are to edges of a graph. Graham Brightwell (V), Olle Haggstrom (V), and Peter Winkler (PM) settled this in the negative by constructing a non-regular tree in which, as temperature is lowered, symmetry is broken, then re-established, then broken again.

In DNA computing, the goal is to use biological processes undergone by DNA and other biomolecular sequences to perform useful and difficult computations. During the Special Focus on DNA computing, Biologist Laura Landweber (PM) and computer scientist Richard Lipton (PM) collaborated in work that rapidly progressed from theory to the wet lab. In an important breakthrough, Landweber, Lipton, Anthony Cukras, and Dirk Faulhammer designed a computer built from RNA to solve the chess problem of determining the positions knights can occupy on a chessboard such that no knight can attack any other knight. Using only biological molecules and enzymes as tools, Landweber and colleagues developed and successfully executed an algorithm for solving this variant of the knight problem on a 3x3 chessboard. The results of preliminary experiments revealed that the protocol recovers far more correct solutions than expected at random, and further work led to the successful completion of the largest molecular computation in any lab to that time.

There has long been interest in using computers to mimic the process of scientific discovery. A more recent effort has been to use computers to actually generate new scientific conjectures that are then explored by researchers. As part of the Special Focus on Data Analysis and Mining, a working group explored the use of computers to generate such conjectures. This group explored conjectures generated by various software systems and Dragan Stevanovic (V) then proved a well-known conjecture in theoretical chemistry generated by the software system Graffiti. Fullerenes are molecular graphs corresponding to carbon isomers. From the graph-theoretical point of view, they are planar 3-regular graphs having either pentagons or hexagons for their faces. The conjecture proved was that the “separator” of a fullerene is at most 1. Using the interactive component of another computer-generating software system, AGX, Stevanovic and Gilles Caporossi (V) simplified the proof to show that the dodecahedron has the largest separator among all fullerenes.

In our “Monitoring Message Streams” project, we have reduced the memory usage of nearest neighbor (kNN) text classification by up to 10-fold, increased execution speed by up to 100-fold, and demonstrated scaling to tens of thousands of classes. We used related techniques to speed up application of tens of thousands of logistic regression classifiers, and used Laplace priors to reduce the size of these classifiers by 1000-fold while retaining state of the art effectiveness. Our Bayesian Binary Regression (BBR) and Bayesian Multinomial Regression (BMR) packages have been downloaded hundreds of times, are increasingly used and cited, and, we believe, constitute the most efficient software in the world for ultra-high dimensional logistic regression.

Drug safety has become a major focus for the pharmaceutical industry. Once national and international regulatory agencies license a drug, patients can then consume the drug in ways and for purposes that pre-marketing clinical trials do not foresee. “Post-marketing surveillance” concerns itself with monitoring of large-scale drug adverse event databases. The FDA’s Adverse Event Reporting System (AERS) and the CDC’s Vaccine Adverse Event Reporting Systems (VAERS) represent the primary US data sources and contain millions of adverse event reports. Various government agencies and every major pharmaceutical company conduct surveillance of AERS as well as in-house databases. The suitability of various statistical/data mining methods for surveillance is hotly debated. The DIMACS working group on Adverse Event/Disease Reporting, Surveillance and Analysis, through the DIMACS SF on Computational and Mathematical Epidemiology, found that fundamental flaws bedevil the most commonly used current algorithms. Computational constraints historically impeded more appropriate methods but such constraints no longer exist. Building on other DIMACS projects, the Adverse Events working group, under the direction of David Madigan (PM), has implemented and successfully tested a new ultra-high dimensional regression method for surveillance that has been shown to detect known signals of adverse events much faster than current widely-used methods such as GPS and RR.

6.8 Honors and Awards

Here is a selection of honors and awards given to some DIMACS members of partner institutions.

Acadamies and Institutes

National Academy of Sciences
Israel M. Gelfand, Rutgers – Math
Alan Hoffman, IBM Research (retired)
Joel Lebowitz, Rutgers – Math
Simon Levin, Princeton
John Nash, Princeton
Peter Sarnak, Princeton
Lawrence Shepp, Rutgers – Statistics
Robert Tarjan, Princeton

National Academy of Engineering
Robert Calderbank, Princeton
C. William Gear, NEC Labs America (retired)
Joeng Han Kim, Microsoft Research
Richard Lipton, Georgia Tech
Neil Sloane, AT&T Labs
Robert Tarjan, Princeton

National Academy of Medicine (Institute of Medicine)
Lawrence Shepp, Rutgers – Statistics

American Academy of Arts and Sciences
Bernard Chazelle, Princeton
Israel M. Gelfand, Rutgers – Math
Alan Hoffman, IBM Research (retired)
Simon Levin, Princeton
Peter Sarnak, Princeton
Lawrence Shepp, Rutgers – Statistics
Robert Tarjan, Princeton

American Institute of Medical and Biological Engineers Fellow
Dimitris Metaxas, Rutgers – CBIM

American Philosophical Society
Simon Levin, Princeton
John Nash, Jr., Princeton
Robert Tarjan, Princeton

American Association for the Advancement of Science Fellow
Jennifer Chayes, Microsoft Research
Richard DeMillo, Georgia Institute of Technology
C. William Gear, NEC Labs America (retired)
Ramanathan Gnanadesikan, Rutgers – Statistics
Paul Kantor, Rutgers – SCILS
Joel Lebowitz, Rutgers – Math
Simon Levin, Princeton
Wilma Olson, Rutgers – Chemistry
Robert Tarjan, Princeton

Association for Computing Machinery (ACM) Fellow
Bernard Chazelle, Princeton
Richard DeMillo, Georgia Institute of Technology
David Dobkin, Princeton
Michael Garey, Bell Labs (retired)
David Johnson, AT&T Labs
Phokion Kolaitis, IBM Research
Richard Lipton, Georgia Institute of Technology
Barbara Ryder, Rutgers – CS
Robert Sedgewick, Princeton
Ravi Sethi, Avaya Labs
Kenneth Steiglitz, Princeton
Robert Tarjan, Princeton
Mikkel Thorup, AT&T Labs
Vijay Vazirani, Georgia Institute of Technology

IEEE Fellow
Robert Calderbank, Princeton
Nick Duffield, AT&T Labs
C. William Gear, NEC Labs America (retired)
Tim Kam Ho, Bell Labs
Mark Karol, Avaya Labs
Benjamin Melamed, Rutgers – Business School
Neil Sloane, AT&T Labs
Eduardo Sontag, Rutgers – Math
Kenneth Steiglitz, Princeton
Sergio Verdu, Princeton

Institute of Mathematical Statistics Honored Fellow
Ramanathan Gnanadesikan, Rutgers – Statistics
Richard Gundy, Rutgers – Statistics
Regina Liu, Rutgers – Statistics
David Madigan, Rutgers – Statistics
Lawrence Shepp, Rutgers – Statistics
William Stawderman, Rutgers – Statistics
Yehuda Vardi, Rutgers – Statistics (deceased)

Institute for Operations Research and Management Science (INFORMS) Fellow
Peter Fishburn, AT&T Labs (retired)
Alan Hoffman, IBM Research (retired)
Harold Kuhn, Princeton
John Nash, Princeton
Warren Powell, Princeton
Michael Rothkopf, RUTCOR
David Shanno, RUTCOR
Robert Vanderbei, Princeton

L'Academie Internationale de Philosophie des Sciences
Gregory Chaitin, IBM Research

Brazilian Academy of Sciences (Academia Brasileira de Ciencias)
Wolmer Vasconcelos, Rutgers – Math

Brazilian Academy of Philosophy (Academia Brasileira de Filosofia)
Gregory Chaitin, IBM Research

European Academy of Sciences
Bernard Chazelle, Princeton
Israel Gelfand, Rutgers – Math

Hungarian National Academy of Sciences
Janos Komlos, Rutgers – Math
László Lovász, Microsoft Research
András Prékopa, RUTCOR
Endre Szemeredi, Rutgers – CS

National Academy of Engineering of Mexico
András Prékopa, RUTCOR

Royal Irish Academy
Israel M. Gelfand, Rutgers – Math

Royal Society
John Conway, Princeton
Israel Gelfand, Rutgers – Math
Peter Sarnak, Princeton

Awards and Prizes

ACM A. M. Turing Award
Robert Tarjan, Princeton (1986)

ACM Grace Murray Hopper Award
Jennifer Rexford, Princeton (2004)

ACM Paris Kanellakis Theory and Practice Award
Robert Shapire, Princeton (2004)
Robert Tarjan, Princeton (1999)

ACM/SIGACT Distinguished Service Prize
David Johnson, AT&T Labs (1997)
Fred Roberts, Rutgers – Math (1999)

Arany János Foundation Grand Prize (Hungary)
András Prékopa, RUTCOR (2002)

ASIS Research in Information Science Award
Paul Kantor, Rutgers – SCILS (2001)

Beale Orchard-Hays Prize
David Applegate, AT&T (2000)
William Cook, Georgia Institute of Technology (2000)
David Shanno, RUTCOR (1991)

Blaise Pascal Medal, European Academy of Sciences
Robert Tarjan, Princeton (2004)

Brouwer Medal of the Dutch Mathematical Society
László Lovász, Microsoft Research (1993)

Commemorative Medal of the Union of Czech Mathematicians and Physicists
Fred Roberts, Rutgers – Math (2003)

Donald E. Knuth Prize
László Lovász, Microsoft Research (1999)

Euler Medal of the Institute of Combinatorics and its Applications
Peter Hammer, RUTCOR (1998)
Doron Zeilberger, Rutgers – Math (2004)

Frank Nelson Cole Prize in Number Theory
Peter Sarnak, Princeton (2005)

Frederic Esser Nemmers Prize in Mathematics
John Conway, Princeton (1998)

Frederick W. Lanchester Prize, INFORMS
Nimrod Megiddo, IBM Research (1992)
Robert Tarjan, Princeton (1984)

Friedman Award in Applied Mathematics
Christopher White, Bell Labs (1996)

Fulkerson Prize
Jozsef Beck, Rutgers – Math (1985)
Joeng Han Kim, Microsoft Research (1997)
László Lovász, Microsoft Research (1982)
Paul Seymour, Princeton (1979, 1994, 2006)
Robin Thomas, Georgia Institute of Technology (1994)
Eric Vigoda, Georgia Institute of Technology (2006)

Gödel Prize
Sanjeev Arora, Princeton (2001)
László Lovász, Microsoft Research (2001)
Mike Saks, Rutgers – Math (2004)
Robert Schapire, Princeton (2003)
Mario Szegedy, Rutgers – CS (2001, 2005)

Gold Medal of the European Operational Research Societies
András Prékopa, RUTCOR (2003)

Humboldt Research Prize
Gerry Goldin, Rutgers – CMSCE
Fred Roberts, Rutgers – Math (declined)

IEEE Donald G. Fink Prize
Sergio Verdu, Princeton (2002)

IEEE Hendrik Bode Prize
Eduardo Sontag, Rutgers – Math (2002)

IEEE Information Theory Society Claude E. Shannon Award
Neil Sloane, AT&T Labs (1998)

IEEE Leonard G. Abraham Prize
Sergio Verdu, Princeton (2002)

IEEE Richard W. Hamming Medal
Neil Sloane, AT&T Labs (2005)

