

# IAS

Institute for Advanced Study



Report for the Academic Year  
2006–2007

It is fundamental in our purpose, and our express desire, that in the appointments to the staff and faculty, as well as in the admission of workers and students, no account shall be taken, directly or indirectly, of race, religion, or sex. We feel strongly that the spirit characteristic of America at its noblest, above all the pursuit of higher learning, cannot admit of any conditions as to personnel other than those designed to promote the objects for which this institution is established, and particularly with no regard whatever to accidents of race, creed, or sex.



*Extract from the letter addressed by the  
Institute's Founders, Louis Bamberger and  
Caroline Bamberger Fuld, to the first  
Board of Trustees, dated June 4, 1930.*

*Newark, New Jersey*



*The Institute for Advanced Study exists to encourage and support fundamental research in the sciences and humanities—the original, often speculative, thinking that produces advances in knowledge that change the way we understand the world.*

# Institute for Advanced Study



**THE SCHOOL OF HISTORICAL STUDIES**, established in 1949 with the merging of the School of Economics and Politics and the School of Humanistic Studies, is concerned principally with the history of Western European, Near Eastern, and East Asian civilizations. The School actively promotes interdisciplinary research and cross-fertilization of ideas.



**THE SCHOOL OF MATHEMATICS**, established in 1933, was the first School at the Institute for Advanced Study. Several central themes in mathematics of the twentieth and twenty-first centuries owe their major impetus to discoveries that have taken place at the Institute. Today, the School is an international center for research on mathematics and computer science. The School sponsors, jointly with Princeton University, the Program for Women and Mathematics.



**THE SCHOOL OF NATURAL SCIENCES**, established in 1966, supports research in broad areas of theoretical physics, astronomy, and systems biology. Areas of current interest include elementary particle physics, string theory, quantum theory, and quantum gravity; investigating the origin and composition of the universe; and conducting research at the interface of molecular biology and the physical sciences. The School sponsors Prospects in Theoretical Physics, a program for graduate students and postdoctoral scholars.



**THE SCHOOL OF SOCIAL SCIENCE**, founded in 1973, takes as its mission the analysis of societies and social change, and is devoted to a multi-disciplinary, comparative, and international approach to social research and the examination of historical and contemporary problems.



**SPECIAL PROGRAMS** include the Program in Interdisciplinary Studies, which explores different ways of viewing the world; the Artist-in-Residence Program, which offers a musical presence within the Institute community; Director's Visitors; and the IAS/Park City Mathematics Institute (PCMI), an outreach program that serves to increase awareness of the roles of professionals in all mathematics-based occupations.



# Institute for Advanced Study

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# Background and Purpose

The Institute for Advanced Study was founded in 1930 with a major gift from New Jersey businessman and philanthropist Louis Bamberger and his sister, Caroline Bamberger Fuld, who wished to use their fortunes to make a significant and lasting contribution to society. They sought the advice of educator Abraham Flexner, who developed the concept of the Institute as a community of scholars whose primary purpose would be the pursuit of advanced learning and scholarly exploration. The Institute for Advanced Study has remained committed to its founding principles for more than seventy-five years, and its record of definitive scholarship and scientific achievement is unsurpassed.

The Institute fills a unique role in postgraduate education and scientific and scholarly research. As “the university to universities,” in the words of Trustee Vartan Gregorian, the Institute serves all colleges and universities by providing a place where scholars can hone their skills and do their best work, thereby adding substantially to their ability to contribute as both teachers and scholars to the academic institutions where they base their careers. For young scholars just entering the academic world, an opportunity to work at the Institute can set the direction for lifelong research interests and thereby determine professional careers. The Institute provides more mature scholars with the opportunity to take new directions in their research or to complete a major piece of work away from the many obligations of working life at a university. At a time when pure research and scholarly activities are undervalued, the opportunities that the Institute provides have never been more necessary.

The Institute’s foremost objective is the advancement of knowledge and the deepening of understanding across a broad range of the humanities, sciences, and social sciences.

One of the Institute’s unique strengths is its permanent Faculty of twenty-seven eminent scholars, whose broad interests and extensive ties to the larger academic world are reflected in their own work and also in the guidance and direction they provide to the Institute’s visiting Members. The Faculty defines the major themes and questions that become the focus of each School’s seminars and other activities, and the Faculty selects and works closely with visiting Members. Small in number and organized into four Schools (Historical Studies, Mathematics, Natural Sciences, and Social Science), the Faculty and Members can interact with one another without any departmental or disciplinary barriers.

Each year the Institute awards fellowships to some 190 visiting Members from about one hundred universities and research institutions throughout the world. The Institute’s more than 5,000 former Members hold positions of intellectual and scientific leadership in the United States and abroad. Some twenty-two Nobel Laureates, and thirty-four out of forty-eight Fields Medalists have been Institute Faculty or Members. Many winners of the Wolf or MacArthur prizes have also been affiliated with the Institute. The Institute does not receive income from tuition or fees; resources for operations come from endowment income, grants from private foundations and government agencies, and gifts from corporations and individuals.

*As “the university to universities,” in the words of Trustee Vartan Gregorian, the Institute serves all colleges and universities by providing a place where scholars can hone their skills and do their best work, thereby adding substantially to their ability to contribute as both teachers and scholars to the academic institutions where they base their careers.*

# Report of the Chairman

I am honored to present here my final report as the Chairman of the Board of Trustees. I wrote my first report in 1987, fully mindful of the fine record of leadership set by my predecessors. Since its founding in 1930, the Institute for Advanced Study has stood for excellence and integrity. As Chairman for the last twenty-one years, I have sought to create a balance between the expectations and aspirations of the academic community and the practical capacity of the Board to make their hopes possible.

I am confident that my successors, Board Vice Chairman Martin L. Leibowitz, who will serve as Chairman for one year before Charles Simonyi, current President of the Corporation, becomes Chairman in October 2008, will further strengthen and facilitate the Institute's resolve to support the disinterested pursuit of knowledge.

Much of my thinking as Chairman was formed as chair of the Planning and Review Committee that undertook the Decadal Review in 1984–86. The Institute has been reviewed almost every ten years since the 1950s. This year the Institute is embarking on another Decadal Review that will undoubtedly lead to the further fortification of its resources, facilities, and intellectual direction. While a Decadal Review looks both at the practicalities of the institution in terms of finance, administration, and physical needs, as well as the goals of the Schools, the driving force is the support of scholarship.

Founding Director Abraham Flexner conceived of the Institute as a place where neither the Board nor the Director but rather the quality of the scholars would be dominant. Seventy-seven years later, the Institute has remained remarkably true to Flexner's vision. Everything turns on the quality of the Institute's academic colleagues. Because of the strength of its international reputation and the eminence of the Faculty at the time of each appointment, there is a momentum that allows the Institute to retain its standards. The important thing is not to allow those principles to erode over time, and in this I think the Institute's track record has been remarkable.

In the last year, we witnessed a number of professorial changes in the Schools.

We mourned the death of Clifford Geertz, the founding Professor and standard-bearer of the School of Social Science, since its inception in 1973. Dr. Geertz's landmark contributions to social and cultural theory continue to be influential not only among anthropologists, but also among geographers, ecologists, political scientists, humanists, and historians. Professor Michael Walzer, one of the foremost political theorists of our time, retires from the School of Social Science, effective July 1, 2007, becoming Professor Emeritus. Danielle Allen, formerly Dean of the Humanities Division of the University of Chicago, joins the Institute in July as Dr. Walzer's successor. Awarded a MacArthur Fellowship in 2002, Dr. Allen has contributed work in democratic theory, political sociology, the linguistic dimensions of politics, and the history of political thought that is of great importance to society.

Robert Langlands, Hermann Weyl Professor in the School of Mathematics, whose work continues to have a wide impact on mathematics and parts of theoretical physics, also retires as of July after thirty-five years on the Faculty becoming Professor Emeritus. Peter Sarnak, the Eugene Higgins Professor of Mathematics at Princeton University and a frequent Member in the School of Mathematics, joins the Faculty of the School of Mathematics, effective July 1, 2007. Dr. Sarnak, who has made major contributions to many areas of mathematics, particularly number theory, is noted for his considerable insights and generosity as a mentor and colleague.

In the School of Natural Sciences, Scott Tremaine, formerly Charles A. Young Professor at Princeton University, where he had served as Chair of the Department of Astrophysical Sciences since 1998, succeeded the late John Norris Bahcall (1934–2005) as the Richard Black Professor of Astrophysics as of January 1, 2007.



Dr. Tremaine's appointment strengthens the Institute's unsurpassed reputation as a center for astrophysical research that shapes the careers of young astrophysicists. The appointment of particle physicist Nima Arkani-Hamed, Professor of Physics at Harvard University, whose theoretical research will play a major role in understanding the experimental developments of the Large Hadron Collider, will take effect on January 1, 2008.

Financially, the Institute is on strong footing with a \$680 million endowment from which the Institute draws income to cover the majority of its expenses. In order to preserve the Institute's mission for future generations, the Institute is in the midst of a capital campaign to raise \$100 million, of which \$72 million has thus far been raised.

It would have been impossible to bring about the progress that has been achieved in the last twenty-one years without the remarkable group of Trustees the Institute has been able to attract. The extraordinary quality of the Board was recently enhanced by the May appointment of Andrew J. Wiles, Eugene Higgins Professor of Mathematics and Chair of the Department of Mathematics at Princeton University, as Academic Trustee for the School of Mathematics. A world-renowned mathematician and frequent Member of the School of Mathematics, Dr. Wiles is perhaps best known for his proof of Fermat's Last Theorem, for which he was honored by the International Mathematical Union in 1998.

Dr. Wiles succeeds James Arthur, who served as Academic Trustee for the School of Mathematics from 1997 until the end of his term in May. One of the world's foremost researchers in automorphic forms and Lie group representations and a frequent Member in the School, Dr. Arthur was an extraordinarily effective advocate on behalf of the School of Mathematics, as well as mathematics in the academic world and in society as a whole. At its May meeting, the Board also accepted the resignation of Ronaldo Schmitz, who joined the Board in 1992 and was elected Trustee Emeritus. During his fifteen years of service on the Board, Dr. Schmitz, a former member of the Board of Managing Directors of Deutsche Bank AG, was instrumental in promoting the international character and high standing of the Institute and acted as a strong supporter of the Institute's role in the advancement of research.

The Institute remains small when measured in terms of the size of its immediate academic community, but its intellectual weight is great and its influence on science and scholarship extraordinary. The Institute obviously cannot cover every academic field. Nor do I think it is the answer to every intellectual challenge that faces mankind. But I do think that to have a place that can offer the best minds the opportunity to pursue their scholarship at the highest level without burdens of administration or degree-granting or even teaching, to allow these individuals to set their own pace, to decide themselves how they can achieve their highest objectives, and then facilitate their actions, is an exceptional model. The Institute is as close to ideal for scholarship as anything I have seen, and I am immensely honored to have served alongside my colleagues on the Board, as well as with the Directors, Faculty, and staff, who on a daily basis enable the advancement of knowledge and the structure of thought and research for future generations.

James D. Wolfensohn  
Chairman, Board of Trustees

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# Report of the Director

Every year at the Institute brings with it significant changes and points of transition and this is certainly true of the academic year just past. Most obviously, approaching Fuld Hall along Einstein Drive, one could monitor the progress of the construction of the extension to Bloomberg Hall to house The Simons Center for Systems Biology, scheduled for opening at the end of October 2007. The Center comprises the group of outstanding young scientists, with diverse backgrounds, particularly in physics and mathematics, and some senior visitors that has been built up over the last four years under the leadership of Arnold Levine to work on aspects of genomics. More than any other area of study at the Institute, this is one where pure intellectual inquiry leads to results with applications of practical importance in the development of vaccines for AIDS and influenza as well as understanding the incidence of various cancers. Bringing all members of the group together under the same roof as the rest of the School of Natural Sciences will both facilitate interactions within the group and with other Members of the Institute.

Also in the School of Natural Sciences, Scott Tremaine, formerly Charles A. Young Professor and Chair of the Department of Astrophysical Sciences at Princeton University, joined us as Richard Black Professor of Astrophysics in the School of Natural Sciences at the beginning of January. A specialist in astrophysical dynamics, including the formation and evolution of planetary systems, comets, black holes, star clusters, galaxies, and galaxy systems, Professor Tremaine succeeds the late John Bahcall. His appointment will ensure the continuance of the Institute's unsurpassed reputation as a center for astrophysical research and the development of young astrophysicists.

In theoretical physics, the third area of research within the School of Natural Sciences, we announced the appointment of particle physicist Nima Arkani-Hamed, Professor of Physics at Harvard University, who joins the Faculty at the beginning of January 2008. One of the leading particle physics phenomenologists of his generation, Professor Arkani-Hamed will ensure that those working on fundamental physics at the Institute will be well positioned to take advantage of the new experimental results that are expected to be produced by the Large Hadron Collider at CERN in Geneva, beginning in 2008. These should bear on the validity of ideas about supersymmetry, the Higgs boson, and perhaps even string theory, developed here and elsewhere.

Transition has been most marked in the School of Social Science. Clifford Geertz, the founding Professor and guiding spirit of the School of Science since its inception in 1973, died on October 30, 2006. Eighty years old, he was still a vital force in the Institute's daily life, as any visitor to the Social Science lunch table would have found. On March 3, Wolfensohn Hall was full to overflowing for a memorial for Professor Geertz, in which he was brought alive in affectionate descriptions, from the diverse standpoints of the many distinguished scholars he had influenced; it was an occasion that embodied the essence of his own approach to culture.

Michael Walzer, political theorist and moral philosopher, retired as UPS Foundation Professor in the School of Social Science after twenty-seven years' service. One of America's foremost political thinkers, his work addresses a wide variety of topics, including political obligation, just and unjust war, nationalism and ethnicity, economic justice and the welfare state.

Appointed to succeed Professor Walzer is Danielle Allen, formerly Dean of the Humanities Division and Professor of Classical Languages and Literatures, Political Science, and the Committee on Social Thought at the University of Chicago, who joins the Institute at the beginning of July. Trained both as a classicist and a political theorist, her particular interests are democratic theory, political sociology, the linguistic dimensions of politics, and the history of political thought, and she is widely known for her work on justice and citizenship in ancient Athens and its application to modern America.

The Institute was fortunate to have Lakhdar Brahimi, former Special Advisor to the Secretary-General of the United Nations and Algerian Foreign Minister, as a Director's Visitor and a participant in the School of Social Science's program on "The 'Third World' Now." He gave the first in the Institute's new annual lecture series,

Lectures on Public Policy, in March, when he spoke about “Afghanistan and Iraq: Failed States or Failed Wars?” We are very pleased that he will remain at the Institute for a second year.

In the School of Mathematics, Robert Langlands, Hermann Weyl Professor, also retired after thirty-five years on the Faculty. Professor Langlands’s visionary work has a deep influence across a broad sweep of mathematics and parts of theoretical physics. Like Professor Walzer, he will remain an active member of our community.

As Professor Langlands retires, Peter Sarnak will join the Faculty of the School of Mathematics from the beginning of July. He is the Eugene Higgins Professor of Mathematics at Princeton University, and he will continue to hold this appointment in conjunction with his professorship at the Institute. A frequent Member in the School in recent years, Peter combines distinction as one of the world’s leading number theorists with outstanding talents as a mentor of younger mathematicians fostering interactions across disciplinary boundaries.

The past year also saw the departure of Jon Magnussen, who served as the Institute’s Artist-in-Residence for the past seven years and who has accepted the position of Director of Education at the Honolulu Symphony. Composer Paul Moravec, the recipient of the 2004 Pulitzer Prize in Music, has been appointed as his successor, from July 2007. Dr. Moravec will build upon and develop our Artist-in-Residence program, which under Jon Magnussen has established a strong reputation as a promoter of challenging and provocative music and music scholarship, while also utilizing this opportunity to develop his own work.

In terms of staff, the Institute has been fortunate to recruit Dr. Ashvin Chhabra, formerly Managing Director and Head of Wealth Management Strategies and Analytics in the Global Private Client Group at Merrill Lynch, who joined the Institute in May as its first Chief Investment Officer. Dr. Chhabra will work closely with the Board’s Finance Committee and John Masten, Associate Director for Finance and Administration, in managing the Institute’s endowment. With Dr. Chhabra’s appointment and in many other ways, the Institute continues to seek to strengthen its endowment. Because we do not receive tuition or fees but rather provide grants or Fellowship to those who come to work here, we depend primarily on our endowment, which provides about 75 percent of the expenses for the Institute’s core activities. We are very grateful for the generosity of all those who have provided support for the work of the Institute.

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As we begin the new academic year, important changes lie ahead. In the spring, James Wolfensohn announced that next October he would retire as Chairman of the Board after twenty-one years’ service. Jim Wolfensohn has been an essential force in the development of the Institute, deeply committed to its mission of advancing the disinterested pursuit of knowledge. His vision has guided our growth and evolution as an institution, ensuring the maintenance of the highest standards of excellence and the relevance of the Institute’s work.

We are extremely fortunate that Jim will be succeeded by Martin Leibowitz, currently Vice Chairman, who will serve for a year before Charles Simonyi, current President of the Corporation, becomes Chairman in October 2008. We are equally delighted that James Wolfensohn will remain very involved in the work of the Institute as a member of the Board of Trustees.

Peter Goddard  
Director



## RECORD OF EVENTS

In addition to the calendar of events sponsored by the Office of the Director in the academic year 2006–2007, listed below, the Institute for Advanced Study also offered a series of events and activities for Members, Visitors, and their families. These included the Institute Film Series, AMIAS Movie Mondays, play readings, ballroom dancing classes, yoga, tennis lessons, trips to local places of interest, and activities for children in the Institute community.

### September 27

Welcome Reception for Members/Visitors and Spouses/Partners

### October 4

Faculty Lecture ♦ **Nathan Seiberg**, Professor, School of Natural Sciences ♦ *The World's Largest Experiment*

### October 6

Friends Culture and Cuisine Talk ♦ **Darra Goldstein**, Williams College ♦ *Feeding Desire: The Orchestration of the Meal*

### October 8

The Princeton Symphony Orchestra's Sunday Afternoon Chamber Series ♦ **Ariadne Trio** ♦ **Basia Danilow**, violin; **Peter Sanders**, cello; **Albert Stanziano**, piano

### October 11

Friends Forum ♦ **Arnold Levine**, Professor, School of Natural Sciences ♦ *Searching the Human Genome for Clues to the Origins of Cancer*

### October 16

Friends Fireside Chat ♦ **Amory Lovins**, The Rocky Mountain Institute ♦ *Winning the Oil Endgame*

### October 20 and 21

*Recent Pasts 20/21* Music Series ♦ *A Gate Into Infinity: Music from a Modern Japan* ♦ Works by Somei Satoh, Toru Takemitsu, Toshio Hosokawa, and Toshiro Mayuzumi performed by **FLUX Quartet** with **Steven Gosling**, piano

### October 24

The Sensuous in Art Lecture Series ♦ **Anne Wagner**, University of California, Berkeley ♦ *Behaving Globally*

### October 27

Faculty Lecture ♦ **Eric Maskin**, Albert O. Hirschman Professor, School of Social Science ♦ *Why Haven't Global Markets Reduced Inequality?*

### November 1

Friends Forum ♦ **Jonathan Israel**, Professor, School of Historical Studies ♦ *Spinoza. Or the Failed Jewish Businessman Who Changed the World through Philosophy*

### November 4

Concert Workshop, Libretto Reading, and Discussion ♦ **Tarik O'Regan** and **Tom Phillips** ♦ *Heart of Darkness*, American Opera Projects

### November 17

A Program to Mark the Centenary Year of the Birth of Kurt Gödel ♦ Talks by **John Burgess**, Princeton University ♦ *Philosophy's Gödel Problem* ♦ **John W. Dawson, Jr.**, The Pennsylvania State University ♦ *At Odds with the Zeitgeist: Kurt Gödel's Life and Work* ♦ **Solomon Feferman**, Stanford University ♦ *The Nature and Significance of Gödel's Incompleteness Theorems* ♦ **Karl Sigmund**, University of Vienna ♦ *Gödel's Vienna* ♦ **Avi Wigderson**, Herbert H. Maass Professor, School of Mathematics ♦ *Kurt Gödel and Computer Science* ♦ Panel discussion moderated by **Juliette Kennedy**, University of Helsinki

### December 3

The Princeton Symphony Orchestra's Sunday Afternoon Chamber Series ♦ *Music for Flute and Harp* ♦ **Karen Purpura**, flute; **Barbara Biggers**, harp

### December 5

Faculty Lecture ♦ **Joan Scott**, Harold F. Linder Professor, School of Social Science ♦ *Cover-Up: French Gender Equality and the Islamic Headscarf*

### December 7

The Sensuous in Art Lecture Series ♦ **Stephen Campbell**, The Johns Hopkins University ♦ *Invisible Nymphs Revisited: Materialism, Sensation, and Human Nature in Venetian Art, 1500–1520*

### January 9

Welcome Reception for Members/Visitors and Spouses/Partners

### January 28

The Princeton Symphony Orchestra's Sunday Afternoon Chamber Series ♦ *An Unlikely Pairing* ♦ **Kiri Murakami**, violin; **Seth Baer**, bassoon; **Karen Faust Baer**, piano

### January 31

Faculty Lecture ♦ **Enrico Bombieri**, IBM von Neumann Professor, School of Mathematics ♦ *The Mathematical Infinity*

### February 16 and 17

*Recent Pasts 20/21* Music Series ♦ *A 21st-Century Virtuosity* ♦ **The New York New Music Ensemble** ♦ Works by Steven Mackey, Jon Magnussen, Donald Martino, and Augusta Read Thomas

### February 26

Leon Levy Lecture ♦ **Henry S. Farber**, Leon Levy Foundation Member, School of Social Science ♦ *Lessons from Taxi Drivers: The Challenge of Behavioral Decision Theory to Neoclassical Economics*

### February 27

The Sensuous in Art Lecture Series ♦ **Natalie Kampen**, Barnard College, Columbia University ♦ *Family Tragedy on the Walls of Pompeii*

### February 28

Friends Forum ♦ **Avishai Margalit**, George F. Kennan Professor, School of Historical Studies ♦ *The West and the Rest*

### March 7

Faculty Lecture ♦ **Yve-Alain Bois**, Professor, School of Historical Studies ♦ *The Difficult Task of Erasing Oneself: Non-Composition in Twentieth-century Art*

### March 28

Lecture on Public Policy ♦ Director's Visitor **Lakhdar Brahimi**, former Special Advisor to the Secretary-General of the United Nations ♦ *Afghanistan and Iraq: Failed States or Failed Wars?*

### March 30 and 31

*Recent Pasts 20/21* Music Series ♦ *The Lyric Impulse* ♦ **Trio Solisti** with **Alan Kay**, clarinet ♦ Works by Robert Beaser, Paul Moravec, and Felix Mendelssohn

### April 15

*Recent Pasts 20/21* Music Series ♦ *Folk Influences and More* ♦ **Da Capo Chamber Players** ♦ Works by Chinariy Ung, Joan Tower, Kyle Gann, Reza Vali, Stefan Weisman, and Institute Artist-in-Residence Jon Magnussen

### April 17

The Sensuous in Art Lecture Series ♦ **T. J. Clark**, University of California, Berkeley ♦ *Venese's Allegories of Love*

### April 18

Friends Forum ♦ **Peter Goldreich**, Professor, School of Natural Sciences ♦ *Some Examples of Physics in Everyday Life*

### May 4

Faculty Lecture ♦ **Michael Walzer**, UPS Foundation Professor, School of Social Science ♦ *Terrorism and Just War*

### May 11

Friends Culture and Cuisine Talk ♦ **T. Sarah Peterson**, author, *Acquired Taste: The French Origins of Modern Cooking* ♦ *The Birth of French Cooking*

### May 13

The Princeton Symphony Orchestra's Sunday Afternoon Chamber Series ♦ **Elysian Camerata** ♦ **Barbara Jaffe**, violin; **Louise Jaffe**, viola; **Talia Schiff**, cello; **Rahel Inniger**, piano

### June 8

Staff Picnic





DINAH KAZAKOFF



DINAH KAZAKOFF



CLIFF MOORE







# The School of Historical Studies

## Faculty

**Yve-Alain Bois**

**Caroline Walker Bynum**

**Patricia Crone**, Andrew W. Mellon Professor

**Nicola Di Cosmo**, Luce Foundation Professor in East Asian Studies

**Jonathan Israel**

**Avishai Margalit**, George F. Kennan Professor

**Heinrich von Staden**

## Professors Emeriti

**Glen Bowersock**

**Giles Constable**

**Oleg Grabar**

**Christian Habicht**

**Irving Lavin**

**Peter Paret**

**Morton White**

**T**he School of Historical Studies is concerned principally with the history of Western European, Near Eastern, and East Asian civilizations. Both inside and outside these broad areas of study, Faculty and Members have pursued a wide range of topics. The emphasis has traditionally been on Greek and Roman civilization, medieval, early modern and modern European history, history of art, and the history of science; but over time the School's interests have been enlarged to include Islamic culture, the history of China and Japan, modern international relations, and more recently, music studies. Over 2,000 scholars have come to the School since its foundation, and their work here in these and other areas of research has regularly been enriched by the fruitful interaction of disciplines in a small and collegial community.

The School's broad interpretation of the meaning of "Historical Studies" continues to be reflected in the research projects pursued by the fifty-four Members and three Visitors who joined the School for the academic year 2006–07. Their research spanned a diverse range of historical subjects, including the history of art, philosophy, music, religion, international relations, literature, science, and mathematics, as well as ancient history and the classics. The periods studied ranged from the Ptolemaic Empire (as far back as 300 BC) to the late twentieth century. Research carried out in the School also extended over a wide geographic range: from Europe, Egypt, the Byzantine Empire, the Middle East, Central Asia, the Indian subcontinent, China, and Japan to the Americas. The group of scholars who joined the School in 2006–07 was itself internationally diverse, including citizens of Canada, Germany, India, Israel, Japan, Lebanon, Romania, Russia, Switzerland, Turkey, the United Kingdom, and the United States. Members received support both from the Institute's own funds and from a variety of external sources, including the National Endowment for the Humanities, The Andrew W. Mellon Foundation, the Fritz Thyssen Foundation, the Gerda Henkel Foundation, and The Gladys Krieble Delmas Foundation.

Professor Yve-Alain Bois co-organized with Professor Hal Foster, chair of the Department of Art and Archeology at Princeton University, a series of lectures, *The Sensuous in Art*, which focused on a return to the object in art history after, and benefiting from, two decades of intense theorization.



DINAH KAZAKOFF

Beyond the individual research projects pursued, many events drew groups of scholars together for lectures and discussions, which facilitated the exchange of ideas across fields and regions. These included a regular series of presentations by individual Members to the School as a whole at the Monday Lunchtime Colloquia, as well as invited lectures, seminars, and a number of smaller groups that met on a regular basis to present and discuss topics of mutual interest. (See the list of events at the end of this section.)

## ACADEMIC ACTIVITIES

In 2006–07, Professor **Yve-Alain Bois** published an essay on the Venezuelan artist Gego in the retrospective catalogue of her work in Porto and Barcelona; an essay on Robert Rauschenberg in an exhibition catalogue at the De Menil Collection (Houston); an essay in the Yves Klein retrospective catalogue at the Centre Pompidou (Paris); and an essay in the Gabriel Orozco retrospective catalogue at the Museo del Palacio de Bellas Artes in Mexico City. He continued to work on the catalogue raisonné of Ellsworth Kelly's paintings and sculptures as well as on that of the Barnes Foundation's holdings of Matisse. He edited a volume of Mel Bochner's writings (forthcoming) and is currently preparing a volume of his own essays on postwar art. At the Institute, he coorganized with Professor Hal Foster, chair of the Department of Art and Archeology at Princeton University, a series of lectures, *The Sensuous in Art*, and gave one of the two Institute Faculty lectures (in the spring), as well as hosted an informal "art history lunch seminar," in which Institute Members and outside scholars presented their work.

In October, he gave the keynote to the symposium on Mel Bochner at the Chicago Art Institute and at the Annual Congress of Brazilian Art History in São Paulo. In November, he lectured on noncomposition at the Whitechapel Gallery, London, and participated in a roundtable on Gabriel Orozco in Mexico City. In December, he participated in a symposium at the Wolfsonian-Florida International University (Miami), devoted to the role of university art museums. In February, he participated in a symposium on "little magazines" organized by the Princeton University School of Architecture, and gave the SOM Lecture at the Buell Center for the Study of American Architecture at Columbia University. In March, he gave the keynote to a symposium on Matisse sculpture at the Dallas Museum of Art and participated in the symposium on Picasso between the wars at the University of California, Berkeley. In April, he lectured on noncomposition at the Johns Hopkins University (Baltimore) and participated in a symposium celebrating the thirtieth anniversary of the publication of "Sculpture in the Expanded Field" by Rosalind Krauss, held at Princeton University. In May, he gave a lecture on pseudomorphism at Tate Britain and participated in a symposium on Helio Oiticica at Tate Modern.

Professor **Caroline Bynum**'s book, *Wonderful Blood: Theology and Practice in Late Medieval Northern Germany and Beyond*, was published by the University of Pennsylvania Press in January 2007. She spent much of the academic year preparing the Harvard-Hebrew University lectures, which were given in Jerusalem May 7–9, under the title "Christian Materiality."

The three lectures explored the importance of material objects in medieval Christianity with two goals: first, to argue that the fifteenth century saw the proliferation of holy objects (images, relics, etc.), which presented so deep a challenge to ecclesiastical authorities and ordinary Christians as to be a major factor leading to the Protestant Reformation; second, to use the nature of such holy matter to underline the differences between Christianity, Judaism, and Islam. The first lecture, “Visual Matter,” dealt with the way in which medieval images interrogate their own materiality; the second, “Holy Pieces,” explored the increasing tendency for holy objects to be divided yet understood, paradoxically, as whole; and the third, “Matter and Miracles,” treated the theories natural philosophers and theologians developed to explain the eruption of the sacred in matter.

Professor Bynum also published a long review article on the *New Cambridge Medieval History* and several other reviews. She wrote a preface for the English translation of the exhibition catalogue, *Krone und Schleier*. In the fall, she gave a talk on the Kaufmann Crucifixion at Columbia University, led two seminars on medieval anti-Semitism at the University of Maryland, commented on Jeffrey Hamburger’s lecture for The Sensuous in Art lecture series, and lectured on German piety in the Distinguished Lecture Series at New York University. In the spring, she presented the Reckford Lecture at the University of North Carolina on her new book and gave the keynote address, “Visual Matter,” at the Medieval Association of the Pacific in Los Angeles, testing out some ideas for her first Jerusalem lecture. She continued to work with Columbia University Ph.D. students and led a workshop in Jerusalem for graduate students from five Israeli universities. She received a doctorate of humane letters *honoris causa* from the University of Pennsylvania.

At the Institute, she led a weekly lunchtime discussion group in medieval studies that was attended by Members in European, Middle Eastern, and Asian history, as well as by several scholars from neighboring universities. With Professor Joan Scott in the School of Social Science, she convened a group on gender studies that met for lively exchanges on occasional Fridays.

Andrew W. Mellon Professor **Patricia Crone** finished a long article on the interpretation of the Quranic statement, “There is No Compulsion in Religion,” from the earliest times until 2006 and drafted a short version for use as a lecture, which she delivered at Rice University, Miami University, and the University of Chicago. She also drafted a paper on the grounds on which the Quranic “polytheists” reject Muhammad’s claim to prophetic status (part of a long-term project to establish the religious identity of the people in question) for a workshop in the Department of Religion at Princeton, spent a couple of months rethinking and rewriting a paper on an enigmatic Quranic accusation against the Jews, which she had drafted some years ago and then discarded, and chaired more conference sessions in diverse places than she can remember. Three of her articles appeared in

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*Wonderful Blood: Theology and Practice in Late Medieval Northern Germany and Beyond* (University of Pennsylvania Press, 2007) by Professor Caroline Bynum (left), explored how and why Christ’s blood as both object and symbol was central to late medieval art, literature, and religious life. Professor Patricia Crone (right) brought together classicists and Islamicists for a discussion of how one might go about connecting the Dahrīs (loosely “materialists”) of early Islamic Iraq with the thought worlds of late antiquity.



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print, one on the attitudes of non-Arab Muslims toward the Arabs who had defeated their ancestors, another on a ninth-century theologian's trouble with the idea that infidels will suffer eternal punishment, and a third on the Qurashi leather trade (a considerably more interesting topic than it sounds). She also published some popular pieces on the Web. And, thanks to friends in diverse places, she finally obtained a copy of the Arabic translation of her *Meccan Trade and the Rise of Islam*, of which she had begun to doubt the existence. It is now the reality of the Turkish translation of *Medieval Islamic Political Thought* (called *God's Rule in America*) that she is beginning to doubt, but translations into Arabic and Persian are definitely underway.

The Islamicist seminar at the Institute convened a number of times, but was completely overshadowed by the Quran reading group, which was exceptionally large and lively this year. Professor Crone's research assistant, Dr. Masoud Jafarijaze, also led a small group reading Persian texts, and the year ended on a high note with a workshop in May consisting of nine seminars on the so-called Dahrīs (loosely "materialists") of early Islamic Iraq. These seminars, conceived in discussion between Professor Crone, Professor Heinrich von Staden, and Member Emma Gannagé (Université Saint-Joseph, Beirut, then the Institute), brought together classicists and Islamicists, some resident, others invited, for a discussion of how one might go about connecting the Dahrīs with the thought world of late antiquity.

Luce Foundation Professor **Nicola Di Cosmo** organized a series of seminar talks (sixteen) with a group of East Asian scholars from the Schools of Historical Studies and Social Science, which included Members as well as invited speakers. Topics covered a wide range from history to anthropology and from science to art history. In March, he convened an international workshop on "The Sense of the Past among Inner Asian Peoples," funded by the Gerda Henkel Foundation. Participants included Japanese, Korean, Kazakh, French, and American scholars, and Members of the School of Historical Studies. The workshop explored how Inner Asian peoples, especially ancient Turks, Mongols, and Manchus, have traditionally related to their past, through legends, oral transmission, genealogies, and religious and dynastic histories.

Professor Nicola Di Cosmo (left) organized an international workshop that explored how Inner Asian people, especially ancient Turks, Mongols, and Manchus, have traditionally related to their past, through legends, oral transmission, genealogies, and religious and dynastic histories.



The construction of ethnographies and histories of alien peoples in ancient Chinese history has been one of the main research themes of the year, based on a comparative frame of reference that includes Greek, Roman, and late antique historiography. He edited a volume, *Military Culture in Imperial China*, and submitted it for review to Harvard University Press. The book was accepted and is expected to be published next year. Another area of editorial activity concerns his continuing work as coeditor of the *Cambridge History of Medieval Inner Asia*. Three book chapters, an article, a review article, and a book review were published in



2006–07 (see list of publications at [www.hs.ias.edu/eas/di\\_cosmoweb-page.htm](http://www.hs.ias.edu/eas/di_cosmoweb-page.htm)).

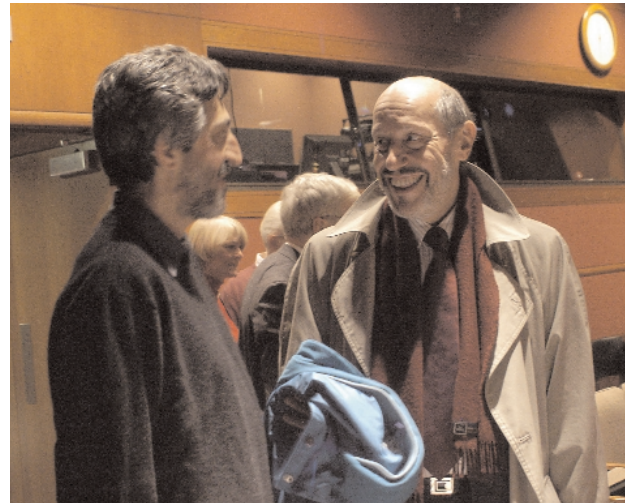
His professional activities included service on the Board of Directors and as Chair of the China and Inner Asian Council of the Association of Asian Studies. He also served on the editorial boards of the *Journal of Asian Studies* and *Asia Major*, as series editor for Brill Academic Publishers, and as referee for, among others, the American Council of Learned Societies and the Radcliffe Institute.

He lectured at American and European universities, including Freiburg, Pennsylvania, Turin, Piemonte Orientale, Rowan, and Granada. In November, he gave the keynote speech at the annual meeting of the Mongolian-American Cultural Association in New Brunswick, New Jersey. While his presentation was overshadowed by a stunning dance and invocation performance by a Mongol shaman, the occasion presented an excellent opportunity to liaise with the local Asian community. In April, he spoke at a meeting of Italian scholars in the humanities and social sciences teaching in North America that was held in Washington, D.C. (Italian Embassy and Georgetown University). In May, he presented a series of four lectures on “Traditional Chinese Historiography” at the Istituto di Studi Umanistici in Florence, Italy.

During the academic year 2006–07, Professor **Jonathan Israel** chiefly concentrated on drafting chapters for the third part of his long-term project on the Western Enlightenment, continuing to base his reinterpretation on the centrality, as he sees it, of the clash between “moderate” Enlightenment and radical ideas. The second volume of his multivolume history was published in the fall of 2006 by Oxford University Press, *Enlightenment Contested: Philosophy, Modernity and the Emancipation of Man, 1670–1752*.

Since the main thrust of the Radical Enlightenment during the period 1750 to 1790, covered by the third volume, though often composed in French, was published in the form of then clandestine and illegal works printed in Holland and the originals are often rather rare—and as many chapters in the new volume deal with themes, such as the Dutch democratic movement (*Patriottenbeweging*) of the 1780s and the rising criticism of colonial exploitation in Asia as practiced by the Dutch East India Company, where Dutch or Dutch-produced sources are fundamental—it was particularly convenient within the framework of Professor Israel’s long-term project that he was able to spend three months (April–June 2007) researching in Holland. During these months, Professor Israel held the KB Fellowship at the Royal Library in The Hague, based jointly there and at the Netherlands Institute for Advanced Study (NIAS). He is the fourth to hold this fellowship in succession to Peter Burke, Emmanuel le Roy Ladurie, and Robert Darnton.

The public lecture given in association with the fellowship, delivered at the Royal Library on June 21, has been published under the title, “‘Failed Enlightenment’: Spinoza’s Legacy and the Netherlands (1670–1800)” (NIAS, 2007). During this academic session, Professor Israel



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In *Enlightenment Contested: Philosophy, Modernity and the Emancipation of Man, 1670–1752* (Oxford University Press, 2006) Professor Jonathan Israel (right; pictured with School of Mathematics Professor Avi Wigderson) continued his major revisionist study on the Western Enlightenment.

*During the academic year 2006–07, Professor Jonathan Israel chiefly concentrated on drafting chapters for the third part of his long-term project on the Western Enlightenment, continuing to base his reinterpretation on the centrality, as he sees it, of the clash between “moderate” Enlightenment and radical ideas.*

has also delivered lectures on Spinoza, Bayle, and on the Enlightenment, at Pittsburgh, Montreal, Amsterdam, Nijmegen, Deventer, Rotterdam, New Brunswick, NJ, and New York City, NY. His other publications during this year were his introduction to and edited translation (together with Michael Silverthorne) of Spinoza’s *Theological-Political Treatise* (Cambridge University Press, 2007); his 2006 Sir Thomas More Lecture with an interview, translated into Dutch under the title *Gedachtevrijheid versus godsdienstvrijheid. Een dilemma van de Verlichting* (Nijmegen, 2007); and “Spinoza as an Expounder, Critic, and ‘Reformer’ of Descartes,” *Intellectual History Review* XVII (2007), pp. 41–53. Also published were his chapter, “Unité et diversité des Lumières radicales: typologie de ses intellectuels et de ses racines culturelles,” in *Qu’est ce que les Lumières “Radicales”? Libertinage, Athéisme et spinozisme dans le tournant philosophique de l’âge classique*, edited by Catherine Secrétan, Triстан Dagron, and Laruent Bove (Paris: Éditions Amsterdam, 2007), pp. 37–59; “Group Identity and Opinion among the Huguenot Diaspora and the Challenge of Pierre Bayle’s Toleration Theory (1685–1706)” in *Public Opinion and Changing Identities in the Early Modern Netherlands: Essays in Honour of Alastair Duke*, edited by Judith Pollmann and Alastair Spicer (Leiden–Boston, 2007), pp. 279–93; and “La Politique” in *La Belgique espagnole*, edited by Paul Janssens (Luxemburg, 2006), sections 1.1.1 to 1.1.5, pp. 25–46.