IEEE Third Millennium Medal
Kenneth Steiglitz, Princeton (2000)
Sergio Verdu, Princeton (2000)

János Bolyai International Mathematical Prize of the Hungarian Academy of Sciences
Saharon Shelah, Rutgers – Math (2000)

J. Clarence Karcher Medal
Neil Sloane, AT&T Labs (1988)

John Von Neumann Theory Prize
John Nash, Princeton (1978)
Peter Fishburn, AT&T Labs (retired) (1996)
Alan Hoffman, IBM Research (retired) (1992)
Harold Kuhn, Princeton (1980)

Joseph Levy Prize, ORSIS – Operations Research Society – Israel
Nimrod Megiddo, IBM Research (1986)

George E. Kimball Medal, INFORMS
Michael Rothkopf, RUTCOR (1997)

Kyoto Prize
Simon Levin, Princeton (2005)

Leroy P. Steele Prizes
John Conway, Princeton (2000, Mathematical Exposition)
Israel Gelfand, Rutgers – Math (2005, Lifetime Achievement)
John Nash, Princeton (1999, Seminal Contribution to Research)
Doron Zeilberger, Rutgers – Math (1998, Seminal Contribution to Research)

Levi L. Conant Prize
Peter Sarnak, Princeton (2003)

MacArthur Fellowship
Israel M. Gelfand, Rutgers – Math (1994)

Mathematical Programming Society Founder's Award
Alan Hoffman, IBM Research (retired) (2000)

Middle Cross, Republic of Hungary
András Prékopa, RUTCOR (2005)

Nobel Prize
John Nash, Princeton (1994)

NSF National Faculty Award for Outstanding Women Scientists and Engineers
Regina Liu, Rutgers – Statistics (1991)

NSF Science and Technology Centers Pioneer Award
Fred Roberts, Rutgers – Math (2001)

Ostrowski Prize
Peter Sarnak, Princeton (2001)

Paris Kanellakis Theory and Practice Award
Robert Schapire, Princeton (2004)
Robert Tarjan, Princeton (1999)

Polya Prize
John Conway, Princeton (1987)
Jeffry Kahn, Rutgers – Math (1996)
László Lovász, Microsoft Research (1979)
Peter Sarnak, Princeton (1998)
Paul Seymour, Princeton (1983, 2004)
Saharon Shelah, Rutgers – Math (1992)
Endre Szemeredi, Rutgers – CS (1975)

Széchenyi Prize from the Hungarian Government
András Prékopa, RUTCOR (1996)

Vito Volterra Medal of the Academia Nazionale de Lincei, Rome
Joel Lebowitz, Rutgers – Math (2001)

Wolf Prize in Mathematics
László Lovász, Microsoft Research (1999)
Saharon Shelah, Rutgers – Math (2001)

W.T. and Idalia Reid Prize in Mathematics
Eduardo Sontag, Rutgers – Math (2001)

Sloan Fellowship
Subhash Khot, Georgia Institute of Technology (2006)
Jeong Han Kim, Microsoft Research (1997)
Wilma Olson, Rutgers – Chemistry (1975)
Dana Randall, Georgia Institute of Technology (2001)
Vladimir Retakh, Rutgers – Math (1990)
Peter Sarnak, Princeton (1983)
Paul Seymour, Princeton (1983)
Jaswinder Pal Singh, Princeton (1998)
Avraham Soffer, Rutgers – Math (1988)
Olga Troyanskaya, Princeton (2005)

Invited Speaker International Congress of Mathematicians
Sanjeev Arora, Princeton (2002)
Neil Sloane, AT&T Labs, (1998)
Simon Thomas, Rutgers – Math (2006)
Avraham Soffer, Rutgers – Math (2006)
Eduardo Sontag, Rutgers – Math (1994)

Honorary Degrees
John Conway, Princeton, Honorary Doctorate of Science, University of Liverpool, (2001)
Peter Hammer, RUTCOR, Laurea Honoris Causa from La Sapienza University, (1998)
Alan Hoffman, IBM Research (retired), Honorary Doctorate of Sciences, Technion, (1986)
Joel Lebowitz, Rutgers – Math, Doctor Honoris Causa, Clark University, (1999)
Simon Levin, Princeton, Honorary Doctor of Sciences, Eastern Michigan University, (1990)
Simon Levin, Princeton, Honorary Doctor of Humane Letters Honoris Causa, Whittier College, (2004)
Lawrence Shepp, Rutgers – Statistics, Honorary Doctorate, New York Polytechnic University, (2004)

6.10 Visitors: November 2003 to Present

- James Abello
  AT&T Labs Research
  3/1/2002-12/31/2003
  AT&T appt.
  Fred Roberts

- James Abello
  Formerly of AT&T Labs Research
  1/1/2004-9/30/2004
  Computational and Mathematical Epidemiology
  Fred Roberts

- Tanya Alekseyevskaya (Gelfand)
  Rutgers University
  8/31/1998-9/1/2004
  General
  I. Gelfand

- David Angeli
  University of Firenze
  3/20/2004-3/28/2004
  Computational and Mathematical Epidemiology
  Partick DeLeenheer

- Marina Arav
  Georgia State University
  3/3/2006-3/13/2006
  General
  Adi Ben-Israel

- Boris Aronov
  Polytechnic University
  1/13/2004-2/12/2004
  General
  Bill Steiger

- Imre Barany
  Alfred Renyi Math Institute
  8/5/2006-8/11/2006
  General
  Endre Boros, Farid Alizedeh

- Luca Becchetti
  Universitá di Roma
  11/15/2004-12/11/2004
  Next Generation Networks Technologies and Applications
  S. Muthukrishnan

- Michael Bender
  State University of New York - Stony Brook
  6/14/2005-7/28/2005
  Computational and Mathematical Epidemiology
  Martin Farach-Colton

- Henrik Bjorklund
  Uppsala University
  2/16/2004-3/13/2004
  General
  Leonid Khachiyan

- Alex Bolshoy
  University of Haifa
  7/7/2004-8/7/2004
  Computational Molecular Biology
  Olga Troyanskaya

- Miklos Bona
  University of Florida
  9/1/2005-1/31/2006
  General
  Doron Zeilberger

- Nadia Brauner
  University of Grenoble
  3/6/2006-3/17/2006
  General
  Peter Hammer

- Kathie Cameron
  Wilfrid Laurier University
  4/26/2004-4/30/2004
  General
  Vasek Chvatal

- Michael Capalbo
  DIMACS/Rutgers University
  12/15/2003-5/15/2004
  Computational and Mathematical Epidemiology
  S. Muthukrishnan

- Michael Capalbo
  DIMACS/Rutgers University
  5/16/2004-8/1/2005
  Computational and Mathematical Epidemiology
  James Abello

- Meeyoung Cha
  Advanced Networking Lab
  8/2/2004-8/27/2004
  Data Analysis & Mining
  Muthu Muthukrishnan

- Meeyoung Cha
  Advanced Networking Lab
  9/1/2005-2/28/2006
  General
  Muthu Muthukrishnan

- Arkadev Chattopadhyay
  McGill University
  10/2/2005-10/8/2005
  General
  Mario Szegedy

- Guido Consonni
  Universitá di Pavia
  11/21/2003-12/20/2003
  Computational and Mathematical Epidemiology
  David Madigan

- Yves Crama
  University of Liege
  1/11/2006-1/21/2006
  General
  Peter Hammer

- Zsolt Csizmadia
  Eotvos Lorand University
  2/6/2004-3/7/2004
  Data Analysis & Mining
  Peter Hammer

- Zsolt Csizmadia
  Eotvos Lorand University
  6/22/2004-8/2/2004
  Data Analysis & Mining
  Peter Hammer

- Michel Deza
  Centre National de la Rechetche Scientifique
  4/21/2004-5/5/2004
  General
  Bill Steiger

- Arta Doci
  Colorado School of Mines
  5/15/2006-8/10/2006
  Communication Security and Information Privacy
  Rebecca Wright

- Adrian Dumitrescu
  University of Wisconsin – Milwaukee
  5/25/2005-6/1/2005
  Computational Geometry and Applications
  William Steiger

- Khaled Elbassioni
  Max Planck Institut fur Informatik
  2/28/2005-3/11/2005
  General
  Endre Boros, Leo Khachiyan

- Bruno Escoffier

LAMSADE Universite Paris Dauphine
11/15/2004-1/15/2005
DIMACS/LAMSADE Partnership
Fred Roberts

- Nina Fefferman
  Tufts University
  7/1/2005-8/31/2006
  Computational Molecular Biology
  Fred Roberts

- Fedor Fomin
  University of Bergen
  7/25/2006-8/5/2006
  General
  Vadim Lozin

- Tung-Shan Fu
  National Pingtung Institute of Commerce
  8/1/2006-7/31/2007
  General
  Doron Zeilberger

- Fanica Gavril
  CEMA
  9/1/2003-6/30/2004
  General
  Gregory Cherlin

- Gunnar Gjone
  University of Oslo
  1/1/2005-7/31/2005
  General
  Carolyn Maher

- Mordecai Golin
  Hong Kong University of Science and Technology
  7/2/2005-8/12/2005
  General
  S. Muthukrishnan, Bill Steiger

- Navin Goyal
  McGill University
  7/10/2006-7/17/2006
  General
  Mike Saks

- Adam Goyt
  Michigan State University
  1/12/2006-5/10/2006
  Visiting Research Assoc.
  Bruce Sagan

- Anupam Gupta
  Carnegie Mellon University

7/16/2004-7/17/2004
General
Moses Charikar

- Vladimir Gurvich
  Russian Academy of Science
  6/1/2004-6/30/2004
  General
  Endre Boros, Leo Khachiyan

- Danny Harnik
  Weizmann Institute
  6/6/2004-7/15/2004
  Communication Security and Information Privacy
  Benny Pinkas, Tal Rabin

- Penelope Haxell
  University of Waterloo
  10/10/2005-10/11/2005
  General
  Gordon Wilfong, Adam Buchsbaum, Howard Karloff

- M. Norbert Hounkonnou
  University of Abomey-Calavi
  4/8/2004-5/7/2004
  General
  Jerry Goldin

- Toshihide Ibaraki
  Kyoto University
  3/21/2005-3/30/2005
  General
  Endre Boros

- Nicole Immorlica
  MIT
  12/20/2004-12/24/2004
  Computation and the Socio-Economic Sciences
  Baruch Schieber

- Gregory Kabatiansky
  Institute for Information Transmission Problems
  1/24/2005-2/11/2005
  Computational Information Theory and Coding
  Alexander (Sasha) Barg

- Navin Kashyap
  Queen's University
  8/16/2004-8/20/2004
  Computational Information Theory and Coding
  Adriaan van Wijngaarden

- Rohit Khandekar
  University of California – Berkeley
  5/25/2005-5/31/2005

General
Nikhil Bansal

- Tobias Koch
  ETH
  8/1/2004-10/8/2004
  Computational Information Theory and Coding
  Gerhard Kramer

- Klaus-Joern Lange
  Tuebingen
  9/23/2004-9/30/2004
  General
  Eric Allender

- Isabella Lari
  University of Rome
  5/10/2006-7/22/2006
  General
  Endre Boros

- Kazuhisa Makino
  Osaka University
  9/22/2004-10/14/2004
  General
  Endre Boros, Leo Khachiyan