This was George F Kennan Professor **Avishai Margalit**’s first year at the Institute. He discovered that Peter Goddard was right; the Institute does not offer any alibi not to work.

His main project during the year was writing a book, *Compromises and Rotten Compromises*, dealing with political compromises, especially in international relations. The kernel of the book is his Tanner Lectures of 2005, greatly expanded. He completed a draft and is now working on polishing it. The book will be published by Princeton University Press in 2008. Other writing assignments he completed during the year included: a long essay on Wittgenstein’s influence in twentieth-century analytic philosophy (to appear in a festschrift published by Blackwell); an essay on Spinoza and Leibniz appeared in the *New York Review of Books* on April 12, 2007; and a commentary on this year’s Tanner Lectures (given by Professor Joshua Cohen of Stanford University), on the topic of global public reason, will be published by Oxford University Press.

In addition to writing, he lectured in many venues, including talks at the Center for Human Values at Princeton University on “Indecent Compromises”; a University of Toronto conference on “Peace and Rationality in the Middle East”; at Stanford University on “Compromises”; to the Friends of the Institute on “The West and the Rest”; and to Institute staff on “Compromises and Rotten Compromises.”

He had many working lunches with Members of the Institute, trying to assist with their work; letters he received at the end of their stays make him believe that he was of some help.

In the academic year 2006–07, Professor **Heinrich von Staden**’s external lectures included the following. In December 2006, he gave the Frederic L. Holmes Lecture at Yale University on “Sexual Activity, Health, and Disease in Ancient Greece.” With two former Members of the Institute,

Jacques Jouanna and Philip van der Eijk, he presented a symposium on “Hippocrates and Hippocratic Medicine: The Current State of Research” at Columbia University’s Center for the Ancient Mediterranean, also in early December. On this occasion, Professor von Staden contributed a paper on “The Hellenistic Hippocrates.” In April, he gave a lecture at the University of Zurich (Hellas Gesellschaft) on the cultural implications of prescriptions of sexual abstinence and sexual intercourse in ancient medical texts. In May, he gave a talk at Princeton University at the invitation of the national Association of Ancient Historians (at their annual meeting) on “The Physician as Historian,” in which he explored features of historiography embedded in ancient technical literature. In June, he gave the annual Paterson Lecture at the annual meeting of the Canadian Society for the History of Medicine, in conjunction with the Canadian Congress of the Humanities and Social Sciences; his topic was “The Physiology of Morals.” He also participated in a colloquium at the Berlin-Brandenburgische Akademie der Wissenschaften that celebrated the hundredth anniversary of the founding of the *Corpus Medicorum Graecorum/Latinorum* (“Antike Medizin im Schnittpunkt von Geistes- und Naturwissenschaften”), and in the annual meeting of the “Arbeitskreis Alte Medizin” at the University of Mainz in early June.

Aside from a number of book reviews, he completed several articles, including “Interpreting ‘Hippokrates’ in the 3rd and 2nd centuries BC,” in *Ärzte und ihre Interpreten. Medizinische Fachtexte der Antike als Forschungsgegenstand der Klassischen Philologie*, edited by C.W. Müller, C. Brockmann, and C.W. Brunschön (Munich/Leipzig, 2006), pp. 15–47, as well as articles on the Hippocratic oath, catharsis, and the sublime. Professor von Staden also continued to serve on the editorial boards of several journals in the United States and in Europe.

The first year of retirement for Professor Emeritus **Glen Bowersock** was a busy one. He made four trips to Paris: two in connection with his responsibilities at the Fonds Louis Robert of the Académie des Inscriptions et Belles-Lettres; one for a video interview on the *Book of Revelation* for a forthcoming French television series; and one to speak in honor of former Institute Member Jean-Louis Ferrary. Professor Bowersock also began a second five-year term as adviser to the Academy of Finland on several important projects involving Petra and Alexandria. He was in Finland for consultations in early November and participated in a colloquium on late antiquity. In December and May, Professor Bowersock chaired meetings of the Consiglio Scientifico of the Istituto di Studi Umanistici in Florence. In May, he also delivered a series of four lectures (“From Rome to Kandahar: Four Perspectives on Graeco-Roman Antiquity”) at the Palazzo Strozzi in Florence at the invitation of the Istituto Italiano di Scienze Umane.

On February 1, Professor Bowersock delivered the annual Runciman Lecture at King’s College London in memory of the late Sir Steven Runciman. In March, he spent a week at the American Academy in Berlin as a Distinguished Visitor and delivered a lecture on “The Roman Empire and the Clash of Civilizations.” He spoke twice at Columbia University in the spring, once to the classics department (“A Terrorist Charity in Late Antiquity”) and once to a symposium on Aelius Aristides (“Aristides and

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the Pantomimes”). In April, he lectured at Indiana University as a guest of the new ancient studies program. In early May, he delivered the inaugural address at an international conference on the ancient Greek traveler Pausanias in Athens.

In addition to articles and reviews, Professor Bowersock published three books in the past academic year. The first was *Mosaics as History: From Late Antiquity to Islam*; the second, a translation of Lorenzo Valla’s oration *On the Donation of Constantine* (with introduction and notes); and the third, *Saggi sulla tradizione classica dal Settecento al Novecento*, containing sixteen studies of modern historians, critics, and poets. In the autumn of 2006, Professor Bowersock served on the search committee to select a director for the newly created Institute for the Study of the Ancient World at New York University.

During the academic year 2006–07, Professor Emeritus **Giles Constable** published four articles, three book reviews, two memoirs, and a preface. An Italian translation of his book, written with William Connell, was published under the title *Sacrilegio e Redenzione nella Firenze rinascimentale*. A meeting to celebrate the publication, at which Professor Constable spoke, was held in Florence. He also spoke at meetings at the University of Sheffield, the University of Mississippi, the Metropolitan Museum of Art, Dorothea’s House (Princeton), the University of Nice, and the Institute of Historical Research (London). He presided at sessions of meetings in Cambridge (England), Princeton (a meeting on “Romanesque Art and Thought in the Twelfth Century”), and attended other scholarly meetings in Princeton. He presided at an *habilitation* at the Sorbonne. As in previous years, he served on the advisory board of the Delmas Foundation and on the editorial boards of several scholarly journals.

Professor Emeritus Oleg Grabar (seated left) published a new book on the Dome of the Rock (Harvard University Press, 2006) and gave the keynote address to the International Congress of Early Islamic Archaeology held in Damascus.

Professor Emeritus **Oleg Grabar**’s new book on the Dome of the Rock was published by Harvard University Press. He lectured at the American University of Beirut; the Université St. Joseph, also in Beirut; the American Society for the Study of Texts; Bogazici University in Istanbul; the Art Institute in Chicago; and Northwestern University in Evanston, Illinois. He also gave the keynote address to the International Congress of Early Islamic Archaeology held in Damascus.

Professor Emeritus **Christian Habicht** continued to work on the history of the city of Cyzicus (sea of Marmara) in antiquity and resumed work on the epigraphy and history of the island of Cos and of Thessaly. He submitted a lengthy paper “Neues zur hellenistischen Geschichte von Kos” to *Chiron* and had another paper “A Decree for Koan Judges” accept-



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ed for publication in *Hyperboreus*, in which he identified Cyzicus as the city that issued this decree. Concerning Thessaly, he wrote a paper “Zum Problem thessalischer Phratrien” and had another, “Judicial Control of the Legislature in Greek States,” accepted for publication in *Studi Ellenistici* (Pisa), vol. 20. He studied from a photograph a new decree of the city of Mylasa in Caria honoring the well-known third-century dynast Olympichus; he transcribed it and drafted comments while waiting for its publication by a Danish scholar. In October, he participated in an international symposium, “The Romans in Asia,” at Yale University.

Professor Habicht’s contribution, “My Work in Thessaly,” was included in the volume, *Inscriptions and History of Thessaly. New Evidence* (Proceedings of an International Symposium in honor of Professor Christian Habicht), which was published jointly by the University of Thessaly, the Archaeological Institute for Thessalian Studies, and the Greek Epigraphical Society (Volos, 2006).

His other publications were: “Versäumter Götterdienst,” *Historia* 55 (2006), pp. 153–66; “Marcus Agrippa, Theos Soter,” *Hyperboreus* 11 (2005), pp. 242–46; “Eurykleides III of Kephisia, victor at the Anakaia,” *Zeitschrift für Papyrologie und Epigraphik* 158 (2006), 159–63.

In June, Professor Emeritus **Irving Lavin** gave his annual seminar at the Istituto Italiano per gli Studi Filosofici, in Naples, Italy. His subject was “Caravaggio: il modo delle Faccie.” He lectured in the plenary session of the colloquium called “The Grand Re-Tour,” sponsored by the Fondazione per il Libro, la Musica, e la Cultura, and held in the south Italian city of Lecce. He also lectured at the Istituto Italiano di Scienze Umane in Florence for the Doctorate course in Studi in Antichità, Medioevo, Rinascimento. He was plenary speaker at the colloquium held at the University of Rome (La Sapienza) in honor of Professor Adolfo Venturi (d. 1941). Professor Lavin was appointed to il Comitato Nazionale per il V Centenario della Fondazione della Basilica di San Pietro. His publications during this period include: *Picassos Stiere oder die Kunstgeschichte von hinten*, Second, enlarged edition (Berlin), 2007; *Bernini a San Pietro: singularis in singulis, in omnibus unicus* (Rome), 2007; “Il Volto Santo di Claude Mellan: ostendatque etiam quae occultet,” in *L’immagine di Cristo. Dall’acheropita alla mano d’artista. Dal tardo medioevo all’età barocca*, Studi e testi 432, edited by Christoph L. Frommel and Gerhard Wolf (Vatican City), 2006, pp. 449–91 (French translation in *Mélanges Fumaroli*, in course of publication); “Michelangelo, Mosè e il ‘papa guerriero,’” in *Il ritratto nell’Europa del Cinquecento. Arte, Letteratura, Società, Convegno Internazionale di Studi*, edited by Aldo Galli, et al. (Florence, Istituto Nazionale di Studi sul Rinascimento, 7–9 novembre 2002) (Florence), 2007, 199–215; “We must leave the city to our children exactly as we found it,” in *Festschrift Horst Bredekamp* (Berlin), 2007, pp. 491–98; “Modern Art and Kirk Varnedoe’s Books,” in *The Institute Letter*, Winter 2007, p. 9.



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Professor Emeritus Christian Habicht (pictured with his wife Freia) continued to work on the history of the city of Cyzicus (sea of Marmara) in antiquity and resumed work on the epigraphy and history of the island of Cos and of Thessaly.



*His new work will be a critical study of the ideas of necessary truth, indubitability, and certainty in the writings of philosophers from Descartes to the present day, a study in which Professor White tries to show how highly technical rationalistic views in logic, epistemology, and metaphysics were used to defend controversial views in the wider philosophy of culture, for example, in Descartes's attempt to prove the existence of God, in Hobbes's political philosophy, in Kant's ethical theory, and in Hegel's philosophy of history.*

During the 2006–07 academic year, Professor Emeritus **Peter Paret** wrote a new introduction for the third revised edition of his monograph *Clausewitz and the State*, which Princeton University Press published in the spring of 2007. He wrote reviews for *The American Historical Review* and for *The Journal of Military History*. In its series, *Oxford World Classics*, Oxford University Press published a condensed version of the English edition of Carl von Clausewitz's *On War*, which he and Michael Howard translated and edited. Cambridge University Press reprinted his monograph *An Artist against the Third Reich: Ernst Barlach, 1933–1938*, which also appeared in a German translation, *Ein Künstler im Dritten Reich—Ernst Barlach, 1933–1938* (Berlin: wjs Verlag), 2007. The Humboldt Universität, Berlin, awarded him an honorary doctorate.

Professor Paret has begun work on two longer-term projects. In the fall of 2008 he will give the Lees Knowles Lectures in Military History at Trinity College, Cambridge University. With Professor Esther da Costa Meyer of Princeton University and Helga Thieme of the German Ernst Barlach Stiftung, he is preparing an exhibition of Ernst Barlach's drawings on the medieval epic, the *Nibelungenlied*, a poem that since its rediscovery in the eighteenth century has occupied an iconic place in German art, literature, and music. From the Wilhelmine empire to the end of the Second World War, it was a frequently evoked symbol in German political history. The exhibition will be seen in Germany and from January to March 2009 at the Art Museum of Princeton University.

Professor Emeritus **Morton White's** book, *The Intellectual Versus the City: From Thomas Jefferson to Frank Lloyd Wright* (1962), written with the late Lucia Perry White, is scheduled to be reissued with a new introduction.

Professor White continues to work on a “prequel” to his book *A Philosophy of Culture* (2002). His new work will be a critical study of the ideas of necessary truth, indubitability, and certainty in the writings of philosophers from Descartes to the present day, a study in which White tries to show how highly technical rationalistic views in logic, epistemology, and metaphysics were used to defend controversial views in the wider philosophy of culture; for example, in Descartes's attempt to prove the existence of God, in Hobbes's political philosophy, in Kant's ethical theory, and in Hegel's philosophy of history.

This examination will continue with a study of similar efforts by philosophers and thinkers of the nineteenth and twentieth centuries, thereby providing a background for the views set forth in White's *A Philosophy of Culture*.

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*History of Mathematics* ♦ National Tsing Hua University, Taiwan ♦ *s*  
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**Shira Wolosky**

*American Studies* ♦ Hebrew University of Jerusalem ♦ *s*  
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**Aron Zysow**

*Islamic Studies* ♦ Harvard Law School ♦ *s*  
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*f* First Term ♦ *s* Second Term ♦ *v* Visitor ♦  
*a* Research Assistant

**RECORD OF EVENTS****October 1**

East Asian Studies Seminar ♦ *Nomad Tribes vs. Sedentary States: Breaking Down the Dichotomy* ♦  
**Christopher Atwood**, Indiana University;  
Member, School of Historical Studies

**October 2**

Historical Studies Lunchtime Colloquium:  
Introductions

**October 4**

Medieval Table Lunchtime Colloquium ♦  
*Paradigms, Methods and Periodization: Reconsidering the Early Middle Ages in Twenty-first Century America* ♦ **Celia Chazelle**, The College of New Jersey and **Felice Lifshitz**, Florida International University; Member, School of Historical Studies

**October 9**

Historical Studies Lunchtime Colloquium ♦  
*China at War, 1937–1945: Remembering and Re-remembering China's War of Resistance against Japan* ♦ **Parks Coble**, University of Nebraska; Member, School of Historical Studies

East Asian Studies Seminar ♦ *Reactionary Modernists: Schisms and Asian Modernities in Urad West Duke Banner, Inner Mongolia* ♦  
**Caroline Humphrey**, Cambridge University

**October 10**

Islamicist Seminar ♦ *The Identity of Shahralanyozan* ♦ **Jairus Banaji**, Jawaharlal Nehru University; Member, School of Historical Studies

**October 11**

Medieval Table Lunchtime Colloquium ♦  
*Interdisciplinarity: History, Religious Studies, Medieval Studies* ♦ **Martha Newman**, University of Texas at Austin; Member, School of Historical Studies

**October 16**

Historical Studies Lunchtime Colloquium ♦  
*Platonism as Tradition. A Problem of Definition* ♦  
**Stephen Gersh**, University of Notre Dame; Member, School of Historical Studies

**October 18**

Medieval Table Lunchtime Colloquium ♦  
*Platonism as Tradition. A Problem of Definition* ♦  
**Stephen Gersh**, University of Notre Dame; Member, School of Historical Studies

Classics Seminar ♦ *Aristotelianism, Galenism and Platonizing Christianity in Nemesius of Emesa's On the Nature of Man* ♦ **Philip van der Eijk**, University of Newcastle upon Tyne; Member, School of Historical Studies

**October 23**

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**Kathryn Lowry**, Independent Scholar; Member, School of Historical Studies

**October 24**

Early Modern and Nineteenth-century Historians Workshop ♦ *Vive Les Gueux! Iconoclasm, Inversion, and the Problem of Authority* ♦  
**Peter Arnade**, California State University, San Marco; Member, School of Historical Studies

**October 30**

Historical Studies Lunchtime Colloquium ♦  
*Menelik in America: A Panofsky Moment in the History of Race* ♦ **Raymond Jonas**, University of Washington; Member, School of Historical Studies

**October 31**

East Asian Studies Seminar ♦ *The Tibet Site Seminar: Prospects for Buddhist Studies, Art History, and Tibet* ♦ **Stephen Teiser**, Princeton University and **Wei Yang**, Independent Scholar

School Lecture ♦ *Pictures & Politics and the Court of Philip IV of Spain: Re-thinking the Hall of Realms* ♦ **Richard Kagan**, Johns Hopkins University; Member, School of Historical Studies

**November 1**

Medieval Table Lunchtime Colloquium ♦ *The Devil's Trial* ♦ **Karl Shoemaker**, University of Wisconsin, Madison; Member, School of Historical Studies

**November 6**

Historical Studies Lunchtime Colloquium ♦ *Medicine of the Soul, Philosophy of the Body. Aristotle, Aristotelianism, and Medical History* ♦ **Philip van der Eijk**, University of Newcastle upon Tyne; Member, School of Historical Studies

**November 7**

East Asian Studies Seminar ♦ *Remembering and Re-remembering China's War against Japan, 1937–1945: The Legacy of Wartime Reporting* ♦ **Parks Coble**, University of Nebraska; Member, School of Historical Studies

**November 8**

Medieval Table Lunchtime Colloquium ♦ *Maternal Sacrifice and the Eucharist: A Late Twelfth-century Cistercian Vision* ♦ **Martha Newman**, University of Texas at Austin; Member, School of Historical Studies

History of Science Seminar ♦ *From Vitalistic Cosmos to Materialistic Earth: Reconsidering the Chemical Lineage of Johann Joachim Becher (1635–1682) and Georg Ernst Stahl (1659–1734)* ♦ **Ku-Ming (Kevin) Chang**, Academia Sinica; Member, School of Historical Studies

**November 9**

Islamicist Seminar ♦ *Urban Gangs in Pre-colonial Fez: Futuwwa or Mafia?* ♦ **Mohamed El Mansour**, Mohammed V University, Morocco; Member, School of Historical Studies

Art History Seminar: Informal Discussion

**November 13**

Historical Studies Lunchtime Colloquium ♦ *"Better than millions of words." Diagrams in Chinese Commentaries* ♦ **Michael Lackner**, University of Erlangen-Nuremberg; Member, School of Historical Studies

**November 14**

Art History Seminar ♦ *Pseudomorphism* ♦ **Yve-Alain Bois**, Professor, School of Historical Studies

**November 15**

Early Modern and Nineteenth-century Historians Workshop ♦ *Patent Democracy: Specifying Inventions, Constructing Rights and Geniuses* ♦ **Mario Biagioli**, Harvard University; Member, School of Historical Studies

Medieval Table Lunchtime Colloquium ♦ *Writing an Introduction to Hugh of St. Victor* ♦ **Paul Rorem**, Princeton Theological Seminary; Visitor, School of Historical Studies

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**November 17**

Classics Seminar ♦ *Symmachus and His Friends Quaestores at the Court of the Emperor* ♦ **Rita Lizzi**, University of Perugia; Member, School of Historical Studies

**November 20**

Historical Studies Lunchtime Colloquium ♦ *History and Empire in Early Modern Spain* ♦ **Richard Kagan**, John Hopkins University; Member, School of Historical Studies

**November 21**

Art History Seminar: Informal Discussion

**November 27**

Historical Studies Lunchtime Colloquium ♦ *Concerning the Spiritual—and the Concrete—in Kandinsky's Art* ♦ **Lisa Florman**, The Ohio State University; Member, School of Historical Studies

History of Science Seminar ♦ *The Witness Effect: Kepler and Galileo On the Uses and Misuses of Testimony* ♦ **Mario Biagioli**, Harvard University; Member, School of Historical Studies

**November 29**

Medieval Table Lunchtime Colloquium ♦ *An Early Medieval Image of the Crucifixion* ♦ **Felice Lifshitz**, Florida International University; Member, School of Historical Studies

**December 4**

Historical Studies Lunchtime Colloquium ♦ *The Bishop and the Emperor: The Making of Their Relationship in Late Antiquity* ♦ **Rita Lizzi**, University of Perugia; Member, School of Historical Studies

**December 6**

East Asian Studies Seminar ♦ *"The Marrano Emperor": The Mysterious, Intimate Bond between Zhu Yuanzhang and His Muslims* ♦ **Zvi Ben-Dor Benite**, New York University

Medieval Table Lunchtime Colloquium ♦ *Writing Barbarians* ♦ **Christopher Atwood**, Indiana University; Member, School of Historical Studies

Classics Seminar ♦ *New Material from the Recently Discovered Manuscript Vlatadon 14* ♦ **Veronique Boudon-Millot**, Université de Paris-Sorbonne/Paris-IV

**December 7**

Art History Seminar ♦ *The Nazareans* ♦ **Cordula Grewe**, Columbia University; Member, School of Historical Studies

**December 11**

Historical Studies Lunchtime Colloquium ♦ *Spanish Furies and the City Triumphant in the Dutch Revolt* ♦ **Peter Arnade**, California State University, San Marcos; Member, School of Historical Studies

**December 13**

Early Modern and Nineteenth-Century Historians Workshop ♦ *The Role of the Dissertation in the Communication of Knowledge in Early Modern Europe* ♦ **Ku-Ming (Kevin) Chang**, Academia Sinica; Member, School of Historical Studies

Classics and Islamicist Joint Seminar ♦ *Medicine, Logic and the Theory of the Elements: The Case of Ya'qub ibn Ishaq al-Isra'ili al-Mahali, A Medieval Physician of the Late Twelfth–Early Thirteenth Century in Egypt* ♦ **Emma Gannagé**, Université Saint-Joseph, Beirut; Member, School of Historical Studies

**December 18**

Historical Studies Lunchtime Colloquium ♦ *Historicizing the Boundary between Science and Religion* ♦ **Matthew Stanley**, Iowa State University; Member, School of Historical Studies

**December 19**

East Asian Studies and Art History Joint Seminar ♦ *Picturing Where You Are in Illustrated Letter Collections of Seventeenth-century China* ♦ **Kathryn Lowry**, Independent Scholar; Member, School of Historical Studies

**December 20**

Medieval Table Lunchtime Colloquium ♦ *Encompassing Exchange in Early Fifteenth-century Painting: East-West, North-South* ♦ **Diane Ahl**, Lafayette College; Member, School of Historical Studies



Art History Seminar ♦ *Picasso's 1925 The Dance* ♦ **Lisa Florman**, The Ohio State University; Member, School of Historical Studies

#### January 15

Historical Studies Lunchtime Colloquium: Introductions

#### January 16

Art History Seminar: Informal Discussion

#### January 22

Historical Studies Lunchtime Colloquium ♦ *Viennese Musical Modernism: Beyond the Tonal/Atonal Divide* ♦ **Christopher Hailey**, Independent Scholar; Member, School of Historical Studies

#### January 23

East Asian Studies Seminar ♦ *Political Stability in Hong Kong after 1997: Hopes and Realities of the Tung Chee-hwa Administration* ♦ **Sin-Ming Shaw**, Independent Scholar

#### January 24

Early Modern and Nineteenth-century Historians Workshop ♦ *"And that is the Truth": Discipline and Disciplinary Formation* ♦ **Herman Bennett**, Rutgers, The State University of New Jersey; Member, School of Historical Studies

#### January 25

Art History Seminar: Informal Discussion

#### January 29

Historical Studies Lunchtime Colloquium ♦ *Reading the Iliad in the Twenty-first Century* ♦ **Margalit Finkelberg**, Tel Aviv University; Member, School of Historical Studies

#### January 31

Medieval Table Lunchtime Colloquium ♦ *The Stirrup Controversy Revisited* ♦ **Florin Curta**, University of Florida; Member, School of Historical Studies

#### February 5

Historical Studies Lunchtime Colloquium ♦ *Femina liberaliter instituta—A Woman of Good Upbringing: Perpetua* ♦ **Walter Ameling**, Friedrich-Schiller-Universität, Jena; Member, School of Historical Studies

#### February 6

East Asian Studies Seminar ♦ *The Butcher, the Baker, and the Carpenter: Chinese Sojourners in the Spanish Philippines and Their Impact on Southern Fujian (Sixteenth–Eighteenth Centuries)* ♦ **Lucille Chia**, University of California, Riverside; Member, School of Historical Studies

#### February 7

Medieval Table Lunchtime Colloquium ♦ *Wonderful Blood: The Making of a Book* ♦ **Caroline W. Bynum**, Professor, School of Historical Studies

#### February 12

Historical Studies Lunchtime Colloquium ♦ *Tenth-century Cave Monasticism and Fortified Frontiers* ♦ **Florin Curta**, University of Florida; Member, School of Historical Studies

#### February 13

Art History Seminar: Informal Discussion

#### February 14

Early Modern and Nineteenth-century Historians Workshop ♦ *The Reformation As a Crisis of Trust* ♦ **Geoffrey Hosking**, University College London; Member, School of Historical Studies

Medieval Table Lunchtime Colloquium ♦ *False Prophet, False Messiah, and the Religious Scene in Seventh-century Jerusalem* ♦ **Guy Stroumsa**, Hebrew University

Classics Seminar ♦ *The Function and Significance of Coinage in Hellenistic Asia Minor: Some Case Studies* ♦ **Andrew Meadows**, The British Museum; Member, School of Historical Studies

#### February 20

East Asian Studies Seminar ♦ *Chinese Minstrels: The Chang Daoqing Performers of Jinhua* ♦ **Eugene Cooper**, University of Southern California; Member, School of Social Science

#### February 21

Medieval Table Lunchtime Colloquium ♦ *Signifying through Words and Images in Thirteenth-century Paris* ♦ **Katherine Tachau**, University of Iowa; Visitor, School of Historical Studies

History of Science Seminar ♦ *The Pointsman: Maxwell's Demon and Victorian Free Will* ♦ **Matthew Stanley**, Iowa State University; Member, School of Historical Studies

#### February 22

Art History Seminar ♦ *Piranesi's Map of Rome* ♦ **Heather Hyde**, University of Illinois, Urbana-Champaign

#### February 26

Historical Studies Lunchtime Colloquium ♦ *Shulamith and Maria: Erotic Mariology and the Cult of Friendship* ♦ **Cordula Grewe**, Columbia University; Member, School of Historical Studies

East Asian Studies Seminar ♦ *Chinese Influence on Western Examination System: A Historiographical Thesis under Examination* ♦ **Ku-Ming (Kevin) Chang**, Academia Sinica; Member, School of Historical Studies

#### February 27

East Asian Studies Seminar ♦ *The Mongols' Search for "Independence" in 1911* ♦ **Tatsuo Nakami**, Tokyo University of Foreign Studies; Member, School of Historical Studies

#### February 28

Medieval Table Lunchtime Colloquium ♦ *Some Considerations in Text Editing* ♦ **Felice Lifshitz**, Florida International University; Visitor, School of Historical Studies

#### March 5

Historical Studies Lunchtime Colloquium ♦ *Civic Feminism, American Religion, and American Women's Poetry* ♦ **Shira Wolosky**, Hebrew University of Jerusalem; Member, School of Historical Studies

#### March 7

Medieval Table Lunchtime Colloquium ♦ *Visualizing Visions* ♦ **Martha Newman**, University of Texas at Austin; Member, School of Historical Studies

#### March 9

Classics Seminar ♦ *Tragic Memories of Dionysos* ♦ **Renate Schlesier**, Freie Universität Berlin; Member, School of Historical Studies

#### March 12

Historical Studies Lunchtime Colloquium ♦ *Just a Taste of Kant* ♦ **Andrew Chignell**, Cornell University; Member, School of Historical Studies

#### March 13

East Asian Studies and Art History Joint Seminar ♦ *Yuan Dynasty Tombs and Their Inscriptions* ♦ **Nancy Steinhardt**, University of Pennsylvania; Member, School of Historical Studies

#### March 14

Medieval Table Lunchtime Colloquium ♦ *Diagrams in the Imagination and in Texts* ♦ **Paul Rorem**, Princeton Theological Seminary; Visitor, School of Historical Studies, and **Michael Lackner**, University of Erlangen-Nuremberg; Member, School of Historical Studies

#### March 16

Classics Seminar ♦ *From Persecution to Martyrdom* ♦ **Walter Ameling**, Friedrich-Schiller-Universität, Jena; Member, School of Historical Studies

#### March 19

Historical Studies Lunchtime Colloquium ♦ *Causation in Islamic Law and Theology* ♦ **Aron Zysow**, Harvard Law School; Member, School of Historical Studies



**March 21**

Medieval Table Lunchtime Colloquium ♦ *The Performance of Jean de Joinville's French Credo* ♦ **Michael Curschmann**, Princeton University

History of Science Seminar ♦ *Imperfect Chaos: Tropical Medicine and Exotic Natural History Circa 1700* ♦ **Benjamin Schmidt**, University of Washington; Member, School of Historical Studies

**March 26**

Historical Studies Lunchtime Colloquium ♦ *Errico Malatesta in London: Anarchism, Diaspora and Globalization, 1880–1914* ♦ **Carl Levy**, Goldsmiths College, University of London; Member, School of Historical Studies

Classics Seminar ♦ *Oral Formulaic Theory: End of Story?* ♦ **Margalit Finkelberg**, Tel Aviv University; Member, School of Historical Studies

**March 27**

East Asian Studies and History of Science Joint Seminar ♦ *History of Science in Traditional Vietnam: The State of the Field* ♦ **Alexei Volkov**, National Tsing Hua University, Taiwan; Member, School of Historical Studies

Islamicist Seminar ♦ *An Early Algerian Anticolonial: Hamdan Khodja's Miroir (1833)* ♦ **Julie Taylor**, Princeton University

**March 28**

East Asian Studies Seminar ♦ *The An Lushan Rebellion and Central Asia* ♦ **Étienne de la Vaissière**, École Pratique des Hautes Études, Paris

Early Modern and Nineteenth-century Historians Workshop ♦ *Etruscans, Romans, and Italians* ♦ **Axel Körner**, University College London; Member, School of Historical Studies

Medieval Table Lunchtime Colloquium ♦ *Some Considerations in Text Editing* ♦ **Karl Shoemaker**, University of Wisconsin, Madison; Member, School of Historical Studies and **Christopher Atwood**, Indiana University; Member, School of Historical Studies

Art History Seminar ♦ *On Paul Klee* ♦ **Bettina Gockel**, University of Tuebingen; Member, School of Historical Studies

**March 30**

East Asian Studies Workshop: The Sense of the Past among Inner Asian Peoples ♦ Opening Remarks: **Peter Goddard**, Director, Institute for Advanced Study and **Nicola Di Cosmo**, Luce Foundation Professor in East Asian Studies, School of Historical Studies ♦ *Notions of History among*

*the Early Turkic Peoples* ♦ **Peter Golden**, Rutgers, The State University of New Jersey ♦ *Bägü Tāš: "Eternal Stones" and the Beginnings of Turkic Historiography* ♦ **Michael Drompp**, Rhodes College ♦ *Appearance and Significance of the Word "History" in Turkic Languages* ♦ **Eiji Mano**, Ryukoku University and Kyoto University ♦ *Historians and Their Perceptions of History in Late Pre-modern Eastern Turkestan* ♦ **Hodong Kim**, Seoul National University ♦ *Oral Tradition As a Measure of Preserving Social Identity among the Turkic Nomads of Central Asia* ♦ **Meruert Kh. Abusseitova**, Academy of Sciences of Kazakhstan ♦ *Founding a Real Dynasty: Qubilai's Views of the Early Mongol Conquest* ♦ **Christopher Atwood**, Indiana University; Member, School of Historical Studies ♦ *Buddhism and Mongol Historiography* ♦ **Johan Elverskog**, Southern Methodist University ♦ *How to Describe Mongol History: Mongol, Qing, and Japanese Scholars' Historiographies on the Mongols in the Nineteenth through Early Twentieth Centuries* ♦ **Tatsuo Nakami**, Tokyo University of Foreign Studies; Member, School of Historical Studies

**March 31**

East Asian Studies Workshop: The Sense of the Past among Inner Asian Peoples ♦ *The Ming in Manchu Memory* ♦ **Mark Elliott**, Harvard University ♦ *Chosŏn Records and Manchu Historical Traditions* ♦ **Evelyn Rawski**, University of Pittsburgh; Member, School of Historical Studies ♦ *Historical Analogy and Historical Allusions in the Early Manchu State* ♦ **Nicola Di Cosmo**, Luce Foundation Professor in East Asian Studies, School of Historical Studies ♦ *How Did the Record of the Eight Banners become the Official History?* ♦ **Naoto Kato**, Nihon University

**April 2**

Historical Studies Lunchtime Colloquium ♦ *Painting As Experiment: Chardin's Still Lifes* ♦ **Bettina Gockel**, University of Tuebingen; Member, School of Historical Studies

**April 4**

Medieval Table Lunchtime Colloquium ♦ *Medieval Periodization from an East-West Perspective* ♦ **Florin Curta**, University of Florida, Member; School of Historical Studies and **Christopher Atwood**, Indiana University; Member, School of Historical Studies

History of Science Seminar ♦ *Galen's Teleology* ♦ **Mark Schiefsky**, Harvard University; Member, School of Historical Studies

**April 10**

Art History and East Asian Studies Joint Seminar ♦ *Chinese Cinema* ♦ **Jerome Silbergeld**, Princeton University

**April 11**

History of Science Seminar ♦ *Periodicities and Period Relations in Babylonian Celestial Sciences* ♦ **Francesca Rochberg**, University of California, Riverside; Member, School of Historical Studies

**April 19**

East Asian Studies Seminar ♦ *Towards a Regional History of North-East Asia* ♦ **Evelyn Rawski**, University of Pittsburgh; Member, School of Historical Studies

**April 26**

Art History Seminar ♦ *Maximilien Luce's A Paris Street in 1871* ♦ **Alastair Wright**, Princeton University

**May 6**

Classicist-Islamicist Workshop: The Materialistic Worldview from Late Antiquity to Islam ♦ Opening Remarks and *The Dahrīs and the Formation of the Materialist Tradition* ♦ **Patricia Crone**, Andrew W. Mellon Professor, School of Historical Studies ♦ *Mechanistic Views in Late Antique Medicine* ♦ **Philip van der Eijk**, University of Newcastle upon Tyne

**May 7**

Classicist-Islamicist Workshop: The Materialistic Worldview from Late Antiquity to Islam ♦ *Nature and the Argument from Design in Alexander of Aphrodisias (fl.200) and Abu Zayd al-Balkhi (fl.900)* ♦ **Fritz Zimmermann**, Oriental Institute, Oxford ♦ *The Materialist Philosophers in the Church Fathers* ♦ **Mark Edwards**, Christ Church College, Oxford

**May 8**

Classicist-Islamicist Workshop: The Materialistic Worldview from Late Antiquity to Islam ♦ *Elements and Qualities in Galen's Hippocratism* ♦ **Mark Schiefsky**, Harvard University; Visitor, School of Historical Studies ♦ *Job of Edessa on the Simple Elements and Matter* ♦ **Dana Miller**, Fordham University

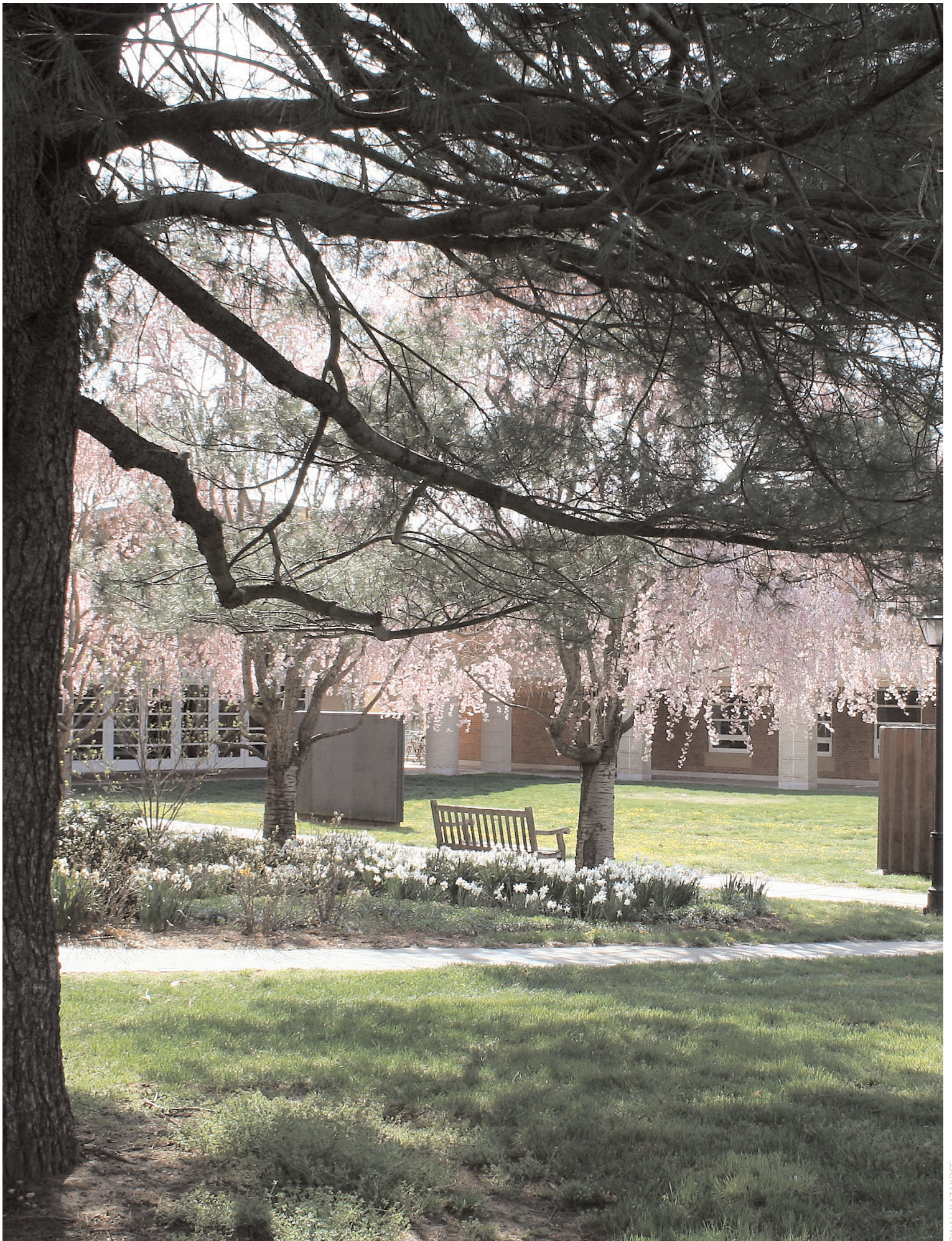
**May 9**

Classicist-Islamicist Workshop: The Materialistic Worldview from Late Antiquity to Islam ♦ *Ashab al-Taba'i' in Scientific Texts and in the Kalam: Are They the Same?* ♦ **Emma Gannagé**, Université Saint-Joseph, Beirut; Member, School of Historical Studies ♦ *The Four Elementary Qualities (taba'i') in Astrology* ♦ **Robert Morrison**, Whitman College

**May 10**

Classicist-Islamicist Workshop: The Materialistic Worldview from Late Antiquity to Islam ♦ *The Materialist Skeptic in Miskawayh's Epistle on the Soul and the Intellect* ♦ **Peter Pormann**, Warwick University, United Kingdom







# The School of Mathematics

## Faculty

**Enrico Bombieri**, IBM von Neumann Professor

**Jean Bourgain**

**Pierre Deligne**

**Phillip A. Griffiths**

**Robert P. Langlands**, Hermann Weyl Professor

**Robert MacPherson**

**Thomas Spencer**

**Vladimir Voevodsky**

**Avi Wigderson**, Herbert H. Maass Professor

## Professor Emeritus

**Atle Selberg**

During the academic year 2006–07, the School of Mathematics conducted a special program in algebraic geometry. This subject, with deep classical roots, is one of the most active areas in contemporary mathematics. Especially notable are its interconnections with number theory, mathematical physics, and topology. The scientific activities, numerous informal seminars, and exchanges and collaborations that arose during the year reflected the depth and breadth of algebraic geometry. We will briefly describe a few of these.