- Kazuhisa Makino
  Osaka University
  3/30/2006-4/9/2006
  General
  Endre Boros

- Pierre McKenzie
  University of Montreal
  10/11/2005-11/12/2005
  General
  Mario Szegedy

- Pierre McKenzie
  University of Montreal
  9/18/2006-10/28/2006
  General
  Mario Szegedy

- Olgica Milenkovic
  University of Colorado – Boulder
  5/10/2005-8/10/2005
  Computational Information Theory and Coding
  Emina Soljanin

- Boris Mirkin
  Birkbeck College
  9/17/2004-9/23/2004
  Computational Molecular Biology

Mel Janowitz

- Boris Mirkin
  Birkbeck College
  12/9/2005-12/16/2005
  General
  Fred Roberts

- Vahab Mirrokni
  MIT
  9/1/2004-10/1/2004
  Computation and the Socio-Economic Sciences
  Lisa Fleischer, Baruch Schieber

- Kenton Morgan
  University of Liverpool
  1/19/2006-1/27/2006
  Computational and Mathematical Epidemiology
  Ilya Muchnik

- Vadim Mottl'
  Tula State University
  11/2/2004-12/15/2004
  General
  Ilya Muchnik

- Seffi Naor
  Technion
  7/18/2004-8/13/2004
  General
  Moses Charikar

- Atul Narang
  University of Florida
  4/20/2004-4/21/2004
  Computational and Mathematical Epidemiology
  Patrick DeLeenheer

- Zhivko Nedev
  Wilfrid Laurier University
  6/13/2005-6/28/2005
  General
  S. Muthukrishnan

- Rafail Ostrovsky
  University of California - Los Angeles
  6/28/2004-7/9/2004
  General
  Mike Saks, Juan Garay

- Meltem Ozturk
  LAMSADE Universite Paris Dauphine
  11/15/2004-1/15/2005
  DIMACS/LAMSADE Partnership
  Fred Roberts

- Elena Panteleeva-Deza
  Moscow State Pedagogical University
  4/21/2004-5/5/2004
  General
  Bill Steiger

- Stefan Wolfgang Pickl
  University of Cologne
  5/8/2004-5/20/2004
  Computation and the Socio-Economic Sciences
  Mel Janowitz

- Sergei Sergeevitch Pilyugin
  University of Florida
  4/26/2004-4/28/2004
  Computational and Mathematical Epidemiology
  Patrick DeLeenheer

- Val Pinciu
  Southern Connecticut State University
  8/29/2004-9/25/2004
  Computational Geometry and Applications
  Fred Roberts

- Alex Pogel
  New Mexico State University
  12/12/2004-12/19/2004
  Computational and Mathematical Epidemiology
  James Abello, Mel Janowitz

- Despina Potari
  University of Patras
  9/3/2004-12/31/2004
  General
  Carolyn Maher/Michael Smith

- Dominique Quadri
  LAMSADE Universite Paris Dauphine
  6/19/2006-7/30/2006
  DIMACS/LAMSADE Partnership
  Brenda Latka, Peter Hammer, Endre Boros

- Rajeev Raman
  Leicester University
  10/9/2006-10/27/2006
  General
  S. Muthukrishnan

- Pandu Rangan
  IIT Madras
  6/26/2005-7/15/2005
  General
  Juan Garay, Tal Rabin

- Alberto Roverato
  Universitá di Economia Politica
  11/21/2003-12/20/2003
  Computational and Mathematical Epidemiology
  David Madigan

- Bruce Sagan
  Michigan State University
  1/1/2005-8/15/2006
  General
  Doron Zeilberger

- Sven Sandberg
  Uppsala University
  2/16/2004-3/13/2004
  General
  Leonid Khachiyan

- Vishal Saraswat
  University of Minnesota
  7/24/2006-8/18/2006
  Communication Security and Information Privacy
  Giovanni DiCrescenzo

- Hisham Sati
  University of Adelaide
  12/7/2005-1/21/2006
  General
  Lisa Carbone

- Serap Savari
  University of Michigan
  8/8/2004-8/18/2004
  Computational Information Theory and Coding
  Gerhard Kramer

- Yaron Sella
  Hebrew University of Jerusalem
  4/4/2004-5/1/2004
  Communication Security and Information Privacy
  Benny Pinkas, Rebecca Wright

- Hadas Shachnai
  Technion
  7/25/2005-8/24/2005
  General
  Lisa Zhang, Howard Karloff

- Eran Sharon
  Tel Aviv University
  4/5/2004-4/15/2004
  Computational Information Theory and Coding
  Alexei Ashikhmin

- Vitaly Skachek

Technion
7/7/2004-8/23/2004
Computational Information Theory and Coding
Aleksei Ashikhmin

- Iryna Skrypnyk
  University of Jyvaskyla
  7/3/2004-5/3/2005
  General/Data Analysis and Mining
  Tin Kam Ho

- Hal Smith
  Arizona State University
  4/27/2004-4/30/2004
  General
  Partick De Leenheer

- Alexander Soifer
  University of Colorado at Colorado Springs
  1/1/2003-8/31/2004
  Computational Geometry and Applications
  Saharon Sheleh

- Alexander Soifer
  University of Colorado at Colorado Springs
  7/31/2006-1/31/2007
  General
  Fred Roberts

- Vera Sos
  Mathematical Institute of Hungary
  11/9/2003-11/14/2003
  General
  Mike Saks

- Robert Spalek
  Centre for Mathematics and Computer Science
  9/6/2004-9/26/2004
  General
  Mario Szegedy

- Claudio Tancioni
  University of Rome "La Sapienza"
  5/5/2004-5/5/2005
  General
  S. Muthukrishnan

- Christian Tominski
  University of Rostock
  8/2/2005-9/27/2005
  Computational and Mathematical Epidemiology
  James Abello

- Christian Tominski
  University of Rostock

3/19/2006-3/29/2006
Computational and Mathematical Epidemiology
James Abello

- Alexis Tsoukias
  Universite Paris Dauphine
  10/18/2005-10/21/2005
  Partnered
  Fred Roberts

- Shmuel Tyszberowicz
  Tel Aviv University
  6/1/2005-8/31/2005
  General
  Naftaly Minsky

- Victoria Ungureanu
  Rutgers University / MSIS
  9/1/2003-5/31/2004
  Next Generation Networks Technologies and Applications
  Fred Roberts

- Frank van Ham
  Technische Universiteit Eindhoven
  3/6/2004-3/28/2004
  Computational and Mathematical Epidemiology
  James Abello

- Frank van Ham
  Technische Universiteit Eindhoven
  10/3/2004-10/9/2004
  Computational and Mathematical Epidemiology
  James Abello

- Nedeljko (Ned) Varnica
  Harvard University
  7/1/2004-8/31/2004
  Computational Information Theory and Coding
  Emina Soljanin

- Jurgen Vinju
  CWI
  3/31/2006-4/28/2006
  General
  Dennis Dams

- Bela Vizvari
  Eotvos Lorand University
  2/6/2004-3/7/2004
  Data Analysis & Mining
  Peter Hammer

- Bela Vizvari
  Eotvos Lorand University
  6/22/2004-8/2/2004

Data Analysis & Mining
Peter Hammer

- Sergei Vorobyov
  Uppsala University
  2/16/2004-3/13/2004
  General
  Leonid Khachiyan

- Sergei Vorobyov
  Uppsala University
  4/5/2004-4/9/2004
  General
  Leonid Khachiyan

- Sergei Vorobyov
  Uppsala University
  8/1/2004-8/31/2004
  General
  Leonid Khachiyan, Endre Boros

- Sergei Vorobyov
  Uppsala University
  11/10/2004-12/10/2004
  General
  Leonid Khachiyan, Endre Boros

- Sergei Vorobyov
  Uppsala University
  3/21/2005-4/2/2005
  General
  Leonid Khachiyan

- Sergei Vorobyov
  Uppsala University
  7/15/2005-8/30/2005
  General
  Leonid Khachiyan

- Jeannette Wing
  Carnegie Mellon University
  1/17/2005-1/17/2005
  General
  Sandeep Bhatt

- Frank Wong
  AT&T Labs-Research (Retired)
  6/10/2003-6/9/2005
  Visiting Research Assoc.
  Fred Roberts

- Xuerong Yong
  University of Puerto Rico
  12/15/2005-1/20/2006
  General

Fred Roberts

- Connie Xiaokang Yu
  New Jersey City University
  6/1/2004-8/30/2005
  General
  Fred Roberts

- Melda Yuksel
  Polytechnic University
  7/1/2004-8/31/2004
  Computational Information Theory and Coding
  Emina Soljanin

- Andrey Zinovyev
  Institut Curie
  11/22/2006-12/8/2006
  General
  Vadim Lozin

6.11 Calendar of Special Focus Workshops

2000-2004 Special Focus on Computational Molecular Biology

Workshop and Working Group Meeting on Bioconsensus
Date: October 25 - 26, 2000
Location: DIMACS Center, CoRE Building, Rutgers University
Organizers: Mel Janowitz, Rutgers University; Francois-Joseph LaPointe, University of Montreal; Fred McMorris, Illinois Institute of Technology; Boris Mirkin, University of London; Fred Roberts, Rutgers University

Distinguished Lecture: Gene Myers, Vice-President, Informatics Research, Celera Genomics
Whole Genome Assemblies of the Drosophila and Human Genomes
Date: October 26, 2000
Time: 3:00pm. Reception to follow lecture.
Location: CoRE Building, First Floor Auditorium, Rutgers University

Working Group Meeting: The Informatics of Protein Classification
Dates: December 15, 2000
Location: DIMACS Center, CoRE Building, Rutgers University
Organizers: Casimir Kulikowski, Gaetano Montelione and Ilya Muchnik, Rutgers University
Co-sponsored by The New Jersey Commission on Science and Technology Initiative on Structural Genomics and Bioinformatics and by Rutgers Bioinformatics Initiative.