Two of the central areas of activity in algebraic geometry are the new categorical/homotopical methods being brought to bear on one of the central questions of algebraic geometry, namely motivic cohomology, and the fascinating set of issues related to homological mirror symmetry. The latter in large part is an outgrowth of the very rich interface between theoretical physics and mathematics, especially algebraic and symplectic geometry.

Homological mirror symmetry attracted wide interest and participation throughout the year and was the subject of two workshops, one in each term, which were supported by the National Science Foundation. The Institute provided an interdisciplinary environment and many opportunities for collaboration between string theorists, symplectic topologists, algebraic and differential geometers, and representation theorists. By bringing together researchers from all of these fields, the program aimed to proliferate the cutting-edge research in algebraic, topological, differential geometric, and string theoretic aspects of mirror symmetry, and highlight the new trends, challenges, and open problems the subject has to offer. In that respect, the activity was very successful. The seminar lectures and the formal and informal research group meetings throughout the program not only streamlined and organized the exciting new discoveries in birational geometry, moduli theory, Hodge theory, symplectic topology, and stringy geometry, but also managed to refine the creative energies of the individual participants in the program in a cohesive effort to understand the newly emerging aspects of all of the subjects involved.

Specifically, the workshops were:

- ♦ “Homological Mirror Symmetry and Applications” (January 22–26, 2007). This workshop was preceded



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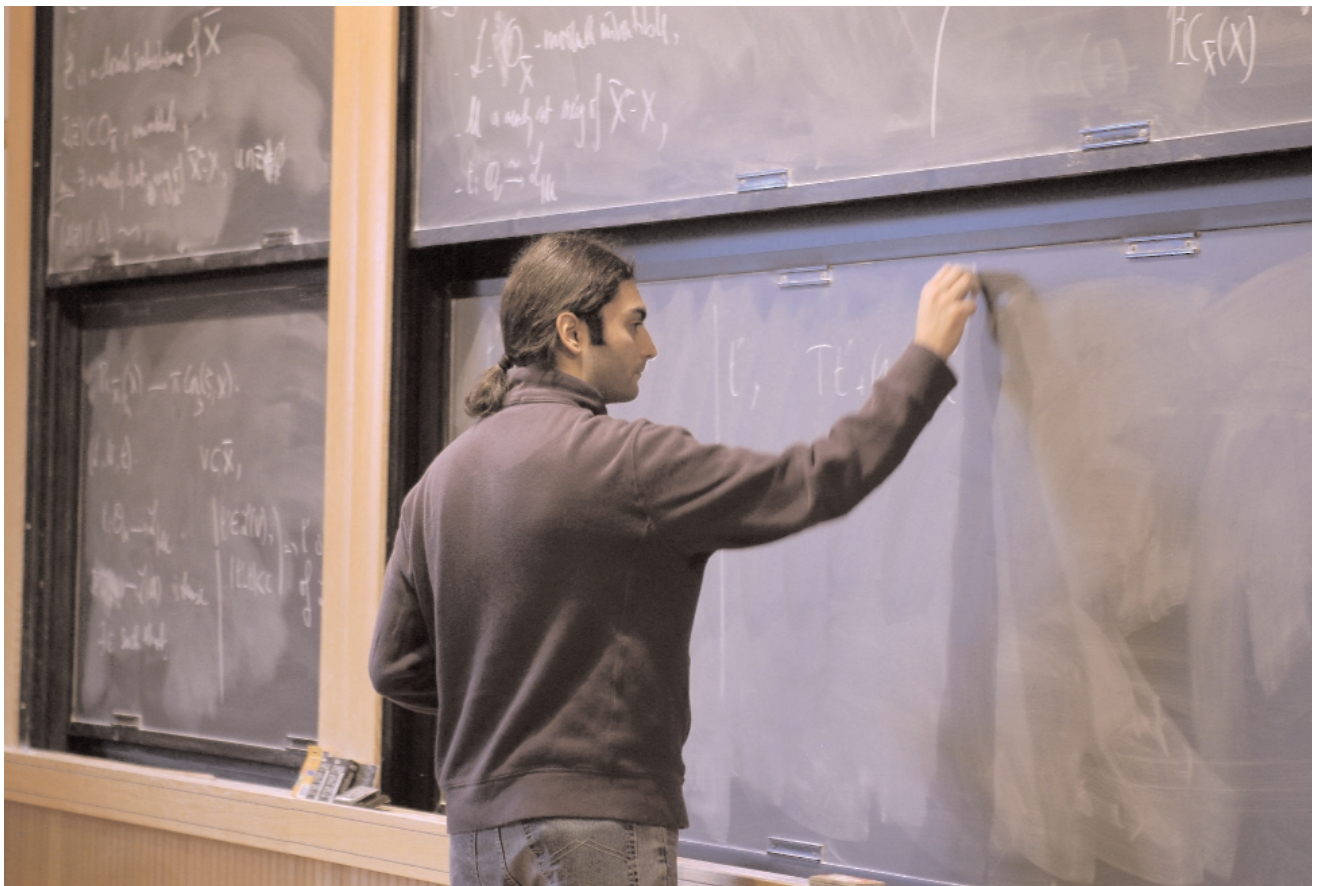
Member Joseph Ayoub presented a seminar on motivic cohomology during the School of Mathematic's special program in algebraic geometry.

by a small preparatory meeting aimed at bringing up to speed interested graduate students, young researchers, and newcomers to the field.

- ♦ “Homological Mirror Symmetry and Geometric Langlands Program” (March 26–30, 2007).

Several new ideas came out of these activities:

- ◆ Description of Fukaya categories for Fano varieties and cohomology of weak category.
- ◆ Glueing procedures for Fukaya categories and the generalized Hodge structures on periodic cyclic homology of formally smooth Calabi-Yau categories.
- ◆ Connections of homological mirror symmetry with rationality questions in higher dimensional projective geometry.
- ◆ Homological mirror symmetry methods in the study of Hodge classes and algebraic cycles.
- ◆ Description of the homology of tropical varieties and combinatorial representation of algebraic cycles on moduli spaces.
- ◆ Identification of the modular structure of duality transformations for moduli of representations of affine quivers of type  $A$ .
- ◆ Reconstruction of normal crossing smoothing parameters in terms of integral affine geometry.



- ♦ Development of algebraic procedures for extracting higher genus Gromov-Witten invariants from triangulated categories.
- ♦ New invariants of hypersurface singularities from split completed categories of matrix factorizations.
- ♦ Establishment of the homological mirror symmetry correspondence for toric varieties and for general del Pezzo surfaces.
- ♦ Description of open mirror symmetry and relative Gromov-Witten invariants in terms of invariants of normal functions.
- ♦ The study of hybrid Landau-Ginzburg models and classical integrable systems via homological projective duality.

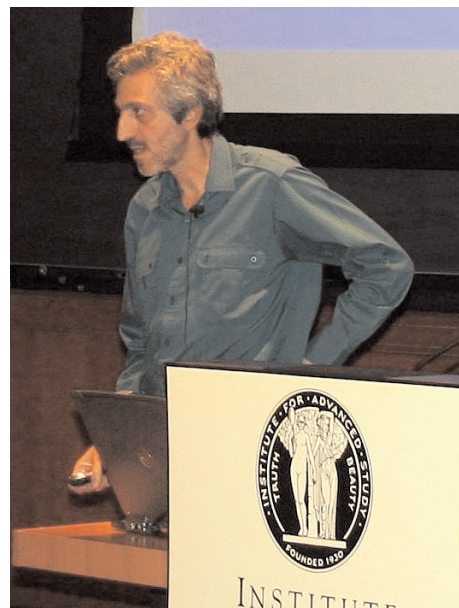
Additionally, several new collaborations have started during this activity. We are preparing a proceedings volume that will record the progress and interesting new developments in homological mirror symmetry that were communicated through the program. Many students and postdoctoral researchers were involved in the activities, as well as participants from underrepresented groups.

Categorical/homotopical aspects also attracted wide interest and participation. In particular, there was a year-long seminar on motivic cohomology. During the fall term, Institute Member Charles Weibel gave six lectures on the current status of the Bloch-Kato conjecture, which is known to have many interesting applications to number theory, algebraic geometry, and K-theory. The conjecture was reduced to the existence of “Rost motives.”

During the spring term, Members participating in the seminar presented six other topics in motivic cohomology. These included motivic cohomology operations, regulator maps, conservation conjectures, and connections to number theory and geometry. During the latter part of the term, the existence of Rost motives was established. Combining this with the reduction in the fall seminar completed the verification of the Bloch-Kato conjecture.

Another set of activities centered around the weekly seminar on complex algebraic geometry conducted during the fall by Professors Pierre Deligne and Phillip Griffiths. During the period, Members gave a number of talks on some of the most active areas in classical algebraic geometry, especially the spectacular recent work on the minimal model program. This was the topic of a beautiful series of talks, to overflow audiences, by Mircea Mustata. Other topics reflected the wide interests of the Members and Visitors. The seminar continued during the spring with an irregular schedule so as not to interfere with the two workshops and related activities.

The traditional number theory seminars, organized with the mathematics department at Princeton University, continued to attract a good group of



DINAH KAZAKOFF

Professor Avi Wigderson (above) and Visiting Professor Alexander Razborov organized two weekly seminars on theoretical computer science and discrete mathematics.

Professor Pierre Deligne (below) and Professor Phillip Griffiths conducted a weekly seminar on complex algebraic geometry that addressed some of the more active areas in classical algebraic geometry, especially the spectacular recent work on the minimal model program.



CLIFF MOORE



mathematicians from Princeton and neighboring universities.

This year we had a strong and diverse group of mathematical physicists. One of the main topics discussed was the geometric formulation of conformal field theory, in terms of the Schramm Löwner evolution and its relation to the Ising model and flow lines of the free field. Other topics included new results on band random matrices, smoothness for the quasi-geostrophic flow, and an elegant formulation of the renormalization group. In the second term, Professor Robert MacPherson gave a beautiful talk describing the equations for the evolution of grains in three dimensions. These results are of great interest for both mathematical physics and material science.

*This year we had a strong and diverse group of mathematical physicists. One of the main topics discussed was the geometric formulation of conformal field theory, in terms of the Schramm Löwner evolution and its relation to the Ising model and flow lines of the free field.*

Two weekly seminars were organized by Herbert H. Maass Professor Avi Wigderson and Visiting Professor Alexander Razborov in the program on theoretical computer science and discrete mathematics; the first with a guest speaker giving a general one-hour lecture on a broad variety of topics, and the second a more informal talk. Due to the presence of Aaron Siegel, this year there was special emphasis in the field of combinatorial game theory. In addition to his tutorial lectures, we had two talks by Elwyn Berlekamp of Berkeley and one by John Conway of Princeton. The seminars were well attended by scholars in the fields of computer science, mathematics, and economics from area universities and institutions.

In October, we had a two-day conference on the “L-Group at 40” in honor of Hermann Weyl Professor Robert Langlands’s seventieth birthday.

In March, the thirtieth Marston Morse Memorial Lectures were given by William Fulton of the University of Michigan. Three lectures were given on “Equivariant Cohomology in Algebraic Geometry.”

Also in March, János Kollár of Princeton University gave the twenty-sixth Hermann Weyl Lectures. The lectures, on rationally connected varieties, began with an introduction followed by three talks, “Arithmetic over Finite and Local fields,” “The Nash Conjecture and Topology over  $\mathbb{R}$ ,” and “The Ax Conjecture and Degenerations.”

In early June, Professor Langlands was awarded the 2007 Shaw Prize for “initiating and developing a grand unifying vision of mathematics that connects prime numbers with symmetry.” He shares the prize with Richard Taylor of Harvard University.

Professor Deligne was named a foreign associate of the National Academy of Sciences for his distinguished and continuing achievements in original research.

Professor Enrico Bombieri was awarded the Premio Internazionale Pitagora di Matematica from the City of Crotone in Italy.

Professor Robert MacPherson (right) described equations for the evolution of grains in three dimensions, which are of great interest for both mathematical physics and material science.



CLIFF MOORE



## MEMBERS AND VISITORS

### Nir Ailon

*Algorithms, Optimization* ♦ Princeton University

### Joseph Ayoub

*Algebraic Geometry* ♦ Université Paris 7, France

### Nils Baas

*Algebraic Topology* ♦ Norwegian University of Science and Technology, Norway ♦ *j, s*

### Dmitri Beliaev

*Function Theory* ♦ Institute for Advanced Study ♦ *vri*

### Amnon Besser

*Arithmetic Geometry* ♦ Ben-Gurion University, Israel  
*The Bell Companies Fellowship*  
*Funding provided by The James D. Wolfensohn Fund*

### Andrew Blumberg

*Algebraic Topology* ♦ University of Chicago

### Allan Borodin

*Complexity Theory* ♦ University of Toronto, Canada ♦ *s*

### Paul Bressler

*Characteristic Classes* ♦ The University of Arizona  
*Funding provided by The Ellentuck Fund*

### David Brydges

*Analysis* ♦ University of British Columbia, Canada ♦ *f*

### Alina Ioana Bucur

*Zeta and L-functions* ♦ Brown University

### Nero Budur

*Algebraic Geometry* ♦ Johns Hopkins University

### Kaihua Cai

*Schrödinger Equations* ♦ California Institute of Technology ♦ *f*

### Julia Chuzhoy

*Approximation* ♦ Massachusetts Institute of Technology  
*Funding provided by the State of New Jersey*

### Lisa Clay

*Automorphic Forms* ♦ Northwestern University

### Sinnou David

*Number Theory* ♦ Université Pierre et Marie Curie, France  
*Funding provided by The Ellentuck Fund*

### Mark Andrea de Cataldo

*Algebraic Geometry* ♦ SUNY at Stony Brook

### Michael Dettweiler

*Algebraic Geometry, Number Theory* ♦ University of Heidelberg, Germany ♦ *s*

### Hongjie Dong

*Differential Equations, Probability* ♦ University of Chicago

### Brent Doran

*Geometric Invariant Theory* ♦ University of Oxford, United Kingdom

### Bruno Fabre

*Algebraic Geometry* ♦ Stockholm University, Sweden

### Brooke Feigon

*Automorphic Forms* ♦ University of California, Los Angeles

### David Gabai

*Low Dimensional Topology* ♦ Princeton University ♦ *s*

### Alexandra Golubeva

*Representation Theory* ♦ Boston University ♦ *v*

### Mark Goresky

*Geometry, Automorphic Forms* ♦ Institute for Advanced Study

### Nir Halman

*Combinatorial Optimization, Stochastic Programming* ♦ Massachusetts Institute of Technology ♦ *v, s*

### Günter Harder

*Arithmetic Geometry* ♦ Max-Planck Institut für Mathematik, Germany ♦ *f*  
*Funding provided by The Oswald Veblen Fund*

### Roman Holowinsky

*Automorphic Forms* ♦ Rutgers, The State University of New Jersey

### Luc Illusie

*Algebraic Geometry* ♦ Université de Paris-Sud, France ♦ *s*  
*Funding provided by The Oswald Veblen Fund*

### Jaya Iyer

*Moduli Spaces* ♦ Institute of Mathematical Sciences, India

### William Jaco

*Topology, Geometry* ♦ University of Michigan ♦ *f*

### Ljudmila Kamenova

*Differential Geometry* ♦ Massachusetts Institute of Technology

### Ludmil Katzarkov

*Algebraic Geometry* ♦ University of California, Irvine ♦ *s*

### Tali Kaufman

*Algorithms* ♦ Massachusetts Institute of Technology ♦ *s*

### Neeraj Kayal

*Computational Complexity* ♦ Indian Institute of Technology, India  
*D. E. Shaw & Co., L.P. Membership*

### Jonathan Kelner

*Theoretical Computer Science* ♦ Massachusetts Institute of Technology  
*Funding provided by the State of New Jersey*

### Mahta Khosravi

*Analysis* ♦ Institute for Advanced Study  
*Funding provided by The Oswald Veblen Fund*

### Rowan Killip

*Spectral Theory and Random Matrices* ♦ University of California, Los Angeles ♦ *v*

### Daniel Krashen

*Homogeneous Varieties* ♦ Yale University ♦ *v, f*

### Dong Li

*Mathematical Physics, Fluid Dynamics* ♦ Princeton University

### Stephen Lichtenbaum

*Arithmetic Algebraic Geometry* ♦ Brown University ♦ *s*  
*Funding provided by The Oswald Veblen Fund*

### Wenzhi Luo

*Automorphic Forms* ♦ The Ohio State University ♦ *f*

### Sergey LySENKO

*Automorphic Forms* ♦ Université Paris 6, France

### Luca Migliorini

*Hodge Theory* ♦ University of Bologna, Italy ♦ *s*

### Sophie Morel

*Shimura Varieties* ♦ Université Paris 11, France

### Michael Movshev

*Mathematical Physics* ♦ Institute for Advanced Study ♦ *j*

### Vicente Muñoz

*Geometry, Gauge Theory* ♦ Consejo Superior de Investigaciones Científicas, Spain ♦ *s*

### Mircea Mustata

*Algebraic Geometry* ♦ University of Michigan ♦ *f*

### Irina Nenciu

*Integrable Systems, Random Matrices* ♦ Institute for Advanced Study ♦ *f*

### Bao Châu Ngô

*Algebraic Geometry, Group Theory* ♦ Université Paris 11, France ♦ *f*  
*Association of Members of the Institute for Advanced Study (AMIAS) Membership*

### Tuan Ngô Dac

*Moduli Spaces* ♦ Université Paris 13, France ♦ *f*

**Gia-Vuong Nguyen-Chu**

*Representation Theory of  $p$ -adic Groups* ♦  
University of Toronto, Canada  
Funding provided by The Weyl Fund

**Dmitry Orlov**

*Mirror Symmetry* ♦ Steklov Mathematical  
Institute, Russia ♦ *s*  
Funding provided by The Oswald Veblen Fund

**Tony Pantev**

*Algebraic Geometry* ♦ University of  
Pennsylvania ♦ *v, s*

**Dinh Huong Pham**

*Algebraic Geometry* ♦ Université Paris-Sud,  
France ♦ *f*

**Elena Poletaeva**

*Infinite-Dimensional Lie Algebras* ♦ University of  
California at Riverside ♦ *s*

**Dipendra Prasad**

*$p$ -adic Groups* ♦ Tata Institute of Fundamental  
Research, India  
Funding provided by the Friends of the Institute  
for Advanced Study and The von Neumann Fund

**Conjeeveram Rajan**

*Automorphic Forms* ♦ Max-Planck Institute für  
Mathematik, Germany ♦ *s*

**Alexander Razborov**

*Combinatorics, Computer Science* ♦ Institute for  
Advanced Study ♦ *vp*

**Valentina Riva**

*Probability, Field Theory* ♦ University of  
Oxford, United Kingdom  
Funding provided by The Giorgio and Elena  
Petronio Fellowship Fund