Mini-Workshop: System Based Modeling in Bioinformatics
Dates: February 19 - 20, 2001
Location: DIMACS Center, CoRE Building, Rutgers University
Organizers: Michael Liebman, Abramson Family Cancer Center, University of Pennsylvania, School of Medicine; Richard L.X. Ho, R.W. Johnson Pharmaceutical Research Institute

Workshop: Whole Genome Comparison
Dates: February 28 - March 2, 2001
Location: DIMACS Center, CoRE Building, Rutgers University
Organizer: Dannie Durand, Carnegie Mellon University
Program Committee: Joseph H. Nadeau, Case Western Reserve University; Steven L. Salzberg, The Institute for Genomic Research; David Sankoff, University of Montreal

Workshop: Protein Structure and Structural Genomics: Prediction, Determination, Technology and Algorithms
Dates: March 8 - 9, 2001
Location: DIMACS Center, CoRE Building, Rutgers University
Organizers: Mona Singh, Princeton University; Sorin Istrail, Celera Genomics; Ron Levy, Rutgers University

Workshop: DNA Sequence and Topology
Dates: April 19 - 20, 2001
Location: DIMACS Center, CoRE Building, Rutgers University
Organizers: Wilma Olson and Bernard Coleman, Rutgers University, Victor Zhurkin, NIH

Workshop: Integration of Diverse Biological Data
Dates: June 21 - 22, 2001
Location: DIMACS Center, CoRE Building, Rutgers University
Organizers: Andrea Califano, First Genetic Trust; Conrad Gilliam, Columbia University; Fred S. Roberts, Rutgers University

Summer School Tutorial on New Frontiers in Data Mining

Dates: August 13 - 17, 2001
Location: DIMACS Center, CoRE Building, Rutgers University
Organizers: Dimitrios Gunopulos, University of California - Riverside and Nikolaous Koudas, AT&T Labs - Research

Tutorial on Bioconsensus II
Dates: October 2, 2001
Location: DIMACS Center, CoRE Building, Rutgers University
Organizers: Fred McMorris, Illinois Institute of Technology and William H.E. Day

Workshop on Bioconsensus II
Dates: October 3 - 5, 2001
Location: DIMACS Center, CoRE Building, Rutgers University
Workshop Organizers: Mel Janowitz, Rutgers University; Francois Lapointe, Universite de Montreal; Fred McMorris, Illinois Institute of Technology; Boris Mirkin, University of London; Fred Roberts, Rutgers University

Workshop: Analysis of Gene Expression Data
Dates: October 24 - 26, 2001
Location: DIMACS Center, CoRE Building, Rutgers University
Organizers: Laurie Heyer, Davidson College; Gustavo Stolovitzky, IBM; Shibu Yooseph, Celera Genomics

Workshop: Complexity in Biosystems: Innovative Approaches at the Interface of Experimental and Computational Modeling
Dates: April 8 - 10, 2002
Location: DIMACS Center, CoRE Building, Rutgers University
Organizers: Thomas Deisboeck, Harvard Medical School; Lee Segel, Weizmann Institute; Eduardo Sontag, Rutgers University; Raimond Winslow, Johns Hopkins

DIMACS-CTS (National Chiao Tung University) Conference on the Interconnections Among Codes, Designs, Graphs and Molecular Biology
Dates: May 24 - 26, 2002
Location: National Center of Theoretical Science, National Chiao Tung University, Hsinchu, Taiwan
Organizers: Frank Hwang, National Chiao Tung University, Fred Roberts, DIMACS, Rutgers University, David Torney, Los Alamos National Labs

Workshop: Computational Methods for SNPs and Haplotype Inference
Dates: November 21 - 22, 2002
Location: DIMACS Center, CoRE Building, Rutgers University
Organizers: Sorin Istrail, Celera Genomics; Andy Clark, Cornell University; Michael Waterman, University of Southern California and Celera

Workshop: Protein Domains: Identification, Classification and Evolution
Dates: February 27 - 28, 2003
Location: DIMACS Center, Rutgers University, Piscataway, NJ
Organizers: Stephen Bryant, NIH; Teresa Przytycka, Johns Hopkins University

Working Group: Mathematical and Computational Aspects Related to the Study of The Tree of Life
Dates: March 11 - 14, 2003
Location: DIMACS Center, CoRE Building, Rutgers University
Organizers: Melvin F. Janowitz, DIMACS; Francois-Joseph Lapointe, Universite de Montreal; F.R. McMorris, Illinois Institute of Technology; Fred Roberts, DIMACS

Workshop: Medical Applications in Computational Geometry
Dates: April 2 - 4, 2003
Location: DIMACS Center, CoRE Building, Rutgers University

Organizers: Danny Chen, University of Notre Dame; Jean-Claude Latombe, Stanford University

BioMaPS/DIMACS Tutorial: Introduction to Modern Concepts in Biology for Mathematical and Physical Scientists
Dates: June 23 - July 3, 2003
Location: DIMACS Center, CoRE Buildingm Rutgers University
Organizers: William Sofer and Paul Ehrlich, Rutgers University

Workshop: Data Mining Techniques in Bioinformatics
Dates: October 30 - 31, 2003
Location: DIMACS Center, CoRE Building, Rutgers University
Organizer: Mona Singh, Princeton University; Mark Gerstein, Yale University

Workshop: Information Processing in the Biological Organism (A Systems Biology Approach)
Dates: November 4 - 5, 2003
Location: DIMACS Center, CoRE Building, Rutgers University
Organizer: Fred S. Roberts, Chair, DIMACS / Rutgers University, and Eduardo Sontag, Co-chair, Rutgers University

Short Course: A Field Guide to GenBank and NCBI Molecular Biology Resources
Dates: December 10 - 11, 2003
Location: DIMACS Center, CoRE Building, Rutgers University
Organizer: Paul Ehrlich, BIOMAPS Institute; Mel Janowitz, DIMACS; Tara Matise, Department of Genetics

Working Group: New Algorithms for Inferring Molecular Structure from Distance Restraints
Dates: January 12 - 16, 2004
Location: DIMACS Center, CoRE Building, Rutgers University
Organizers: Michael W Trosset, College of William & Mary

Workshop: Interface Between Biology and Game Theory
Dates: April 5, 2004
Location: DIMACS Center, CoRE Building, Rutgers University
Organizers: Adam Arkin, Lawrence Berkeley Labs and UC Berkeley; Denise Wolf, Lawrence Berkeley Labs; Vijay Vazirani, Georgia Tech

Short Course:Gene Expression Resources at the National Center for Biotechnology Information (NCBI)
Dates: April 13 - 14, 2004
Location: DIMACS Center, CoRE Building, Rutgers University
Organizer: Paul Ehrlich, BIOMAPS Institute; Mel Janowitz, DIMACS; Tara Matise, Department of Genetics

BioMaPS/DIMACS/MBBC/PMMB Short Course: Transcriptional Regulation from Molecules to Systems and Beyond
Dates: June 21 - 25, 2004
Location: DIMACS Center, CoRE Building, Rutgers University
Organizers: Wilma Olson, Rutgers University; Anirvan Sengupta, Rutgers University

Workshop: Reticulated Evolution
Dates: September 20 - 21, 2004
Location: DIMACS Center, CoRE Building, Rutgers University
Organizer: Mel Janowitz, DIMACS; Bernard Moret, University of New Mexico; Randy Linder, University of Texas

Working Group: Reticulated Evolution
Dates: September 22, 2004

Location: DIMACS Center, CoRE Building, Rutgers University
Organizer: Mel Janowitz, DIMACS; Bernard Moret, University of New Mexico; Randy Linder, University of Texas

2001-2005 Special Focus on Computational Information Theory and Coding

Course: A Crash Course on Coding Theory: Madhu Sudan, MIT
Dates: November 6 - 10, 2000
Location: IBM Almaden, San Jose, California
Organizers: David P. Williamson, IBM Almaden
Co-sponsored by IBM Almaden and DIMACS.

Computational Information Theory and Coding "Kickoff"
Dates: October 26, 2001
Location: Arnold Auditorium, Bell Labs, Murray Hill, NJ
Organizer: Emina Soljanin and Adriaan van Wijngaarden, Bell Labs

Codes and Complexity
Dates: December 4 - 7, 2001
Location: DIMACS Center, CoRE Building, Room 431, Rutgers University
Organizers: Amin Shokrollahi, Digital Fountain; Dan Spielman, MIT; Ruediger Urbanke, EPFL

Working Group Meeting: Computational Complexity, Entropy, and Statistical Physics
Dates: December 12 - 13, 2001
Location: DIMACS Center, CoRE Building, Rutgers University
Organizers: Michael Fredman, Janos Komlos and Joel Lebowitz, Rutgers University

Workshop: Computational Complexity, Entropy, and Statistical Physics
Dates: December 14, 2001
Location: DIMACS Center, CoRE Building, Rutgers University
Organizers: Michael Fredman, Janos Komlos and Joel Lebowitz, Rutgers University

Workshop: C-CR Quantum Planning
Dates: January 17 - 18, 2002
Location: Hampton Inn, Elmsford, New York
Organizers: Alexander Barg, Bell Labs; Chris Fuchs, Bell Labs; Lance Fortnow, NEC Research; Peter Shor, AT&T Labs - Research

Working Group Meeting: Data Compression in Networks and Applications
Dates: first meeting March 18 - 20, 2002, second meeting Spring 2003
Location: DIMACS Center, CoRE Building, Rutgers University
Organizers: Adam Buchsbaum, AT&T Labs - Research; S. Muthukrishnan, AT&T Labs - Research and Rutgers University; Suleyman Cenk Sahinalp, Case Western University; Jim Storer, Brandeis University; Jeff Vitter, Duke University

Source Coding and Harmonic Analysis
Dates: May 8 - 10, 2002
Location: DIMACS Center, CoRE Building, Rutgers University
Organizers: Vivek Goyal, Digital Fountain and Jelena Kovacevic, Bell Labs

Signal Processing for Wireless Transmission
Dates: October 7 - 9, 2002
Location: DIMACS Center, CoRE Building, Rutgers University
Organizers: Sergio Verdu, Princeton University; Jerry Foschini, Bell Labs

Network Information Theory
Dates: March 17 - 19, 2003
Location: DIMACS Center, CoRE Building, Rutgers University
Organizers: Piyush Gupta, Gerhard Kramer, Adriaan van Wijngaarden, Bell Labs

Complexity and Inference
Dates: June 2 - 5, 2003
Location: DIMACS Center, CoRE Building, Rutgers University
Organizers: Mark Hansen, Bell Labs; Paul Vitanyi, University of Amsterdam; Bin Yu, University of California, Berkeley

Algebraic Coding Theory and Information Theory
Dates: December 15 - 18, 2003
Location: DIMACS Center, CoRE Building, Rutgers University
Organizers: Alexander Barg, DIMACS/Rutgers University; Alexei Ashikhmin, Bell Labs; Iwan Duursma, University of Illinois

Working Group Meeting: Theoretical Advances In Information Recording
Dates: March 22 - 24, 2004
Location: DIMACS Center, CoRE Building, Rutgers University
Organizers: Emina Soljanin, Bell Labs; Paul Siegel, Univ. of California, Bane Vasic, University of Arizona; Adriaan J. van Wijngaarden, Bell Laboratories

Workshop: Theoretical Advances In Information Recording
Dates: March 25 - 26, 2004
Location: DIMACS Center, CoRE Building, Rutgers University
Organizers: Emina Soljanin, Bell Labs; Paul Siegel, Univ. of California, Bane Vasic, University of Arizona; Adriaan J. van Wijngaarden, Bell Laboratories

Working Group: Network Coding
Dates: January 26 - 28, 2005
Location: DIMACS Center, CoRE Building, Rutgers University
Organizers: Gerhard Kramer, Bell Labs; Piyush Gupta, Emina Soljanin, Bell Labs

2001-2006 Special Focus on Data Analysis and Mining

Working Group: Data Analysis and Digital Libraries
Dates: May 17, 2001
Location: DIMACS Center, CoRE Building, Rutgers University
Organizers: Paul Kantor and Endre Boros, Rutgers University; David Hull, WhizBang; Michael Berry, University of Tennessee; Warren Greiff, Mitre Corporation

Working Group: Algorithms for Multidimensional Scaling I
Dates: August 6 - 9, 2001
Location: DIMACS Center, CoRE Building, Rutgers University
Organizers: J. Douglas Carroll and Phipps Arabie, Rutgers University; Lawrence Hubert, University of Illinois

Workshop: Algorithms for Multidimensional Scaling
Dates: August 10, 2001
Location: DIMACS Center, CoRE Building, Rutgers University
Organizers: J. Douglas Carroll and Phipps Arabie, Rutgers University; Lawrence Hubert, University of Illinois

Summer School Tutorial on New Frontiers in Data Mining

Dates: August 13 - 17, 2001
Location: DIMACS Center, CoRE Building, Rutgers University
Organizers: Dimitrios Gunopulos, University of California - Riverside and Nikolaous Koudas, AT&T Labs - Research

Workshop: Streaming Data Analysis and Mining
Dates: November 5, 2001
Location: DIMACS Center, CoRE Building, Rutgers University
Organizers: Adam Buchsbaum and Jennifer Rexford, AT&T Labs; Rajeev Motwani, Stanford University

Working Group: Streaming Data Analysis and Mining I
Dates: November 6 - 9, 2001
Location: DIMACS Center, CoRE Building, Rutgers University
Organizers: Adam Buchsbaum, AT&T Labs

Graph Theory Day 42
Dates: November 10, 2001
Location: DIMACS Center, CoRE Building, Rutgers University
Organizers: Mike Gargano, Pace University; John Kennedy, New York Academy of Sciences; Lou Quintas, Pace University

Working Group: Computer-Generated Conjectures from Graph Theoretic and Chemical Databases I
Dates: November 12 - 16, 2001
Location: DIMACS Center, CoRE Building, Rutgers University
Organizers: Patrick Fowler, University of Exeter; Pierre Hansen, GERAD - University of Montreal

CCR/DIMACS Workshop/Tutorial on Mining Massive Data Sets and Streams: Mathematical Methods and Algorithms for Homeland Defense
Dates of Tutorial: June 17-19, 2002
Dates of Workshop: June 20-22, 2002
Location: Center for Communications Research (CCR), Princeton, NJ
Organizers: Bob Grossman, chair, University of Illinois and Two Cultures Group; Paul Kantor, Rutgers University; Muthu Muthukrishnan, Rutgers University

Workshop: Visualization and Data Mining
Dates: October 24 - 25, 2002
Location: DIMACS Center, CoRE Building, Rutgers University
Organizers: Emden Gansner, AT&T; Michael Goodrich, Johns Hopkins University; Claudio Silva, AT&T; Roberto Tamassia, Brown University

Workshop: Video Mining
Dates: November 4 - 6, 2002
Location: DIMACS Center, CoRE Building, Rutgers University
Organizers: Azriel Rosenfeld, Daniel DeMenthon, Dave Doermann, University of Maryland

Streaming Data Analysis and Mining II (Working Group)
Dates: March 24 - 26, 2003
Location: DIMACS Center, CoRE Building, Rutgers University
Organizers: Adam Buchsbaum, AT&T Labs and Rajeev Motwani, Stanford University

Workshop: Data Depth: Robust Multivariate Analysis, Computational Geometry and Applications
Dates: May 14 - 16, 2003
Location: DIMACS Center, CoRE Building, Rutgers University
Organizers: Regina Liu, Rutgers University; Yehuda Vardi, Rutgers; Robert Serfling, University of Texas at Dallas; Diane Souvaine, Tufts University

Workshop: Management and Processing of Data Streams (In conjunction with ACM SIGMOD/PODS and FCRC 2003)
Date: Sunday, June 8, 2003
Location: San Diego, California, USA
Organizers: S. Muthukrishnan, Rutgers University; Divesh Srivastava, AT&T Labs - Research

Working Group: Algorithms for Multidimensional Scaling II
Dates: June 11-12, 2003
Location: Doubletree Hotel in Tallahassee, Florida
Organizers: J. Douglas Carroll (chairman), Rutgers University; Phipps Arabie, Rutgers University; Larry Hubert, University of Illinois; Michael Trosset, The College of William & Mary; Mike Brusco, Florida State University; Mel Janowitz, DIMACS

Workshop: Discrete Metric Spaces and their Algorithmic Applications
Dates: August 20 - 23, 2003
Location: Princeton University
Organizers: Moses Charikar, Princeton University; Piotr Indyk, MIT; Nati Linial, Hebrew University; Jiri Matousek, Charles University; Yuri Rabinovich, University of Haifa; Gideon Schechtman, Weizmann Institute

Workshop: Data Mining Techniques in Bioinformatics
Dates: October 30 - 31, 2003
Location: DIMACS Center, CoRE Building, Rutgers University
Organizers: Mona Singh, Princeton University; Mark Gerstein, Yale University

Workshop: Data Quality, Data Cleaning and Treatment of Noisy Data
Dates: November 3-4, 2003
Location: DIMACS Center, CoRE Building, Rutgers University
Organizers: Parni Dasu, AT&T

Working Group: New Algorithms for Inferring Molecular Structure from Distance Restraints
Dates: January 12 - 16, 2004
Location: DIMACS Center, CoRE Building, Rutgers University
Organizers: Michael W Trosset, College of William & Mary

Computer-Generated Conjectures from Graph Theoretic and Chemical Databases II - Second Meeting
Dates: June 2 - 5, 2004
Location: HEC Montréal 3000, chemin de la Côte-Sainte-Catherine Montréal (Québec) Canada
Organizers: Patrick Fowler, Univeristy of Exeter; Pierre Hansen, GERAD - University of Montreal

Working Group on The Burrows - Wheeler Transform: Ten Years Later
Dates: August 19 - 20, 2004
Location: DIMACS Center, CoRE Building, Rutgers University
Organizers: Paolo Ferragina, University of Pisa; Giovanni Manzini, University of Piemonte Orientale; S. Muthukrishnan, Rutgers University

Workshop: Computers in Scientific Discovery III
Dates: February 6 - 9, 2006
Location: Ghent University, Ghent, Belgium
Organizers: Gunnar Brinkmann, Ghent University; Patrick W. Fowler, University of Sheffield

2002-2005 Special Focus on Computational Geometry and Applications

Special Program: Reconnect Conference 2002: Voronoi Diagrams - Properties, Algorithms and Applications

Dates: August 11 - 17, 2002
Location: DIMACS Center, CoRE Building, Rutgers University
Organizers: Scott Drysdale, Dartmouth College; Shelly Leibowitz, Wheaton College

Workshop: Geometric Graph Theory
Dates: September 30 - October 4, 2002
Location: DIMACS Center, CoRE Building, Rutgers University
Organizers: Janos Pach, New York University, Courant Institute of Mathematical Sciences

Workshop: Computational Geometry
Dates: November 14 - 15, 2002
Location: DIMACS Center, CoRE Building, Rutgers University
Organizers: Joe Mitchell, SUNY Stony Brook

Workshop: Algorithmic Issues in Modeling Motion
Dates: November 18 - 20, 2002
Location: DIMACS Center, CoRE Building, Rutgers University
Organizers: Pankaj K. Agarwal, Duke University, Leonidas Guibas, Stanford University

Workshop: Implementation of Geometric Algorithms
Dates: December 4 - 6, 2002
Location: DIMACS Center, CoRE Building, Rutgers University
Organizers: Herve Bronnimann, Polytechnic University and Steve Fortune, Bell Labs

Workshop: Medical Applications in Computational Geometry
Dates: April 2 - 4, 2003
Location: DIMACS Center, CoRE Building, Rutgers University
Organizers: Danny Chen, University of Notre Dame; Jean-Claude Latombe, Stanford University

Workshop: Surface Reconstruction
Dates: April 30 - May 2, 2003
Location: DIMACS Center, CoRE Building, Rutgers University
Organizers: Nina Amenta, University of California - Davis; Fausto Bernardini, IBM - T. J. Watson Research Center

Workshop: Data Depth: Robust Multivariate Analysis, Computational Geometry and Applications
Dates: May 14 - 16, 2003
Location: DIMACS Center, CoRE Building, Rutgers University
Organizers: Regina Liu, Rutgers University; Yehuda Vardi, Rutgers; Robert Serfling, University of Texas at Dallas; Diane Souvaine, Tufts University

Workshop: Geometric Optimization
Dates: May 19 - 21, 2003
Location: DIMACS Center, CoRE Building, Rutgers University
Organizers: Joe Mitchell, SUNY Stony Brook; Pankaj Agarwal, Duke University

Workshop: Computer-Aided Design and Manufacturing
Dates: October 7 - 9, 2003
Location: DIMACS Center, CoRE Building, Rutgers University
Organizers: Debasish (Deba) Dutta, University of Michigan; Ravi Janardan, University of Minnesota; Michiel Smid, Carleton University

Symposium: 12th International Symposium on Graph Drawing
Dates: September 29 - October 2, 2004
Location: City College, CUNY, New York City, New York

Organizers: Gary Bloom, City College, CUNY; Peter Braß, City College, CUNY; János Pach, City College, CUNY; Farhad Shahrokhi, University of North Texas

2002-2007 Special Focus on Computational and Mathematical Epidemiology

Working Group Meeting: Mathematical Sciences Methods for the Study of Deliberate Releases of Biological Agents and their Consequences
Dates: First Meeting, March 22 - 23, 2002
Location: DIMACS Center, CoRE Building, Rutgers University
Organizers: Carlos Castillo-Chavez, Cornell University and Fred Roberts, Rutgers University

Working Group Meeting: Analogies Between Computer Viruses and Immune Systems and Biological Viruses and Immune Systems
Dates: First Meeting, June 10 - 13, 2002
Location: DIMACS Center, CoRE Building, Rutgers University
Organizers: Lora Billings, Montclair State University; Stephanie Forrest, U. New Mexico; Alun Lloyd, Institute for Advanced Study; Ira Schwartz, Naval Research Laboratory

Tutorial: Dynamic Models of Epidemiological Problems
Dates: June 24 - 27, 2002
Location: DIMACS Center, CoRE Building, Rutgers University
Organizers: Carlos Castillo-Chavez, Cornell University; Herbert Hethcote, University of Iowa; Pauline van den Driessche, University of Victoria

International Conference on Computational and Mathematical Epidemiology
Dates: June 28 - July 2, 2002
Location: DIMACS Center, CoRE Building, Rutgers University
Organizers: Simon Levin, Princeton University and Fred Roberts, Rutgers University

Tutorial: Epidemiology for Mathematical Scientists Part I: Introduction to Epidemiological Studies
Dates: August 26 - 30, 2002
Location: DIMACS Center, CoRE Building, Rutgers University
Organizers: David Ozonoff, Boston University, School of Public Health and Daniel Wartenberg, UMDNJ-Robert Wood Johnson Medical School

Tutorial: Epidemiology for Mathematical Scientists Part II: The Foundations of Molecular Genetics for Non-Biologists
Dates: August 26 - 30, 2002
Location: DIMACS Center, CoRE Building, Rutgers University
Organizer: William Sofer, Rutgers University

Workshop: The Pathogenesis of Infectious Diseases: Host-Pathogen Dynamics
Dates: September 23 - 25, 2002
Location: DIMACS Center, CoRE Building, Rutgers University
Organizers: Denise Kirschner, University of Michigan and Alan Perelson, Los Alamos

Working Group Meeting: First Meeting, Adverse Event/Disease Reporting, Surveillance and Analysis
Dates: October 16 - 18, 2002
Location: DIMACS Center, CoRE Building, Rutgers University
Organizers: Donald Hoover, and David Madigan, Rutgers University; Henry Rolka, (CDC)