**Kay Rülling**

*Algebraic Geometry* ♦ École Normale  
Supérieure, France

**Alireza Salehi Golsefidy**

*Semisimple Lie Groups* ♦ Yale University ♦ *vri*

**Peter Sarnak**

*Analytic Number Theory, Automorphic Forms* ♦  
Princeton University/Institute for Advanced  
Study ♦ *s*  
Funding provided by The Oswald Veblen Fund and  
The Ambrose Monell Foundation

**Jeffrey Schenker**

*Mathematical Physics* ♦ Institute for Advanced  
Study

**Scott Sheffield**

*Probability, Field Theory* ♦ Microsoft Research

**Aaron Siegel**

*Game Theory* ♦ Mathematical Sciences  
Research Institute

**Jake Solomon**

*Gromov-Witten Invariants* ♦ Massachusetts  
Institute of Technology

**Jakob Stix**

*Algebraic Geometry* ♦ University of Bonn,  
Germany

**Mina Teicher**

*Algebraic Surfaces* ♦ Bar-Ilan University, Israel ♦ *s*

**Vladimir Trifonov**

*Theoretical Computer Science* ♦ University of  
Texas at Austin

**Nikolai Tyurin**

*Geometric Quantization* ♦ Joint Institute for  
Nuclear Research, Russia ♦ *s*

**Emanuele Viola**

*Computational Complexity Theory* ♦ Harvard  
University

**Monica Visan**

*Nonlinear PDE* ♦ University of California, Los  
Angeles

**Charles Weibel**

*K-theory, Motivic Cohomology* ♦ Rutgers, The  
State University of New Jersey  
Funding provided by The Oswald Veblen Fund

**David Whitehouse**

*Automorphic Forms* ♦ California Institute of  
Technology

*f* First Term ♦ *s* Second Term ♦ *v* Visitor ♦  
*vp* Visiting Professor ♦ *j* Joint Member  
School of Natural Sciences ♦ *vri* Veblen  
Research Instructorship

**RECORD OF EVENTS****July 11**

Special Computer Science/Discrete Math I ♦  
*The Learnability of Quantum States* ♦ **Scott  
Aaronson**, University of Waterloo

**September 18**

Mathematical Physics ♦ *Cardy's Formula for  
Certain Models of the Bond-Triangular Type* ♦  
**Lincoln Chayes**, University of California,  
Los Angeles

**September 19**

Computer Science/Discrete Math II ♦ *The  
Sum-Product Theorem and Applications* ♦ **Avi  
Wigderson**, Herbert H. Maass Professor,  
School of Mathematics

**September 25**

Computer Science/Discrete Math I ♦  
*Minimum Bounded-Degree Spanning Trees through  
Matroid Intersection* ♦ **Michel Goemans**,  
Massachusetts Institute of Technology

**September 26**

Computer Science/Discrete Math II ♦ *Sum-  
Product Theorem in Finite Fields (continued)* ♦  
**Avi Wigderson**, Herbert H. Maass Professor,  
School of Mathematics

**September 27**

Complex Algebraic Geometry ♦ *Polarized  
Logarithmic Hodge Structures and Enlargements of  
Griffiths Domain* ♦ **Sampei Usui**, Osaka  
University, Japan

**September 28**

Short Talks by Postdoctoral Members ♦  
*Central L-Values and Periods for  $GL(2)$*  ♦ **David  
Whitehouse**, California Institute of Tech-  
nology; Member, School of Mathematics ♦  
*Nonlinear Schrödinger Equations* ♦ **Monica  
Visan**, University of California, Los Angeles;  
Member, School of Mathematics ♦ *Kazhdan-  
Lusztig Polynomials (for the Symmetric Group)* ♦  
**Sophie Morel**, Université Paris 11, France;  
Member, School of Mathematics ♦ *Shifted  
Convolution Sums and Quantum Unique  
Ergodicity* ♦ **Roman Holowsinsky**, Rutgers,  
The State University of New Jersey; Member,  
School of Mathematics ♦ *Fundamental Groups  
of Algebraic Varieties in Positive Characteristic* ♦  
**Jakob Stix**, University of Bonn, Germany;  
Member, School of Mathematics ♦ *Open  
Gromov-Witten Theory* ♦ **Jake Solomon**,  
Massachusetts Institute of Technology;  
Member, School of Mathematics

**September 29**

Short Talks by Postdoctoral Members ♦ *GIT:  
Old, New, and Something for  $U$*  ♦ **Brent  
Doran**, University of Oxford; Member,  
School of Mathematics ♦ *Stochastic Geometry  
and Gaussian Free Fields* ♦ **Scott Sheffield**,  
Microsoft Research; Member, School of  
Mathematics ♦ *Random Band Matrices* ♦  
**Jeffrey Schenker**, Member, School of Math-  
ematics ♦ *Additive Chow Groups of a Field* ♦  
**Kay Rülling**, École Normale Supérieure;  
Member, School of Mathematics ♦ *Critical  
Phenomena and SLE* ♦ **Valentina Riva**,  
University of Oxford; Member, School of  
Mathematics ♦ *Some Geometric Side of the Trace  
Formula* ♦ **Dinh Huong Pham**, Université  
Paris-Sud; Member, School of Mathematics

**October 2**

Members Seminar ♦ *On the  $p$ -adic Spectra  
of Some Hecke Operators* ♦ **Lisa Clay**,  
Northwestern University; Member, School  
of Mathematics

**October 3**

Computer Science/Discrete Math II ♦  *$A$   
Randomized Polynomial-Time Simplex Algorithm  
for Linear Programming* ♦ **Jonathan Kelner**,  
Massachusetts Institute of Technology;  
Member, School of Mathematics

Short Talks by Postdoctoral Members ♦ *Some  
Homogeneity Problems in Harmonic Analysis over  
Local Fields* ♦ **Gia-Vuong Nguyen-Chu**,

University of Toronto; Member, School of Mathematics ♦ *The Discrete Nonlinear Schrödinger Equation* ♦ **Irina Nenciu**, Member, School of Mathematics ♦ *On Pseudorandomness: Constructing Low-Entropy Distributions That Look Random* ♦ **Emanuele Viola**, Harvard University; Member, School of Mathematics ♦ *Thermostats in Molecular Dynamics* ♦ **Dong Li**, Princeton University; Member, School of Mathematics ♦ *Some Higher Moment Results on Heisenberg Manifolds* ♦ **Mahta Khosravi**, Member, School of Mathematics

#### October 4

Complex Algebraic Geometry ♦ *Minimal Model Program in Dimensions 4 and 5* ♦ **Valery Alexeev**, University of Georgia

Short Talks by Postdoctoral Members ♦ *Spectral Partitioning, Eigenvalue Bounds, and Circle Packings for Graphs of Bounded Genus* ♦ **Jonathan Kelner**, Massachusetts Institute of Technology; Member, School of Mathematics ♦ *Approximation of NP-Hard Optimization Problems* ♦ **Julia Chuzhoy**, Massachusetts Institute of Technology; Member, School of Mathematics ♦ *On Hyper-Kähler Manifolds* ♦ **Ljudmila Kamenova**, Massachusetts Institute of Technology; Member, School of Mathematics ♦ *Circuit Lower Bounds and Incomplete Exponential Sums* ♦ **Vladimir Trifonov**, University of Texas at Austin; Member, School of Mathematics ♦ *Linear Group-Subgroup Pairs with the Same Invariants* ♦ **Alexandra Golubeva**, Boston University; Member, School of Mathematics ♦ *Periods and Relative Trace Formulas for  $GL(2)$  in the Local Setting* ♦ **Brooke Feigon**, University of California, Los Angeles; Member, School of Mathematics

#### October 5

IAS/PU Number Theory ♦ *Level-raising for  $GS(4)$*  ♦ **Claus Sorensen**, Princeton University

#### October 6

Fundamental Lemma ♦ *Spectral Curves for Classical Groups* ♦ **Bao Châu Ngô**, Université de Paris 11; Member, School of Mathematics

#### October 9–10

Conference on the L-Group at 40

#### October 9

Computer Science/Discrete Math I ♦ *Languages with Bounded Multiparty Communication Complexity* ♦ **Mario Szegedy**, Rutgers, The State University of New Jersey

#### October 10

Computer Science/Discrete Math II ♦ *An Invitation to Combinatorial Games* ♦ **Aaron Siegel**, Mathematical Sciences Research Institute; Member, School of Mathematics

#### October 11

Short Talks by Postdoctoral Members ♦ *Misère Games and Misère Quotients* ♦ **Aaron Siegel**, Mathematical Sciences Research Institute; Member, School of Mathematics

Short Talks by Postdoctoral Members ♦ *On Time Inhomogeneous Controlled Diffusion Processes in Domains* ♦ **Hongjie Dong**, University of Chicago ♦ *On the  $p$ -adic Spectra of Some Hecke Operators* ♦ **Lisa Clay**, Northwestern University; Member, School of Mathematics ♦ *The Identity Testing Problem* ♦ **Neeraj Kayal**, Indian Institute of Technology; Member, School of Mathematics ♦ *Dispersive Estimates for Wave Equations in the Presence of Eigenvalue and Resonance at Zero Energy in Three Dimensions* ♦ **Kaihua Cai**, California Institute of Technology; Member, School of Mathematics ♦ *Local and Global Problems on Singularities* ♦ **Nero Budur**, Johns Hopkins University; Member, School of Mathematics

#### October 12

Short Talks by Postdoctoral Members ♦ *Multiple Dirichlet Series* ♦ **Alina Ioana Bucur**, Brown University; Member, School of Mathematics ♦ *The Algebraic K-theory of Structured Ring Spectra* ♦ **Andrew Blumberg**, University of Chicago; Member, School of Mathematics ♦ *Harmonic Measure and SLE* ♦ **Dmitri Beliaev**, Member, School of Mathematics ♦ *The Grothendieck Six Operations and the Formalism of Vanishing Cycles for Motives* ♦ **Joseph Ayoub**, Université Paris 7; Member, School of Mathematics ♦ *Fast Computation of the Johnson-Lindenstrauss Dimension Reduction* ♦ **Nir Ailon**, Princeton University; Member, School of Mathematics

IAS/PU Number Theory ♦ *Convergent Hejhal-Type Algorithms* ♦ **Andrew Booker**, University of Bristol

#### October 13

Fundamental Lemma ♦ *Symmetry of the Hitchin Fibration* ♦ **Bao Châu Ngô**, Université Paris 11; Member, School of Mathematics

#### October 16

Computer Science/Discrete Math I ♦ *Randomness-Efficient Sampling within  $NC^1$*  ♦ **Alex Healy**, Harvard University

Members Seminar ♦ *The Two-dimensional Ising Model and SLE* ♦ **Valentina Riva**, University of Oxford; Member, School of Mathematics

#### October 17

Computer Science/Discrete Math II ♦ *An Invitation to Combinatorial Games* ♦ **Aaron Siegel**, Mathematical Sciences Research Institute; Member, School of Mathematics

#### October 18

Complex Algebraic Geometry ♦ *Multiplier Ideals and Singularities* ♦ **Nero Budur**, Johns

Hopkins University; Member, School of Mathematics

Mathematical Physics ♦ *On the Connection Between SLE and CFT* ♦ **Valentina Riva**, University of Oxford; Member, School of Mathematics

#### October 19

IAS/PU Number Theory ♦ *Period Integrals, Central Critical Values, and Their Local Analogue* ♦ **Dipendra Prasad**, Tata Institute of Fundamental Research; Member, School of Mathematics

#### October 20

Fundamental Lemma ♦ *On Geometric Stabilization* ♦ **Bao Châu Ngô**, Université Paris 11; Member, School of Mathematics

#### October 23

Members Seminar ♦ *Open Gromov-Witten Theory of the Quintic Threefold* ♦ **Jake Solomon**, Massachusetts Institute of Technology; Member, School of Mathematics

#### October 25

Complex Algebraic Geometry ♦ *Filtrations in Cohomology and Geometry* ♦ **Mark de Cataldo**, SUNY at Stony Brook; Member, School of Mathematics

#### October 26

Motivic Cohomology ♦ *Operations* ♦ **Charles Weibel**, Rutgers, The State University of New Jersey; Member, School of Mathematics

Birational Geometry ♦ *Finite Generation One* ♦ **Mircea Mustata**, University of Michigan; Member, School of Mathematics

IAS/PU Number Theory ♦ *Discrete Transitive Actions on the Vertices of Bruhat-Tits Buildings* ♦ **Alireza Salehi Golsefidy**, Yale University; Member, School of Mathematics

#### October 27

Fundamental Lemma ♦ *On the Fundamental Lemma for Weighted Orbital Integrals* ♦ **David Whitehouse**, California Institute of Technology; Member, School of Mathematics

Special Mathematical Physics ♦ *Loop Calculus in Statistical Physics and Information Theory* ♦ **Misha Chertkov**, Los Alamos National Laboratory

#### October 30

Computer Science/Discrete Math I ♦ *2-Source Dispersers for  $n^{o(1)}$  Entropy, and Ramsey Graphs Beating the Frankl-Wilson Construction* ♦ **Anup Rao**, University of Texas



### October 31

Computer Science/Discrete Math II ♦ 2-Source Dispersers for Sub-Polynomial Min-Entropy and Ramsey Graphs Beating the Frankl-Wilson Construction ♦ **Anup Rao**, University of Texas

Fundamental Lemma ♦ *Fundamental Remarks on the Lemma* ♦ **Günter Harder**, Max-Planck Institut für Mathematik, Germany; Member, School of Mathematics

### November 1

Complex Algebraic Geometry ♦ *Locally Residual Currents and Dolbeault Cohomology on Projective Manifolds* ♦ **Bruno Fabre**, Stockholm University; Member, School of Mathematics

Mathematical Physics ♦ *Critical 2d Models on the Annulus* ♦ **John Cardy**, Oxford University; Director's Visitor, Institute for Advanced Study

### November 2

Fundamental Lemma ♦ *Moduli of Metaplectic Bundles on Curves and Theta-Sheaves* ♦ **Sergey Lysenko**, Université Paris 6; Member, School of Mathematics

Birational Geometry ♦ *Finite Generation II* ♦ **Mircea Mustata**, University of Michigan; Member, School of Mathematics and **Nero Budur**, Johns Hopkins University; Member, School of Mathematics

IAS/PU Number Theory ♦ *A Weyl-like Bound for Automorphic L-Functions* ♦ **Jianya Liu**, Shandong University, China

### November 3

Motivic Cohomology ♦ *Steenrod and Milnor Operations* ♦ **Charles Weibel**, Rutgers, The State University of New Jersey; Member, School of Mathematics

### November 6

Computer Science/Discrete Math I ♦ *Towards Harmful Low-rate Noise Models for Quantum Computers* ♦ **Gil Kalai**, The Hebrew University of Jerusalem; Yale University

Members Seminar ♦ *Equidistribution Problems on Siegel Modular Varieties* ♦ **Wenzhi Luo**, Ohio State University; Member, School of Mathematics

### November 7

Computer Science/Discrete II ♦ *Solvability of Polynomial Equations over Finite Fields* ♦ **Neeraj Kayal**, Indian Institute of Technology, India; Member, School of Mathematics

### November 8

Complex Algebraic Geometry ♦ *Motives of Rigid Varieties and Motivic Nearby Cycles* ♦ **Joseph Ayoub**, Université Paris 7; Member, School of Mathematics

### November 9

Motivic Cohomology ♦ *Rost's Basic Correspondences* ♦ **Charles Weibel**, Rutgers, The State University of New Jersey; Member, School of Mathematics

IAS/PU Number Theory ♦ *Multiple Dirichlet Series Attached to Weyl Groups* ♦ **Solomon Friedberg**, Boston College

### November 10

Fundamental Lemma ♦ *Equivariant Homology of Affine Springer Fibers* ♦ **Mark Goresky**, Member, School of Mathematics

Birational Geometry ♦ *Finite Generation III* ♦ **Mircea Mustata**, University of Michigan; Member, School of Mathematics

Mathematical Physics ♦ *Random Band Matrices* ♦ **Jeffrey Schenker**, Member, School of Mathematics

### November 13

Computer Science/Discrete Math I ♦ *Coupon Go* ♦ **Elwyn Berlekamp**, University of California, Berkeley

Members Seminar ♦ *Random Geometry and SLE* ♦ **Scott Sheffield**, Microsoft Research; Member, School of Mathematics

### November 14

Computer Science/Discrete Math II ♦ *Cut Problems in Graphs: Algorithms and Complexity* ♦ **Julia Chuzhoy**, Massachusetts Institute of Technology; Member, School of Mathematics

Fundamental Lemma ♦ *On Geometric Stabilization* ♦ **Bao Châu Ngô**, Université Paris 11; Member, School of Mathematics

### November 15

Complex Algebraic Geometry ♦ *Compactification of Moduli Spaces of Drinfeld's Shtukas* ♦ **Tuan Ngô Dac**, Université Paris 13; Member, School of Mathematics

Members Seminar ♦ *Random Geometry and SLE II* ♦ **Scott Sheffield**, Microsoft Research; Member, School of Mathematics

### November 16

Motivic Cohomology ♦ *Rost's Basic Correspondences* ♦ **Charles Weibel**, Rutgers, The State University of New Jersey; Member, School of Mathematics

Birational Geometry ♦ *Finite Generation IV* ♦ **Mircea Mustata**, University of Michigan; Member, School of Mathematics

IAS/PU Number Theory ♦ *Intersection Complex on the Baily-Borel Compactification of Siegel Modular Variety* ♦ **Sophie Morel**, Université Paris 11; Member, School of Mathematics

### November 17

Fundamental Lemma ♦ *On Geometric Stabilization* ♦ **Bao Châu Ngô**, Université Paris 11; Member, School of Mathematics

### November 20

Analysis and Mathematical Physics ♦ *A New Approach to Universality Limits Involving Orthogonal Polynomials* ♦ **Doron Lubinsky**, Georgia Institute of Technology

Members Seminar ♦ *Regularity and Analyticity for the Dissipative Quasi-Geostrophic Equations* ♦ **Dong Li**, Princeton University; Member, School of Mathematics

### November 21

Birational Geometry ♦ *Finite Generation IV* ♦ **Nero Budur**, Johns Hopkins University; Member, School of Mathematics

### November 27

Computer Science/Discrete Math I ♦ *New Locally Decodable Codes and Private Information Retrieval Schemes* ♦ **Sergey Yekhanin**, Massachusetts Institute of Technology

Members Seminar ♦ *The Generalized de Rham-Witt Complex over a Field Is a Complex of Zero-Cycles* ♦ **Kay Rülling**, École Normale Supérieure; Member, School of Mathematics

### November 28

Computer Science/Discrete Math II ♦ *New Correlation Bounds for GF(2) Polynomials Using the Gowers Norm* ♦ **Emanuele Viola**, Harvard University; Member, School of Mathematics

Fundamental Lemma ♦ *The Case of Unitary Group* ♦ **Bao Châu Ngô**, Université Paris 11; Member, School of Mathematics

### November 29

Complex Algebraic Geometry ♦ *Singularities and Spaces of Jets* ♦ **Mircea Mustata**, University of Michigan; Member, School of Mathematics

### November 30

Birational Geometry ♦ *Moduli Spaces via Minimal Models (continued)* ♦ **Nero Budur**, Johns Hopkins University; Member, School of Mathematics

IAS/PU Number Theory ♦ *Sieve Methods for Quantum Unique Ergodicity and General Shifted Sums* ♦ **Roman Holowinsky**, Rutgers, The State University of New Jersey; Member, School of Mathematics

### December 1

Fundamental Lemma ♦ *The Case of Unitary Group* ♦ **Bao Châu Ngô**, Université Paris 11; Member, School of Mathematics

**December 4**

Computer Science/Discrete Math I ♦ *Transparent Achievement of Correlated Equilibrium* ♦ **Silvio Micali**, Massachusetts Institute of Technology