Subgroup Meeting: Adverse Event/Disease Reporting, Surveillance and Analysis
Dates: February 10, 2003
Location: Marriott Hotel, Newark Airport, Newark, NJ
Organizers: Donald Hoover, and David Madigan, Rutgers University; Henry Rolka, (CDC)

Working Group: Mathematical and Computational Aspects Related to the Study of The Tree of Life
Dates: March 11 - 14, 2003
Location: DIMACS Center, CoRE Building, Rutgers University
Organizers: Melvin F. Janowitz, DIMACS; Francois-Joseph Lapointe, Universite de Montreal; F.R. McMorris, Illinois Institute of Technology; Fred Roberts, DIMACS

Working Group Meeting: Spatio-Temporal and Network Modeling of Diseases
Dates: First Meeting, April 22 - 26, 2003
Location: DIMACS Center, CoRE Building, Rutgers University
Organizers: Bryan Grenfell, Cambridge; Valerie Isham, University College London; Matthew Keeling, Cambridge; Alun Lloyd, Institute for Advanced Study; Denis Mollison, Heriot-Watt University

Working Group Meeting: Data Mining and Epidemiology
Dates: First Meeting, May 22, 2003
Location: DIMACS Center, CoRE Building, Rutgers University
Organizers: Ilya Muchnik, Rutgers University; S. Muthukrishnan, AT&T Labs - Research and Rutgers University; David Ozonoff, Boston University

Working Group on Modeling Social Responses to Bio-terrorism Involving Infectious Agents
Dates: First Meeting, May 29 - 30, 2003
Location: DIMACS Center, CoRE Building, Rutgers University
Organizers: John Glasser, CDC; Ellis McKenzie, NIH; Fred Roberts. Rutgers University

Tutorial: Statistical and Other Analytic Health Surveillance Methods
Dates: June 17 - 20, 2003
Location: DIMACS Center, CoRE Building, Rutgers University
Organizer: David Madigan, Rutgers University; Henry Rolka, CDC; Martin Kulldorff, University of Connecticut

Working Group: The Ecology and Evolution of Influenza and Related Viruses
Dates: June 29 - July 2, 2003
Location: DIMACS Center, CoRE Building, Rutgers University
Organizer: Simon Levin, Princeton University

Working Group: Genetics and Evolution of Pathogens
Dates: November 24 - 25, 2003
Location: DIMACS Center, CoRE Building, Rutgers University
Organizers: Zhilan Feng, Purdue University

Working Group Meeting: Privacy / Confidentiality of Health Data
Date: December 10 - 12, 2003
Location: DIMACS Center, CoRE Building, Rutgers University
Organizer: Rakesh Agrawal, IBM Almaden; Larry Cox, CDC; Joe Fred Gonzalez, CDC; Harry Guess, University of North Carolina

Working Group Meeting: Adverse Event/Disease Reporting, Surveillance and Analysis II
Dates: Second Meeting, February 19 - 20, 2004
Location: DIMACS Center, CoRE Building, Rutgers University
Organizers: Donald Hoover, and David Madigan, Rutgers University; Henry Rolka, (CDC)

Working Group Meeting: Data Mining and Epidemiology
Dates: Second Meeting, March 18 - 19, 2004
Location: DIMACS Center, CoRE Building, Rutgers University
Organizers: James Abello, Rutgers University; Graham Cormode, Rutgers University; Kenton Morgan, University of Liverpool; David Ozonoff, Boston University

Working Group Meeting: Methodologies for Comparing Vaccination Strategies
Dates: May 17 - 20, 2004
Location: DIMACS Center, CoRE Building, Rutgers University
Organizers: John Glasser, CDC and Herbert Hethcote, University of Iowa

Workshop: Genomic Instability in Cancer: Biological and Mathematical Approaches
Dates: June 8 - 9, 2004
Location: Institute for Advanced Study, Princeton, New Jersey
Organizers: Natalia Komarova, Rutgers University and Institute for Advanced Study, and Arnold Levine, Institute for Advanced Study, and Robert Wood Johnson School of Medicine and Dentistry

Working Group: Challenges for Cryptographers in Health Data Privacy
Date: June 30, 2004
Location: DIMACS Center, CoRE Building, Rutgers University
Organizers: Benny Pinkas, HP Labs; Kobbi Nissim, Microsoft Research

Working Group Meeting: Phylogenetic Trees and Rapidly Evolving Diseases
First Meeting: DIMACS Symposium on Phylogenetics and Rapidly Evolving Pathogens
Dates: September 7 - 8, 2004
Location: Aotea Centre, Auckland, New Zealand
Organizers: Allen Rodrigo, University Of Auckland and Mike Steel, University of Canterbury

Workshop: Reticulated Evolution
Dates: September 20 - 21, 2004
Location: DIMACS Center, CoRE Building, Rutgers University
Organizer: Mel Janowitz, DIMACS; Bernard Moret, University of New Mexico; Randy Linder, University of Texas

Working Group: Reticulated Evolution
Dates: September 22, 2004
Location: DIMACS Center, CoRE Building, Rutgers University
Organizer: Mel Janowitz, DIMACS; Bernard Moret, University of New Mexico; Randy Linder, University of Texas

Working Group: Data De-Identification, Combinatorial Optimization, Graph Theory, and the Stat/OR Interface
Date: November 9 - 10, 2004
Location: DIMACS Center, CoRE Building, Rutgers University
Organizers: Larry Cox, CDC; Brenda Latka, DIMACS; Fred Roberts, DIMACS

Working Group Meeting: Adverse Event/Disease Reporting, Surveillance and Analysis III
Date: Third Meeting, March 2, 2005
Location: Bethesda, Maryland
Organizers: Donald Hoover, and David Madigan, Rutgers University; Henry Rolka, (CDC)

Tutorial and Working Group Meeting: Order-theoretic Aspects of Epidemiology
Dates: First Meeting, March 7 - 9, 2005
Location: DIMACS Center, CoRE Building, Rutgers University
Organizers: David Ozonoff, Boston University; Melvin Janowitz and Fred Roberts, Rutgers University

DIMACS Epidemiology Minisymposium
Dates: April 25, 2005
Location: DIMACS Center, CoRE Building, Rutgers University
Organizers: Simon Levin, Princeton University and Fred Roberts, DIMACS, Rutgers University

Workshop: Evolutionary Considerations in Vaccine Use
Dates: June 27 - 29, 2005
Location: DIMACS Center, CoRE Building, Rutgers University
Organizers: Troy Day, Queen's U.; Alison Galvani, Yale U.; Abba Gumel, U. of Manitoba; Claudio Struchiner, Oswaldo Cruz Foundation

Workshop: Economic Epidemiology
Dates: October 24 - 25, 2005
Location: DIMACS Center, CoRE Building, Rutgers University
Organizers: Dave Smith, NIH; and Ramanan Laxminarayan, Resources for the Future

Workshop: The Epidemiology and Evolution of Influenza
Dates: January 25 - 27, 2006
Location: DIMACS Center, CoRE Building, Rutgers University
Organizers: Catherine Macken and Alan Perelson, Los Alamos National Labs

Working Group Meeting: Adverse Event/Disease Reporting, Surveillance and Analysis IV
Date: Fourth Meeting, February 10, 2006
Location: DIMACS Center, CoRE Building, Rutgers University
Organizers: Donald Hoover, and David Madigan, Rutgers University; Henry Rolka, CDC

Working Group Meeting: BioSurveillance Data Monitoring and Information Exchange
Dates: February 22 - 24, 2006
Location: DIMACS Center, CoRE Building, Rutgers University
Organizers: David Madigan, Rutgers University; Colleen Martin and Henry Rolka, CDC

Tutorial on Data Mining and Epidemiology
Dates: March 23 - 24, 2006
Location: DIMACS Center, CoRE Building, Rutgers University
Organizer: James Abello, DIMACS; and Graham Cormode, Bell Laboratories

Workshop: Combinatorial Group Testing
Dates: May 17 - 19, 2006
Location: DIMACS Center, CoRE Building, Rutgers University
Organizers: Ding-zhu Du, University of Texas; and Frank Hwang, Chiatong University

Tutorial: Phylogenetic Trees and Rapidly Evolving Pathogens
Dates: June 19 - 20, 2006
Location: DIMACS Center, CoRE Building, Rutgers University
Organizers: Katherine St. John, The City University of New York

Workshop: Phylogenetic Trees and Rapidly Evolving Pathogens
Dates: June 21- 22, 2006
Location: DIMACS Center, CoRE Building, Rutgers University
Organizers: Allen Rodrigo, University Of Auckland and Mike Steel, University of Canterbury

Working Group Meeting: Phylogenetic Trees and Rapidly Evolving Pathogens II
Dates: Second Meeting: June 23, 2006
Location: DIMACS Center, CoRE Building, Rutgers University
Organizers: Allen Rodrigo, University Of Auckland and Mike Steel, University of Canterbury

Workshop: Facing the Challenge of Infectious Diseases in Africa: The Role of Mathematical Modeling
Dates: September 25 - 27, 2006
Location: University of the Witswatersrand (Wits), Johannesburg, South Africa

Organizers: Dominic Clemence, North Carolina AT&T State University; Wayne Getz, UC Berkeley; Abba Gumel, University of Manitoba; John Hargrove, SACEMA Director; Edward Lungu, University of Botswana; Fred Roberts, DIMACS

Workshop: Models of Co-Evolution of Hosts and Pathogens
Dates: October 9 - 11, 2006
Location: DIMACS Center, CoRE Building, Rutgers University
Organizers: Viggo Andreasen, Roskilde; Andrea Pugliese, Trento

Workshop: Immuno-epidemiology
Dates: December 11 - 13, 2006
Location: DIMACS Center, CoRE Building, Rutgers University
Organizer: Hans Heesterbeek, and Rob de Boer, Universiteit Utrecht, The Netherlands

Workshop: Models/Methodological Problems of Botanical Epidemiology
Dates: March 26 - 28, 2007
Location: DIMACS Center, CoRE Building, Rutgers University
Organizer: Chris Gilligan, Cambridge

Shortcourse: US-Africa Advanced Studies Institute on Mathematical Modeling of Infectious Disease in Africa
Dates: June 11 - 22, 2007
Location: AIMS, Cape Town, South Africa
Organizers: Brenda Latka, (Program Chair), DIMACS; Wayne Getz, UC Berkeley; Abba Gumel, University of Manitoba; Fritz Hahne, AIMS; John Hargrove, SACEMA; Simon Levin, Princeton University; Edward Lungu, University of Botswana; Fred Roberts, DIMACS; and Alex Welte, Wits University

DIMACS Capstone Workshop on Mathematical Modeling of Infectious Diseases in Africa
Dates: June 25 - 27, 2007
Location: Stellenbosch, South Africa
Organizers: Brenda Latka, (Program Chair), DIMACS; Wayne Getz, UC Berkeley; Abba Gumel, University of Manitoba; Fritz Hahne, AIMS; John Hargrove, SACEMA; Simon Levin, Princeton University; Edward Lungu, University of Botswana; Fred Roberts, DIMACS; and Alex Welte, Wits University

Workshop: Game Theoretic Approaches to Epidemiology and Ecology
Dates: October 15 - 17, 2007
Location: DIMACS Center, CoRE Building, Rutgers University
Organizer: Alison Galvani, Yale University

Workshops under development:

Workshops/Working Group Meetings on Modeling of Infectious Diseases

Workshop: Disease Clusters
Organizer: Andrew Lawson, University of South Carolina, and Daniel Wartenberg, Robert Wood Johnson Medical School

Working Group Meeting: Spatio-Temporal and Network Modeling of Diseases(Second Meeting)
Dates: TBA
Location: DIMACS Center, CoRE Building, Rutgers University
Organizers: Bryan Grenfell, Cambridge; Valerie Isham, University College London; Matthew Keeling, Cambridge; Alun Lloyd, North Carolina State University; Denis Mollison, Heriot-Watt University

Workshop: Climate and Disease

Organizers: Don Burke and Derek Cummings, Johns Hopkins University

Workshops/Working Group Meetings on Methodological Issues in Computational and Mathematical Epidemiology

Workshop: Ecologic Inference
Location: DIMACS Center, CoRE Building, Rutgers University
Organizers: Tom Webster, Boston University and Sylvia Richardson, Imperial School of Medicine

Workshop: Spatial Epidemiology and Geographical Information Systems
Organizer: Daniel Wartenberg, Robert Wood Johnson Medical School

Tutorial Program: annual tutorials to introduce researchers/students to various topics in the field.

Tutorial on Network Models in Epidemiology
Organizer: Alun Lloyd, North Carolina State University

2003-2007 Special Focus on Communication Security and Information Privacy

Workshop: Software Security
Dates: January 6 - 7, 2003
Location: DIMACS Center, CoRE Building, Rutgers University
Organizer: Gary McGraw, Cigital

Tutorial: Applied Cryptography and Network Security
Dates: August 4 - 7, 2003
Location: DIMACS Center, CoRE Building, Rutgers University
Organizer: Rebecca Wright, Stevens Institute of Technology

Workshop: Large-scale Internet Attacks

Dates: September 23 - 24, 2003
Location: DIMACS Center, CoRE Building, Rutgers University
Organizer: Vern Paxson, ICSI Center for Internet Research

Working Group: Privacy / Confidentiality of Health Data
Dates: December 10 - 12, 2003
Location: DIMACS Center, CoRE Building, Rutgers University
Organizers: Rakesh Agrawal, IBM Almaden; Larry Cox, CDC; Joe Fred Gonzalez, CDC; Harry Guess, University of North Carolina

Workshop: Privacy-Preserving Data Mining
Dates: March 15 - 16, 2004
Location: DIMACS Center, CoRE Building, Rutgers University
Organizers: Rebecca Wright, Stevens Institute of Technology; Benny Pinkas, HP Labs; Cynthia Dwork, Microsoft

Working Group: Privacy-Preserving Data Mining
Date: March 17, 2004
Location: DIMACS Center, CoRE Building, Rutgers University
Organizers: Rebecca Wright, Stevens Institute of Technology; Benny Pinkas, HP Labs; Cynthia Dwork, Microsoft

Workshop: Electronic Voting -- Theory and Practice
Dates: May 26 - 27, 2004
Location: DIMACS Center, CoRE Building, Rutgers University

Organizers: Markus Jakobsson and Ari Juels, RSA Laboratories

Workshop: Security Analysis of Protocols
Dates: June 7 - 9, 2004
Location: DIMACS Center, CoRE Building, Rutgers University
Organizers: John Mitchell, Stanford and Ran Canetti, IBM Hawthorne

Working Group: Challenges for Cryptographers in Health Data Privacy
Date: June 30, 2004
Location: DIMACS Center, CoRE Building, Rutgers University
Organizers: Benny Pinkas, HP Labs

Workshop: Usable Privacy and Security Software
Dates: July 7 - 8, 2004
Location: DIMACS Center, CoRE Building, Rutgers University
Organizers: Lorrie Cranor, AT&T; Mark Ackerman, University of Michigan; Fabian Monrose, Johns Hopkins University; Andrew Patrick, NRC Canada; Norman Sadeh, Carnegie Mellon University

Working Group: Usable Privacy and Security Software
Date: July 9, 2004
Location: DIMACS Center, CoRE Building, Rutgers University
Organizers: Lorrie Cranor, AT&T; Mark Ackerman, University of Michigan; Fabian Monrose, Johns Hopkins University; Andrew Patrick, NRC Canada; Norman Sadeh, Carnegie Mellon University

Workshop: Cryptography: Theory Meets Practice
Dates: October 14 - 15, 2004
Location: DIMACS Center, CoRE Building, Rutgers University
Organizer: Dan Boneh, Stanford

Workshop: Mobile and Wireless Security
Dates: November 3 - 4, 2004
Location: DIMACS Center, CoRE Building, Rutgers University
Organizer: Bill Arbaugh, University of Maryland

Working Group: Data De-Identification, Combinatorial Optimization, Graph Theory, and the Stat/OR Interface
Dates: November 9 - 10, 2004
Location: DIMACS Center, CoRE Building, Rutgers University
Organizers: Larry Cox, CDC; Brenda Latka, DIMACS; Fred Roberts, DIMACS

Workshop: Theft in E-Commerce: Content, Identity, and Service
Dates: April 14 - 15, 2005
Location: DIMACS Center, CoRE Building, Rutgers University
Organizers: Drew Dean, SRI International, and Markus Jakobsson, Indiana University

Workshop: Security of Web Services and E-Commerce
Dates: May 5 - 6, 2005
Location: DIMACS Center, CoRE Building, Rutgers University
Organizer: Brian LaMacchia, Microsoft

Workshop: Information Security Economics
Dates: January 18 - 19, 2007
Location: DIMACS Center, CoRE Building, Rutgers University
Organizers: Jean Camp, Indiana University, and Alessandro Acquisti, CMU

Workshops under development:

Working Group: Intrusion Detection and Network Security Management Systems
Date: TBA
Location: DIMACS Center, CoRE Building, Rutgers University
Organizers: Tim Gibson, US Govt.; John McHugh, CERT; S. Raj Rajagopalan, HP Labs; Wade Trappe, Rutgers University; Bill Yurcik, NCSA

Workshop: Security and Trust Issues Associated with Ad-Hoc Computing / Pervasive Networking
Date: TBA
Location: DIMACS Center, CoRE Building, Rutgers University
Organizer: S. Raj Rajagopalan, HP Labs

2004-2007 Special Focus on Computation and the Socio-Economic Sciences

Tutorial on Social Choice and Computer Science
Dates: May 10 - 14, 2004
Location: DIMACS Center, CoRE Building, Rutgers University
Organizers: Kevin Chang, University of Illinois; Michel Regenwetter, University of Illinois

Workshop: Electronic Voting: Theory and Practice
Dates: May 26 - 27, 2004
Location: DIMACS Center, CoRE Building, Rutgers University
Organizers: Markus Jakobsson, RSA Laboratories and Ari Juels, RSA Laboratories

Working Group: The Mathematics of Web Search and Meta-Search
Dates: June 19 - 26, 2004
Location: Bertorino, Italy
Organizers: Cynthia Dwork, Microsoft Research; Andrew Gelman, Columbia University; D. Sivakumar, IBM Almaden

Workshop: Computational Issues in Auction Design
Dates: October 7 - 8, 2004
Location: DIMACS Center, CoRE Building, Rutgers University
Organizers: Jayant Kalagnanam, IBM Watson Labs; Eric Maskin, School of Social Science, Institute for Advanced Study; David Parkes, Harvard University; Aleksandar Pekec, Fuqua School of Business, Duke; Michael Rothkopf, Rutgers University

Workshop: Bounded Rationality
Dates: January 31 - February 1, 2005
Location: DIMACS Center, CoRE Building, Rutgers University
Organizers: Lance Fortnow, University of Chicago; Richard McLean, Rutgers University; Daijiro Okada, Rutgers University

Workshop: Markets as Predictive Devices (Information Markets)
Dates: February 2 - 4, 2005
Location: DIMACS Center, CoRE Building, Rutgers University
Organizers: Robin Hanson, George Mason University; John Ledyard, California Institute of Technology; David Pennock, Overture Services

Workshop: Large-Scale Games
Dates: April 17 - 19, 2005
Location: Evanston Campus, Northwestern University, Evanston, Illinois
Organizers: Lance Fortnow, University of Chicago; Rakesh Vohra, Northwestern University

Workshop: Yield Management and Dynamic Pricing
Dates: August 3 - 5, 2005

Location: DIMACS Center, CoRE Building, Rutgers University
Organizers: James Dana, Kellogg School of Management, Northwestern; Brenda Dietrich, IBM Watson Labs

Workshop: Economic Epidemiology
Dates: October 24 - 25, 2005
Location: DIMACS Center, CoRE Building, Rutgers University
Organizers: Dave Smith, NIH; and Ramanan Laxminarayan, Resources for the Future

Workshop: Polyhedral Combinatorics of Random Utility
Dates: May 24 - 26, 2006
Location: DIMACS Center, CoRE Building, Rutgers University
Organizers: Jean-Paul Doignon, Univ. Libre de Bruxelles; Aleksandar Pekec, Fuqua School of Business, Duke

Workshop: Information Security Economics
Dates: January 18 - 19, 2007
Location: DIMACS Center, CoRE Building, Rutgers University
Organizers: Jean Camp, Indiana University, and Alessandro Acquisti, CMU

Workshop: Auctions with Transaction Costs
Dates: March 22 - 23, 2007
Location: DIMACS Center, CoRE Building, Rutgers University
Organizers: Eric Rasmusen, Indiana University; Michael Rothkopf, Rutgers University; Tuomas Sandholm, Carnegie Mellon University

Workshops under development:

Working Group: Computational Analysis of Dynamic Social Networks
Dates: TBA
Location: DIMACS Center, CoRE Building, Rutgers University
Organizers: Tanya Berger-Wolf, University of New Mexico

2004-2008 DIMACS/BioMaPS/MB Center Special Focus on Information Processing in Biology

Short Course: A Field Guide to GenBank and NCBI Molecular Biology Resources
Dates: March 1 - 2, 2005
Location: DIMACS Center, CoRE Building, Rutgers University
Organizer: Tamar Barkay, Rutgers; Paul Ehrlich, BIOMAPS Institute; Mel Janowitz, DIMACS; Tara Matise, Rutgers

Workshop on Biomolecular Networks: Topological Properties and Evolution
Dates: May 11 - 13, 2005
Location: DIMACS Center, CoRE Building, Rutgers University
Organizers: Cenk Sahinalp, Case Western and Petra Berenbrink, Simon Fraser

BioMaPS/DIMACS/MBBC/PMMB/SYCON Short Course: Molecular Mechanisms and Models of Bacterial Signal Transduction
Dates: June 6 - 10, 2005
Location: DIMACS Center, CoRE Building, Rutgers University
Organizers: Eduardo Sontag, Rutgers University, and Ann Stock, UMDNJ/HHMI

Workshop on Information Processing by Protein Structures in Molecular Recognition
Dates: June 13 - 14, 2005
Location: DIMACS Center, CoRE Building, Rutgers University

Organizer: Bhaskar DasGupta, University of Illinois at Chicago, Jie Liang, University of Illinois at Chicago

Workshop on Detecting and Processing Regularities in High Throughput Biological Data
Dates: June 20 - 22, 2005
Location: DIMACS Center, CoRE Building, Rutgers University
Organizer: Laxmi Parida, IBM T J Watson Research