Members Seminar ♦ *The Renormalisation Group I* ♦ **David Brydges**, University of British Columbia, Canada; Member, School of Mathematics

**December 5**

Computer Science/Discrete Math II ♦ *On the Correlation between Parity and Modular Polynomials* ♦ **Vladimir Trifonov**, University of Texas at Austin; Member, School of Mathematics

**December 6**

Mathematical Physics ♦ *The Renormalisation Group II* ♦ **David Brydges**, University of British Columbia, Canada; Member, School of Mathematics

**December 7**

Motivic Cohomology ♦ *Using Rost Motives to Prove Bloch-Kato* ♦ **Charles Weibel**, Rutgers, The State University of New Jersey; Member, School of Mathematics

Complex Algebraic Geometry ♦ *Witten Equation and Singularity Theory* ♦ **Yongbin Ruan**, University of Michigan

Number Theory ♦ *Periods and Relative Trace Formulas for  $GL(2)$  in the Local Setting* ♦ **Brooke Feigon**, University of California, Los Angeles; Member, School of Mathematics

**December 8**

Fundamental Lemma ♦ *The Unitary Group Continued: The Case of Transversal Intersection* ♦ **Günter Harder**, Max-Planck Institut für Mathematik, Germany; Member, School of Mathematics

**December 11**

Computer Science/Discrete Math I ♦ *Approximation Algorithms for Combinatorial Allocation Problems* ♦ **Jan Vondrak**, Princeton University

Members Seminar ♦ *On the Geometric Langlands Functoriality for the Dual Pair  $Sp_{2n} \times SO_{2m}$*  ♦ **Sergey Lysenko**, Université Paris 6, France; Member, School of Mathematics

**December 12**

Computer Science/Discrete Math II ♦ *Cycles and Cliques Minors in Expanders* ♦ **Benny Sudakov**, Princeton University

Fundamental Lemma ♦ *The Case of Unitary Group (End)* ♦ **Bao Châu Ngô**, Université Paris 11; Member, School of Mathematics

**December 13**

Complex Algebraic Geometry ♦ *Parabolic Chern Character of the de Rham Bundles* ♦ **Jaya Iyer**, Institute of Mathematical Sciences, India; Member, School of Mathematics

Computer Science/Discrete Math III ♦ *Permanents, Determinants and Non-commutativity* ♦ **Alistair Sinclair**, University of California, Berkeley

**December 14**

Motivic Cohomology ♦ *Rost's Basic Correspondences* ♦ **Charles Weibel**, Rutgers, The State University of New Jersey; Member, School of Mathematics

Birational Geometry ♦ *Finite Generation VI: Moduli Spaces* ♦ **Nero Budur**, Johns Hopkins University; Member, School of Mathematics

**December 15**

Fundamental Lemma ♦ *The Fundamental Lemma and Change of Characteristic (following Waldspurger)* ♦ **Gia-Vuong Nguyen-Chu**, University of Toronto, Canada; Member, School of Mathematics

Mathematical Physics ♦ *The Natural Parametrization for the Schramm-Löwner Evolution* ♦ **Greg Lawler**, University of Chicago

**December 18**

Computer Science/Discrete Math I ♦ *On the Computation and Approximation of Two-player Nash Equilibria* ♦ **Xi Chen**, Tsinghua University, Beijing

**December 19**

Computer Science/Discrete Math II ♦ *Sum-Product Estimates, Expanders, and Sieving* ♦ **Alex Gamburd**, University of California at Santa Cruz

**January 15**

Computer Science/Discrete Math I ♦ *How to Rank with Few Errors: A PTAS for Weighted Feedback Arc Set on Tournaments* ♦ **Warren Schudy**, Brown University

**January 16**

Computer Science/Discrete Math II ♦ *An Elementary Construction of Constant-Degree Expanders* ♦ **Oded Schwartz**, Tel-Aviv University

Homological Mirror Symmetry ♦ *Mirror Symmetry with Mathematical Point of View. Introduction* ♦ **Dmitry Orlov**, Steklov Mathematical Institute, Russia; Member, School of Mathematics

Homological Mirror Symmetry ♦ *The Simplest Example of Homological Mirror Symmetry* ♦ **Paul Seidel**, University of Chicago; Massachusetts Institute of Technology

**January 17**

Homological Mirror Symmetry ♦ *An Introduction to Fukaya Categories of Landau-Ginzburg Models I* ♦ **Denis Auroux**, Massachusetts Institute of Technology

**January 19**

Homological Mirror Symmetry ♦ *An Introduction to Fukaya Categories of Landau-Ginzburg Models II* ♦ **Denis Auroux**, Massachusetts Institute of Technology

**January 22 – 26**

Algebraic Geometry Workshop ♦ *Workshop on Homological Mirror Symmetry and Applications I*

**January 22**

Computer Science/Discrete Math I ♦ *On the Condition Number of a Randomly Perturbed Matrix* ♦ **Van Vu**, Rutgers, The State University of New Jersey

**January 23**

Computer Science/Discrete Math, II ♦ *The Polynomial Identity Testing Problem* ♦ **Neeraj Kayal**, Indian Institute of Technology; Member, School of Mathematics

**January 25**

IAS/PU Number Theory ♦ *Multiple Dirichlet Series and Moments of L-Functions* ♦ **Alina Ioana Bucur**, Brown University; Member, School of Mathematics

**January 29**

Computer Science/Discrete Math I ♦ *Secure Multiparty Quantum Computation* ♦ **Michael Ben-Or**, Hebrew University, Jerusalem

Homological Mirror Symmetry ♦ *Deformations of Derived Equivalences* ♦ **Jonathan Block**, University of Pennsylvania

**January 30**

Computer Science/Discrete Math II ♦ *On Approximate Majority and Probabilistic Time* ♦ **Emanuele Viola**, Harvard University; Member, School of Mathematics

**February 5**

Homological Mirror Symmetry ♦ *Fukaya Category for Riemann Surfaces* ♦ **Mohammed Abouzaid**, University of Chicago

Computer Science/Discrete Math I ♦ *Integral Lexicographic Codes* ♦ **John Conway**, Princeton University

**February 6**

Computer Science/Discrete Math II ♦ *Algebraic Property Testing* ♦ **Tali Kaufman**, Massachusetts Institute of Technology; Member, School of Mathematics  
Motivic Cohomology ♦ *An Approach to the Conservation of the Nearby Motive Functor* ♦ **Joseph Ayoub**, Université Paris 7; Member, School of Mathematics

## February 7

Mathematical Physics ♦ *Random Conformal Snowflakes* ♦ **Dmitri Beliaev**, Member, School of Mathematics

## February 8

IAS/PU Number Theory ♦ *Rankin-Selberg without Unfolding and Gelfand Pairs* ♦ **Andrei Reznikov**, Bar Ilan University

## February 12

Computer Science/Discrete Math I ♦ *Biased Positional Games and Thin Hypergraphs with Large Covers* ♦ **Michael Krivelevich**, Tel-Aviv University

## February 13

Computer Science/Discrete Math II ♦ *Fast Johnson-Lindenstrauss Transform(s)* ♦ **Nir Ailon**, Princeton University; Member, School of Mathematics

Motivic Cohomology ♦ *The Syntomic Regulator for  $K_1$  of Surfaces* ♦ **Amnon Besser**, Ben-Gurion University, Israel; Member, School of Mathematics

## February 16

Mathematical Physics ♦ *Optimal Transport and Geometric Inequalities* ♦ **Cedric Villani**, École Normale Supérieure de Lyon

## February 19

Computer Science/Discrete Math I ♦ *Unbalanced Expanders and Randomness Extractors from Parvaresh-Vardy Codes* ♦ **Salil Vadhan**, Harvard University

## February 20

Computer Science/Discrete Math II ♦ *Algebraic Property Testing—Part II* ♦ **Tali Kaufman**, Massachusetts Institute of Technology; Member, School of Mathematics

Homological Mirror Symmetry ♦ *On Stability Conditions, Donaldson-Thomas Invariants and Cluster Algebras* ♦ **Maxim Kontsevich**, Institut des Hautes Études Scientifiques

## February 21

Mathematical Physics ♦ *Full Regularity for the Dissipative Quasi-Geostrophic Equations* ♦ **Hongjie Dong**, University of Chicago; Member, School of Mathematics

## February 22

Homological Mirror Symmetry ♦ *Smoothness and Compactness in Derived Geometry* ♦ **Maxim Kontsevich**, Institut des Hautes Études Scientifiques

Motivic Cohomology ♦ *Arithmetic Cohomology and Special Values of Zeta-Functions (after Geisser)* ♦ **Stephen Lichtenbaum**, Brown University

IAS/PU Number Theory ♦ *On the Computation of  $p$ -adic Height Pairings on Jacobians of Hyperelliptic Curves* ♦ **Amnon Besser**, Ben-Gurion University, Israel; Member, School of Mathematics

## February 26

Computer Science/Discrete Math I ♦ *Hardness Amplification for Errorless Heuristics* ♦ **Andrej Bogdanov**, Center for Discrete Mathematics & Theoretical Computer Science

Homological Mirror Symmetry ♦ *Derived Algebraic Geometry* ♦ **Gabriele Vezzosi** ♦ Università di Firenze

## February 27

Computer Science/Discrete Math II ♦ *A Product Theorem in Free Groups* ♦ **Alexander Razborov**, Visiting Professor, School of Mathematics

## March 1

Motivic Cohomology ♦ *Bass'  $NK$  Groups and  $cdh$ -Fibrant Hochschild Homology* ♦ **Charles Weibel**, Rutgers, The State University of New Jersey; Member, School of Mathematics

IAS/PU Number Theory ♦ *Applications of the Relative Trace Formula to Central  $L$ -Values* ♦ **David Whitehouse**, California Institute of Technology; Member, School of Mathematics

## March 5

Computer Science/Discrete Math I ♦ *Efficient Algorithms Using the Multiplicative Weights Update Method* ♦ **Satyen Kale**, Princeton University

Hermann Weyl Lectures ♦ *Rationally Connected Varieties—Introduction* ♦ **János Kollár**, Princeton University

Homological Mirror Symmetry ♦ *Pseudoholomorphic Quilts and Relative Floer Theory* ♦ **Christopher Woodward**, Rutgers, The State University of New Jersey

## March 6

Computer Science/Discrete Math II ♦ *A Product Theorem in Free Groups (Continued)* ♦ **Alexander Razborov**, Visiting Professor, School of Mathematics

Hermann Weyl Lectures ♦ *Arithmetic over Finite and Local Fields* ♦ **János Kollár**, Princeton University

## March 7

Complex Algebraic Geometry ♦ *Canonical Frames for Nonholonomic Vector Distributions* ♦ **Igor Zelenko**, International School for Advanced Studies, Trieste, Italy

Mathematical Physics ♦ *The Geometry of Grains* ♦ **Robert MacPherson**, Professor, School of Mathematics

## March 8

Motivic Cohomology ♦ *Operations with Integer Coefficients (After Voevodsky)* ♦ **Charles Weibel**, Rutgers, The State University of New Jersey; Member, School of Mathematics  
Hermann Weyl Lectures ♦ *The Nash Conjecture and Topology over  $\mathbb{R}$*  ♦ **János Kollár**, Princeton University

IAS/PU Number Theory ♦ *Subconvexity, Entropy and Equidistribution of Periodic Tors Orbits* ♦ **Elon Lindenstrauss**, Princeton University

## March 12

Computer Science/Discrete Math I ♦ *Disjoint Paths in Networks* ♦ **Sanjeev Khanna**, University of Pennsylvania

Hermann Weyl Lectures ♦ *The  $Ax$  Conjecture and Degenerations* ♦ **János Kollár**, Princeton University

Homological Mirror Symmetry ♦ *Derived Categories of Singularities* ♦ **Dmitry Orlov**, Steklov Mathematical Institute, Russia; Member, School of Mathematics

## March 13

Computer Science/Discrete Math II ♦ *The Design and Analysis of Simple Algorithms (for Search and Optimization)* ♦ **Allan Borodin**, University of Toronto; Member, School of Mathematics

Mathematical Physics ♦ *Transfer Matrix Methods for Discrete Schroedinger Operators* ♦ **Hermann Schulz-Baldes**, University of Erlangen, Germany

## March 14

Complex Algebraic Geometry ♦ *On the Abel-Radon Transform of Locally Residual Currents with Respect to a Family of Complete Intersections* ♦ **Bruno Fabre**, Stockholm University, Sweden; Member, School of Mathematics

## March 15

Motivic Cohomology ♦ *Cycles on Complete Intersections* ♦ **Jaya Iyer**, Institute of Mathematical Sciences, India; Member, School of Mathematics

IAS/PU Number Theory Seminar ♦ *Mixed Hodge Polynomials of Character Varieties* ♦ **Fernando Rodriguez Villegas**, University of Texas at Austin

## March 19

Computer Science/Discrete Math I ♦ *A Cryptographic Study of Secure Internet Measurement* ♦ **David Xiao**, Princeton University

## March 19–20

Marston Morse Lectures ♦ *Equivariant Cohomology in Algebraic Geometry* ♦ **William Fulton**, University of Michigan



**March 20**

Computer Science/Discrete Math II ♦ *The Design and Analysis of Simple Algorithms: Part II* ♦ **Allan Borodin**, University of Toronto; Member, School of Mathematics

**March 22**

IAS/PU Number Theory ♦ *Heights of Subvarieties of Abelian Varieties* ♦ **Sinnou David**, Université Pierre et Marie Curie, France; Member, School of Mathematics

**March 26**

Computer Science/Discrete Math I ♦ *Near-Optimal Algorithms for Maximum Constraint Satisfaction* ♦ **Konstantin Makarychev**, Princeton University

**March 26 – 30**

Algebraic Geometry Workshop ♦ *Homological Mirror Symmetry and Applications II*

**March 27**

Computer Science/Discrete Math II ♦ *Pseudo-Random Number Generation by Algebraic Means* ♦ **Andrew Klapper**, University of Kentucky

**March 29**

IAS/PU Number Theory ♦ *Local-Global Compatibility in  $p$ -adic Langlands for  $GL_2(Q)$*  ♦ **Matthew Emerton**, Northwestern University

**April 2**

Computer Science/Discrete Math I ♦ *Data-powered Computing* ♦ **Bernard Chazelle**, Princeton University

Homological Mirror Symmetry ♦ *The Categorification of Vassiliev Theory* ♦ **Nadya Shirokova**, Stanford University

**April 3**

Computer Science/Discrete Math II ♦ *Pseudo-Random Number Generation by Algebraic Means (continued)* ♦ **Andrew Klapper**, University of Kentucky

**April 4**

Special Lecture ♦ *Some Results in Differential Cohomology* ♦ **James Simons**, Renaissance Technologies and **Dennis Sullivan**, SUNY at Stony Brook

**April 9**

Computer Science/Discrete Math I ♦ *The Complexity of Nash Equilibria* ♦ **Christos Papadimitriou**, University of California, Berkeley

**April 10**

Computer Science/Discrete Math II ♦ *Aggregating Inconsistent Information: Ranking and Clustering* ♦ **Nir Ailon**, Princeton University; Member, School of Mathematics

Complex Algebraic Geometry ♦ *Wonderful Compactification of an Arrangement of Subvarieties* ♦ **Li Li**, Korea Institute for Advanced Study

Special Joint IAS/PU Number Theory ♦ *Iwasawa Theory and Non-Abelian Class Field Theory* ♦ **Kazukiyo Fujiwara**, Nagoya University

**April 11**

Homological Mirror Symmetry ♦ *A Differential Equation for the Open Gromov-Witten Potential* ♦ **Jake Solomon**, Massachusetts Institute of Technology; Member, School of Mathematics

**April 12**

Motivic Cohomology ♦ *Overconvergent Homotopy Invariant Presheaves with Transfers over Smooth Rigid Varieties* ♦ **Joseph Ayoub**, Université Paris 7, France; Member, School of Mathematics

IAS/PU Number Theory ♦ *A Construction of Kahane Polynomials* ♦ **Enrico Bombieri**, IBM von Neumann Professor, School of Mathematics

**April 16**

Computer Science/Discrete Math I ♦ *Fully Polynomial Time Approximation Schemes for Stochastic Dynamic Programs* ♦ **Nir Halman**, Massachusetts Institute of Technology; Visitor, School of Mathematics

**April 17**

Computer Science/Discrete Math II ♦ *Expanders in Number Theory* ♦ **Peter Sarnak**, Princeton University; Member, School of Mathematics

**April 19**

Motivic Cohomology ♦ *Completion of the Proof of the Bloch-Kato Conjecture* ♦ **Charles Weibel**, Rutgers, The State University of New Jersey; Member, School of Mathematics

IAS/PU Number Theory ♦ *On a Conjecture of Greenberg on Iwasawa Invariants of Totally Real Number Fields* ♦ **Conjeeveram Rajan**, Max-Planck Institute für Mathematik, Germany; Member, School of Mathematics

**April 23**

Computer Science/Discrete Math I ♦ *Designing Efficient Program Checkers by Delegating Their Work* ♦ **Guy Rothblum**, Massachusetts Institute of Technology

**April 24**

Computer Science/Discrete Math II ♦ *Consensus Clustering, Hierarchical Clustering and Phylogeny* ♦ **Nir Ailon**, Princeton University; Member, School of Mathematics

**April 26**

IAS/PU Number Theory ♦ *A Product Theorem in (Virtually) Free Groups* ♦ **Alexander Razborov**, Visiting Professor, School of Mathematics

**April 30**

Computer Science/Discrete Math I ♦ *History of the Theory of Error-correcting Codes* ♦ **Elwyn Berlekamp**, University of California, Berkeley

**May 1**

Computer Science/Discrete Math II ♦ *One-way Multi-party Communication Lower Bound for Pointer Jumping with Applications* ♦ **Emanuele Viola**, Harvard University; Member, School of Mathematics

**May 3**

IAS/PU Number Theory ♦ *Primes and Orbits* ♦ **Peter Sarnak**, Princeton University; Member, School of Mathematics

**May 7**

Computer Science/Discrete Math I ♦ *Reachability Problems: An Update* ♦ **Eric Allender**, Rutgers, The State University of New Jersey

**May 8**

Computer Science/Discrete Math II ♦ *An Exponential Time/Space Speedup for Resolution* ♦ **Toniann Pitassi**, University of Toronto

**May 10**

IAS/PU Number Theory ♦ *The Existence of Bessel Functionals* ♦ **Ramin-Takloo-Bighash**, Princeton University

**May 14**

Computer Science/Discrete Math I ♦ *Approximation Algorithms for Buy-at-Bulk Network Design* ♦ **Chandra Chekuri**, University of Illinois at Urbana-Champaign

**May 14–25**

Program for Women and Mathematics

**May 17**

Computer Science/Discrete Math II ♦ *Proof of the Parallel Repetition Theorem* ♦ **Boaz Barak**, Princeton University

**May 22**

Computer Science/Discrete Math I ♦ *Expander Codes and Somewhat Euclidean Explicit Sections* ♦ **Alexander Razborov**, Visiting Professor, School of Mathematics

Complex Algebraic Geometry ♦ *Abelian Relations on Webs and Abelian Families of  $\sigma$ -Cycles* ♦ **Bruno Fabre**, Stockholm University, Sweden; Member, School of Mathematics

**June 5**

Computer Science/Discrete Math I ♦ *Fast Dimension Reduction Using Rademacher Series on Dual BCH Codes* ♦ **Nir Ailon**, Princeton University; Member, School of Mathematics

# Program For Women and Mathematics

The fourteenth annual Program for Women and Mathematics was held at the Institute for Advanced Study from May 14–25, 2007. The program, whose research topic was “Algebraic Geometry and Group Actions,” was sponsored by the Institute and Princeton University and generously supported by the National Science Foundation and The Starr Foundation.

The goal of the program is to encourage undergraduate and graduate student participants to continue their mathematics education. Research mathematicians offer lectures and seminars on a focused topic, as well as mentoring, discussions on peer relations, and an introduction to career opportunities.