Workshop on Machine Learning Approaches for Understanding Gene Regulation
Dates: August 15 - 17, 2005
Location: DIMACS Center, CoRE Building, Rutgers University
Organizers: Christina Leslie and Chris Wiggins, Columbia University

Working Group on DNA Barcode of Life
Date: September 26, 2005
Location: DIMACS Center, CoRE Building, Rutgers University
Organizers: Rebecka Jornsten, Rutgers University, David Madigan, Rutgers University, and Fred Roberts, DIMACS

Working Group on Evolution of Gene Regulatory Logic
Dates: January 6 - 8, 2006
Location: Santa Fe Institute, Santa Fe, New Mexico
Organizers: Tanya Berger-Wolf, University of New Mexico and David Krakauer, Santa Fe Institute

Workshop on Data Mining, Systems Analysis, and Optimization in Neuroscience
Dates: February 15 - 17, 2006
Location: University of Florida, Gainseville, Florida
Organizers: W. Art Chaovalitwongse, Rutgers University; Leonidas D. Iasemidis, Arizona State University; Panos Pardalos, University of Florida

Short Course: A Field Guide to GenBank and NCBI Molecular Biology Resources
Dates: March 2, 2006
Location: UMDNJ, Newark, NJ
Organizer: Nicholas Beckloff, UMDNJ, beckloni@umdnj.edu
Co-Organizers: Tamar Barkay, Rutgers; Paul Ehrlich, BIOMAPS Institute; Mel Janowitz, DIMACS; Tara Matise, Rutgers

DARPA Workshop on State-Dependent Delays in Regulatory Networks
Dates: March 2 - 3, 2006
Location: DIMACS Center, CoRE Building, Rutgers University
Organizers: Tim Buchman, Washington University; Jon Lorsch, John Hopkins University; Konstantin Mischaikow, Georgia Institute of Technology

Workshop on Computational/Experimental Approaches to Protein Defects in Human Disease
Dates: April 20 - 21, 2006
Location: DIMACS Center, CoRE Building, Rutgers University
Organizers: Jean Baum, Rutgers University and Barbara Brodsky, UMDNJ

Workshop: Sequence, Structure and Systems Approaches to Predict Protein Function
Dates: May 3 - 5, 2006
Location: DIMACS Center, CoRE Building, Rutgers University
Organizers: Anna Panchenko, NIH; Teresa Przytycka, NIH; Mona Singh, Princeton University

Workshop: Clustering Problems in Biological Networks
Dates: May 9 - 11, 2006
Location: DIMACS Center, CoRE Building, Rutgers University

Organizers: Sergiy Butenko, Texas A&M; W. Art Chaovalitwongse, Rutgers University; and Panos Pardalos, University of Florida

Short Course: Exploring 3D Molecular Structures Using NCBI Tools
Dates: May 16 - 17, 2006
Location: DIMACS Center, CoRE Building, Rutgers University
Organizers: Tamar Barkay, Rutgers; Nicholas Beckloff, UMDNJ; Paul Ehrlich, BIOMAPS Institute; Mel Janowitz, DIMACS; Tara Matise, Rutgers

BioMaPS/DIMACS/MBBC/PMMB Short Course: Biological Development
Dates: May 22 - 26, 2006
Location: Life Science Auditorium, Life Sciences Building, Busch Campus, Rutgers University
Organizers: Richard Padgett, Rutgers University; and Andrei Ruckenstein, Rutgers University

Workshop: The DNA Barcode Data Analysis Initiative (DBDAI): Developing Tools for a New Generation of Biodiversity Data
Dates: July 6 - 8, 2006
Location: The National Museum of Natural History, Paris, France
Organizers: Javier Cabrera, Rutgers University; Fred Roberts, DIMACS; David Schindel, National Museum of Natural History; Michel Veuille, Muséum National d'Histoire Naturelle

Workshop: Machine Learning Techniques in Bioinformatics
Dates: July 11 - 12, 2006
Location: DIMACS Center, CoRE Building, Rutgers University
Organizers: Dechang Chen, Uniformed Services University of the Health Sciences; Xue-Wen Chen, University of Kansas; and Sorin Draghici, Wayne State University

Working Group on Computational Tumor Modeling
Dates: August 2, 2006
Location: DIMACS Center, CoRE Building, Rutgers University
Organizers: David Axelrod, Rutgers University, and Thomas S. Deisboeck, Harvard Medical School

Workshop on Computational Tumor Modeling
Dates: August 3 - 4, 2006
Location: DIMACS Center, CoRE Building, Rutgers University
Organizers: David Axelrod, Rutgers University, and Thomas S. Deisboeck, Harvard Medical School

Workshop on Dialogue on Reverse Engineering Assessment and Methods (DREAM)
Dates: September 7 - 8, 2006
Location: Wave Hill Conference Center, New York, NY
Organizers: Gustavo Stolovitzky, IBM; Andrea Califano, Columbia University; and Jim Collins, Boston University

Workshop on Discrete Mathematical Problems in Computational Biomedicine
Dates: April 18 - 20, 2007
Location: DIMACS Center, CoRE Building, Rutgers University
Organizers: Jie Wang, University of Massachusetts; and Weili Wu, University of Texas

Workshop: Computational Methods for Predicting Outcome in Cancer
Dates: May 29 - 30, 2007
Location: DIMACS Center, CoRE Building, Rutgers University
Organizers: Dechang Chen, Uniformed Services University of the Health Sciences; Xue-Wen Chen, University of Kansas; and Donald Henson, The George Washington University Cancer Institute

Workshops under development:

Workshops on Computer Science, Engineering and Biology: Applications and Analogies

Workshop on Nanotechnology and Biology
Dates: TBA
Location: DIMACS Center, CoRE Building, Rutgers University
Organizers: Stan Dunn, Casimir Kulikowski, and S. Muthukrishnan, Rutgers University

Workshop on Control, Communication, and Computing in Biology
Dates: TBA
Location: DIMACS Center, CoRE Building, Rutgers University
Organizers: Eduardo Sontag, Rutgers University and Bhaskar DasGupta, U. of Illinois Chicago

Workshop on The Mechanism and Applications of the RNA Interference Process
Dates: TBA
Location: DIMACS Center, CoRE Building, Rutgers University
Organizers: Isidore Rigoutsos, IBM and Gregory Stephanopoulos, MIT

Short Course: Protein Data Bank
Dates: TBA (Tentative 2007)
Location: DIMACS Center, CoRE Building, Rutgers University
Organizer: Paul Ehrlich, BIOMAPS Institute and Mel Janowitz, DIMACS

Workshops on Biological Circuits and Cellular Signaling

Workshop on Dynamics of Biological Networks
Dates: TBA
Location: DIMACS Center, CoRE Building, Rutgers University
Organizer: Eduardo Sontag, Rutgers University

Workshops on Proteomics

Workshop on Implications of Mathematical Models of Infection and Molecular Modeling of Hepatitis B Virus
Dates: TBA
Location: DIMACS Center, CoRE Building, Rutgers University
Organizers: Eddy Arnold and Kalyan Das, Rutgers University

Workshops on Bioinformatics/Computational Biomedicine

Workshop: Trends in Bioinformatics: The Interplay between Experimental Biology and Theoretical Computer Science
Dates: TBA
Location: DIMACS Center, CoRE Building, Rutgers University
Organizer: Yi Pan, Georgia State University

Workshops on TCS and Neuroscience

Workshop: Neural Imaging
Dates: TBA
Location: DIMACS Center, CoRE Building, Rutgers University
Organizers: Rajesh Sachdeo, St. Peter's University Hospital, and Leonidas Iasemidis, Arizona State University

2006-2008 DIMACS/Georgia Tech Special Focus on Discrete Random Systems

Conference on Probabilistic Combinatorics & Algorithms: a Conference in Honor of Joel Spencer's 60th Birthday
Dates: April 24 - 25, 2006
Location: DIMACS Center, CoRE Building, Rutgers University
Organizers: Noga Alon, Tel Aviv University and the Institute for Advanced Study; Janos Pach, NYU and Renyi Institute, Budapest, Hungary; Aravind Srinivasan, University of Maryland; and Prasad Tetali, Georgia Tech

Discrete Random Systems Special Focus Kickoff Lecture
Dates: October 5, 2006
Time: 11:25 am - 12:05 pm
Location: DIMACS Center, CoRE Building, Rutgers University
Speaker: Gregory Sorkin, IBM Research
Title: Phase Transitions in Optimization Problems, and Algorithmic Implications

Workshop: Properties of Large Graphs: From Combinatorics to Statistical Physics and Back
Dates: October 16 - 20, 2006
Location: DIMACS Center, CoRE Building, Rutgers University
Organizers: László Lovász, Microsoft Research and Eötvös Loránd University; and Benny Sudakov, Princeton University

Georgia Tech Kickoff for the Special Focus on Discrete Random Systems
Dates: November 20, 2006
Location: Georgia Institute of Technology
Organizers: Dana Randall, Georgia Tech

Workshop: Complex Networks and their Applications
Dates: January 22 - 24, 2007
Location: Georgia Institute of Technology
Organizers: Fan Chung Graham, UCSD, Ashish Goel, Stanford University, Milena Mihail, Georgia Tech, and Chris Wiggins, Columbia University

Workshop: Phase Transitions in Random Structures and Algorithms
Dates: March 19 - 23, 2007
Location: Georgia Institute of Technology
Organizers: Gregory Sorkin, IBM Research, Eric Vigoda, Georgia Institute of Technology

Working Group: Current Topics in Markov Chains and Phase Transitions
Dates: March 26 - 30, 2007
Location: Georgia Institute of Technology
Organizers: Dana Randall and Eric Vigoda, Georgia Institute of Technology

Workshop: Markov Chain Monte Carlo: Synthesizing Theory and Practice
Dates: June 4 - 7, 2007
Location: DIMACS Center, CoRE Building, Rutgers University
Organizers: Jim Fill, Johns Hopkins University

Workshop on Puzzling Mathematics and Mathematical Puzzles: a Gathering in Honor of Peter Winkler's 60th Birthday
Dates: June 8 - 9, 2007
Location: DIMACS Center, CoRE Building, Rutgers University
Organizers: Graham Brightwell, London School of Economics; Dana Randall and Tom Trotter, Georgia Institute of Technology

Workshops under development:

Working Group: Phase Transitions: Heuristic and Rigorous Approaches, and Beyond
Dates: Tentative August 2007
Location: DIMACS Center, CoRE Building, Rutgers University
Organizers: Riccardo Zecchina, International Centre for Theoretical Physics (ICTP), Trieste; Gregory Sorkin, IBM Research

6.12 Advisory Board

- Douglas Arnold, IMA
- Jennifer Chayes, Microsoft Corp.
- Brenda Dietrich, IBM Research
- Cynthia Dwork, Microsoft Research
- Ronald Graham, University of California, San Diego
- Juris Hartmanis, Cornell University
- Richard Karp, University of California, Berkeley and International Computer Science Institute
- Jon Kettenring, Drew University
- Daniel Kleitman, M.I.T.
- Laszlo Lovasz, Microsoft Corp.
- Joseph O'Rourke, Smith College
- Christos Papadimitriou, University of California - Berkeley
- Eva Tardos, Cornell University
- Edward Wegman, George Mason University
- Mihalis Yannakakis, Columbia