Including teacher assistants and lecturers, there were thirteen postdoctoral mathematicians, twenty-two graduate students, and eighteen undergraduates who participated in the program. Mentors and students were accommodated in the Institute’s housing complex, which gave them an opportunity to meet Institute Members and mathematicians from neighboring institutions.

Antonella Grassi of the University of Pennsylvania served as the organizer of the program this year. The first half of the advanced course, “Quotients of Algebraic Varieties by Group Actions,” was given by Frances Kirwan of the University of Oxford. Venkatramani Lakshmibai of Northeastern University gave the second half of the course, titled “Flag Varieties.” Wei Ho of Princeton University and Lauren Williams of Harvard University served as teacher assistants.

Amy Ksir of the United States Naval Academy and Jessica Sidman of Mount Holyoke College shared responsibility for the beginning lecture course. “Enumerative Geometry and String Theory” was the title of Amy Ksir’s course, and Jessica Sidman spoke on “Toric Varieties.” Teacher assistants were Diane Davis of Colorado State University and Milena Hering of the University of Minnesota.

Elizabeth Gasparim of Edinburgh University organized the research seminars, which were as follows: Melissa Liu, Columbia University, “A Formula of Two-partition Hodge Integrals”; Alessia Mandini, University of Bologna, Italy, “Some Results on the Moduli Spaces of Polygons”;

Angela Gibney, University of Pennsylvania, “Equations and Degenerations I”; Diane Maclagan, Rutgers, The State University of New Jersey, “Equations and Degenerations II”; Jie Sun, University of Alberta, Canada, “Descent Construction For Central Extensions of Infinite Dimensional Lie Algebras”; Elena Poletaeva, Institute for Advanced Study, “Lie Algebras and Superalgebras of Vector Fields”; Milena Hering, University of Minnesota, “Syzygies of Toric Varieties”; Alexandra Golubeva, Institute for Advanced Study, “The Main Theorem of Galois Theory for Algebraic Groups”; Chelsea Walton, University of Michigan, “Noncommutative Algebraic Geometry”; Lauren

The goal of the Program for Women and Mathematics is to encourage undergraduate and graduate participants to continue their mathematics education.



CLIFF MOORE

Williams, Harvard University, “Total Positivity and the Grassmannian”; Susan Sierra, University of Michigan, “Noncommutative Algebraic Geometry and a General Homological Kleiman–Bertini Theorem”; Elizabeth Gasparim, Edinburgh University, “Groups Structures on Local Moduli”; and Elizabeth Beazley, University of Chicago, “Codimensions of Newton Strata in the Affine Flag Manifold.”

Two colloquia were part of the afternoon activities. Andrei Okounkov of Princeton University spoke on “Completed Cycles,” and William Fulton of the University of Michigan lectured on “Equivariant Cohomology of  $G/B$ .”

The Women-in-Science seminar was organized by Katy Bold and Melanie Wood, both of Princeton University. Seven seminars were held in the afternoons, and speakers included Helen Grundman of Bryn Mawr College who spoke on “Identifying and Clarifying Your Personal Teaching Philosophy,” and Arlene Fiore of the National Oceanic Atmospheric Association who talked about “Estimating Natural vs. Anthropogenic Contributions to Surface Ozone Smog: Implications for Air Quality Policy.” There was “A Chat with Karen [Uhlenbeck]” and panel discussions about how to survive graduate school, women in mathematics, a day in the life of a mathematician, and a “Woman President.”



CLIFF MOORE

On May 18, the program participants were bused to the campus of Princeton University for Princeton Day where they toured the campus, listened to lectures, and were treated to both lunch and dinner.

The Institute for Advanced Study and the School of Mathematics appreciate the dedication of the senior women who have graciously given their time and talents since the inception of the program in 1994. Organizers, program committee members, and lecturers have all contributed to the growth and success of the women’s program. In the past fourteen years, many young women in the field of mathematics, or contemplating entering the field, were encouraged and supported by Karen Uhlenbeck, the program founder, and her collaborator and coorganizer Chuu-Lian Terng. The commitment to the program’s goals has been unparalleled.

Questionnaires were distributed to the participants on the last day in order to gain feedback about the structure and quality of the program. Both undergraduates and graduate students expressed their appreciation at being able to come to the Institute and participate in the program activities. Many commented that they felt more motivated and focused about mathematics. The questionnaires confirmed the success of this year’s program, and we look forward to hosting it in 2008.

Participants attended courses and seminars on the year’s research topic, “Algebraic Geometry and Group Actions.”





BLOOMBERG  
HALL



# The School of Natural Sciences

Faculty

**Stephen L. Adler**

**Peter Goldreich**

**Arnold J. Levine**

**Juan Maldacena**

**Nathan Seiberg**

**Scott Tremaine**, Richard Black Professor (*from 1/1/07*)

**Edward Witten**, Charles Simonyi Professor

Professor Emeritus

**Freeman J. Dyson**

## ACADEMIC ACTIVITIES

Professor **Stephen Adler** worked in three areas last year: (1) phenomenology of modified forms of quantum theory, (2) particle physics phenomenology relating to the PVLAS experiment, and to pion-pion scattering current algebra sum rules, and (3) open system dynamics.

In work relating to tests of modified forms of quantum theory, Adler wrote a paper that makes quantitative estimates of lower and upper bounds on the parameter that sets the magnitude of the stochastic noise term in the modified Schrödinger equation of the continuous spontaneous localization (CSL) model for state vector reduction. The lower bound comes from an analysis of latent image formation in photography and etched track detectors, while the upper bound comes from a consideration of heating of the intergalactic medium. The results suggest that to account for latent image formation, the stochastic process must be eight to nine orders of magnitude stronger than conventionally assumed. This should make tests of stochastic localization models feasible in the next decade or two.

In work on the PVLAS experiment, Adler analyzed effects resulting from vacuum birefringence in a rotating magnetic field, and showed that claims of an infinite set of sidebands are incorrect.

In work on pion-pion current algebra sum rules, Adler (with F.J. Ynduráin) analyzed a sum rule proposed by Adler in 1965, which is a pion analog of the celebrated Adler-Weisberger sum rule. In 1965 there was not sufficiently good data on pion-pion scattering to definitively check this sum rule. There is now very good data on pion-pion scattering, a subject in which Ynduráin and his collaborators have played a very prominent role. A reanalysis of the pion-pion sum rule shows that it is satisfied to better than 6 percent, well within experimental and off-shell extrapolation errors. Furthermore, as Adler suggested in 1965, the new analysis shows that a large S-wave cross section plays a dominant role in saturating the sum rule.

In work on open system dynamics, Adler proposed a density tensor hierarchy that generalizes the standard reduced density matrix, in which classical noise is averaged out, or quantum noise is traced out by tracing over the environment. The hierarchy takes the form of an operator acting on the tensor product of  $n$  copies

of the system Hilbert space, and retrieves information about the classical or quantum noise that can be represented without reference to detailed noise properties in the classical case, or without reference to specific bases in the environment (or “bath”) Hilbert space in the quantum noise case.

During the 2006–07 academic year, Professor **Peter Goldreich** worked on the project, “Spontaneous Axisymmetry Breaking of the External Magnetic Field at Saturn.”

Saturn’s magnetic field is remarkably axisymmetric. Early evidence for nonaxisymmetry came from the periodicity of Saturn’s kilometric radio bursts (SKR). Subsequently, percent-level variations of the SKR period were found to occur on time scales of years. A recent breakthrough has been the direct detection of a nonaxisymmetric component of the field that rotates with a period close to that of the SKR and whose magnitude varies only weakly with distance from Saturn. The latter implies that it must be supported by currents external to the planet. We explored the hypothesis that centrifugally driven convection spontaneously breaks the axisymmetry of the external magnetic field at Saturn. The density of the outflowing plasma close to its source is assumed to contain a substantial part that varies as  $\cos \phi$  and rotates uniformly. We demonstrated that the plasma stream must narrow with distance from the planet, while the field-aligned currents joining stream to ionosphere increase rapidly. These currents produce a nonaxisymmetric component of magnetic field whose magnitude varies inversely with radial distance in the planet’s equatorial plane. For a rate of plasma outflow  $10^4 \lesssim dM/dt \lesssim 10^5 \text{ g s}^{-1}$ , this component’s strength is compatible with that observed. Additionally, we postulate that the SKR is associated with the narrow range of longitudes over which large currents flow along magnetic field lines connecting the tip of the outflow to the auroral ionosphere.

This research was done in collaboration with his former graduate student, Alison Farmer, currently a member of the Harvard Society of Fellows, and has been published in the *Journal of Geophysical Research*.

During the 2006–07 academic year, Professor **Arnold J. Levine** worked on the research described below.

Professor Peter Goldreich (seated center) explored the hypothesis that centrifugally driven convection spontaneously breaks the axisymmetry of the external magnetic field at Saturn.



CLIFF MOORE

A project (with Raúl Rabadán and Michael Krasnitz), employing large datasets of genome sequences from influenza viruses, studied the evolution of these viruses over time (a one-hundred-year period)—in different animal hosts, and from diverse geographical locations—in order to develop algorithms to identify genetic sequence preferences and diversity in different hosts; uncover the nature of the nonrandom pattern of chromosome segregation during epidemics; and develop algorithms to predict next year’s epidemic and possibly pandemic strains. Having



accomplished the first two goals, work continues on the third problem. We have devised new algorithms to uncover short sequences in the genome that encode signals that regulate expression of genes. Some of these signals act at the DNA level and some at the RNA level, and the two classes of regulation can be separated. Employing these ideas, we have designed a new chromosome sequence for immunization with the Human Immunodeficiency Virus DNA that increased protein production by 50 percent and the immune response by 500 percent in mice.

A second project (with Jiri Vanicek) using four of the human herpes viruses, proposed a plausible model to explain how these viruses remain in a latent state in the human body for years and reactivate in response to stress. These ideas were tested in a laboratory at Princeton University and found to be largely correct.

Employing single nucleotide polymorphisms (SNPs) that were uncovered in a research laboratory collaboration (a project with Gurinder Atwal), we described a novel method to discover human genes under recent positive selection (three such genes have been uncovered) and correlated their impact upon fecundity and disease states. This has led to methods for identifying individuals who are predisposed to develop cancers at a young age and women who are having difficulties with implantation of embryos into the uterus. We are also exploring the interrelationships among several cellular signal transduction pathways that are employed in the development of an organism and are often altered in disease states.

A collaboration (with Alexei Vazquez and Gareth Bond) looked at SNPs to uncover or better understand the functions of genes and their interactions within the p53 stress response pathway by identifying SNPs with significant differential effects on the expression of the gene's mRNA or protein, and looking for a differential response of those SNPs on the stress response to drug-induced growth inhibition.

During this academic year, Professor **Juan Maldacena**'s main research effort has been on the gauge/string duality (or AdS/CFT). Maldacena and his student Diego Hofman identified the simplest excitations carrying momentum  $p$  as certain extended strings in  $AdS_5 \times S^5$ . In addition, the scattering amplitude between two elementary excitations was computed at leading order. Separately, Maldacena and Ian Swanson considered a particularly simple limit in this problem that makes it more tractable. Maldacena (with Nick Dorey and Hofman) explained the physical origin of some of the singularities in these scattering amplitudes. Maldacena, with Luis Fernando Alday, considered the problem of computing

*We have devised new algorithms to uncover short sequences in the genome that encode signals that regulate expression of genes. Some of these signals act at the DNA level and some at the RNA level, and the two classes of regulation can be separated. Employing these ideas, we have designed a new chromosome sequence for immunization with the Human Immunodeficiency Virus DNA that increased protein production by 50 percent and the immune response by 500 percent in mice.*

The Simons Center for Systems Biology, which is headed by Professor Arnold Levine (not pictured), and The Cancer Institute of New Jersey hosted "The Governor's Conference on Effective Partnering in Cancer Research" at the Institute in June. Research by Professor Levine and Members has led to methods for identifying individuals who are predisposed to develop cancers at a young age.



DINAH KAZAKOFF

gluon scattering amplitudes in  $\mathcal{N} = 4$  super Yang Mills at strong coupling using strings in AdS space. In an unrelated project, Maldacena in collaboration with Daniel Baumann, Anatoly Dymarsky, Igor R. Klebanov, Liam McAllister, and Arvind Murugan, considered the problem of computing certain corrections to the motion of D3 branes in certain warped compactifications that are relevant for inflation models.

During the past year, Professor **Nathan Seiberg** continued his work on supersymmetry breaking. In particular, he followed his earlier work with Kenneth Intriligator and David Shih (ISS) about supersymmetry breaking in a metastable vacuum in the supersymmetric version of QCD (SQCD). This work demonstrated that dynamical metastable supersymmetry breaking is generic and common, and therefore it is more useful than previously expected.

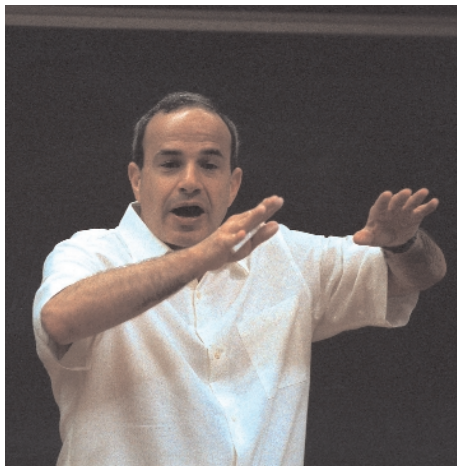
The subject of the possible embedding of the ISS scheme in string theory was explored by various authors. Cristina Bena, Elie Gorbato, Simeon Hellerman, Seiberg, and Shih examined the M-theory version of SQCD, which is known as MQCD. In the IIA limit, this theory appears to have a supersymmetry-breaking brane configuration that corresponds to the metastable state of  $N=1$  SQCD. However, the behavior at infinity of this nonsupersymmetric brane construction differs from that of the supersymmetric ground state of MQCD. These authors interpreted this to mean that it is not a meta-stable state in MQCD, but rather a state in another theory.

The phenomenological, model building implications of the ISS scheme and related theories were examined by various people. Following some of these developments, Ofer Aharony and Seiberg constructed a very simple, natural and controllable model of gauge-mediated supersymmetry breaking.

A crucial element in models of supersymmetry breaking is associated with their R-symmetry. An old result of Ann E. Nelson and Seiberg relates spontaneous supersymmetry breaking to the existence of a continuous R-symmetry. The latter is problematic for obtaining gaugino masses and avoiding light R-axions. Following the developments of metastable supersymmetry breaking, this subject was reexamined by Intriligator, Seiberg, and Shih. Here the situation is improved because these models generically have only an approximate R-symmetry. Based on this, they argued, with mild assumptions, that metastable supersymmetry breaking is inevitable. They also illustrated various general issues regarding spontaneous and explicit R-symmetry breaking, using simple toy models of supersymmetry breaking.

Although most of Seiberg's work during the year has centered around low energy supersymmetry breaking, together with Michael Dine he elucidated the physics underlying "anomaly mediation," giving several alternative derivations of the formulas for gaugino and scalar masses. They stressed that this phenomenon is of a type familiar in field theory, and does not represent an anomaly, nor does it depend on supersymmetry breaking and its mediation. Analogous phenomena are common in quantum field theory and this particular phenomenon occurs also in supersymmetric theories without gravity.

Professor Nathan Seiberg continued his work on supersymmetry breaking and demonstrated that dynamical metastable supersymmetry breaking is generic and common, and therefore it is more useful than previously expected.



RANDALL HAGADORN

Intriligator and Seiberg coauthored a review from a modern perspective of the subject of spontaneous supersymmetry breaking. This review was based on lectures given by the authors in 2007 at various schools. First they considered supersymmetry breaking in a semiclassical theory. They illustrated it with several examples, demonstrating different phenomena, including metastable supersymmetry breaking. Then they gave a brief review of the dynamics of supersymmetric gauge theories. Finally, they used these dynamics to present various mechanisms for dynamical supersymmetry breaking.

Richard Black Professor **Scott Tremaine** arrived at the Institute in January 2007. Together with James Binney (Oxford), he is completing a major revision of *Galactic Dynamics*, a graduate-level textbook on the structure and evolution of stellar systems, to be published by Princeton University Press.

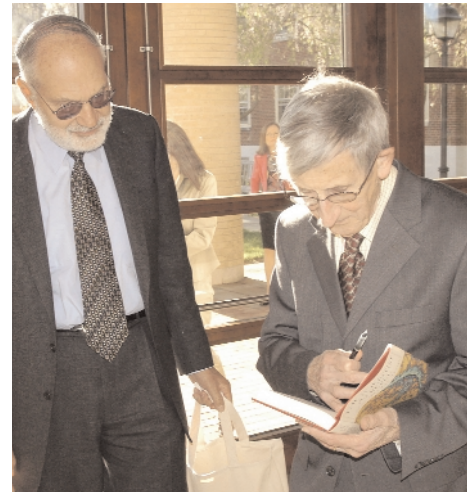
Tremaine also worked on a number of research projects. With his student Daniel Fabrycky, he addressed the curious observation that almost all close binary stars (those with orbital periods less than a few days) have distant companion stars. They argued that such systems began as much larger binaries, that oscillations in orbital eccentricity induced by the tidal field of the distant companion led to close encounters between the stars in the binary, and that tidal dissipation in these encounters then drained energy from the orbit, causing the binary to circularize and spiral inward. This mechanism may explain the formation of virtually all close binaries.

One of the surprising features of the 200 or so extrasolar planets that have been discovered in the past decade is their large orbital eccentricities, typically ten times those of planets in the solar system. With his former student Mario Juric, now a Member at the Institute, Tremaine demonstrated that the distribution of orbital eccentricities of extrasolar planets can be explained by an extended 100 Megayear period of slow dynamical evolution, lasting 1–2 orders of magnitude longer than the 1–10 Myr period in which the planets were formed. During this evolution, gravitational interactions between planets excite their eccentricities, leading in some cases to collisions or ejection. This result strengthens the growing evidence that our solar system is anomalous.

The most massive black holes in the universe are found at the centers of luminous galaxies. With members of the “Nuker” collaboration, Tremaine analyzed the likely properties of these objects. They argued that the most massive black holes are probably at least 10 billion times the mass of the sun but are found in relatively modest galaxies. These conclusions are consistent with the properties of the brightest quasars, which are believed to be fueled by accretion of gas onto massive black holes.

Tremaine also served as the Oort Professor at the University of Leiden and as the Raymond and Beverly Sackler Visiting Astrophysicist at the University of Toronto.

In 2006–07, Charles Simonyi Professor **Edward Witten** continued his work on applying gauge theory methods to understand the geometric Langlands program. With Sergei Gukov, he wrote a long and detailed paper on the “ramified” case of geometric Langlands. From a physical point of view, this entailed incorporating in  $\mathcal{N} = 4$  super Yang–Mills the-



CLIFF MOORE

Professor Emeritus Freeman Dyson (right; pictured with Martin Leibowitz, Vice Chairman of the Board of Trustees) spent most of the year on writing assignments, including his book, *The Scientist as Rebel* (New York Review Books, 2006), a collection of thirty-three of his previously published book reviews, essays, and speeches.

*The most massive black holes in the universe are found at the centers of luminous galaxies. With members of the “Nuker” collaboration, Professor Tremaine analyzed the likely properties of these objects. They argued that the most massive black holes are probably at least 10 billion times the mass of the sun but are found in relatively modest galaxies.*



ory a new class of “surface operators” as opposed to the more familiar “line operators” of Kenneth Wilson and Gerard ‘t Hooft. The ramified case of geometric Langlands arises from  $\mathcal{S}$ -duality or electric-magnetic duality applied to surface operators. Many novel results were obtained.

Witten has also been pursuing several other projects that go in roughly the same direction. A paper on the case of “wild ramification” is nearly complete. The main idea from a physical point of view is to incorporate “isomonodromic deformation” (previously shown by Michio Jimbo, Tetsuji Miwa, and Kimio Ueno to be important in two-dimensional integrable models such as the Ising model) in  $\mathcal{N} = 4$  super Yang–Mills theory. With Edward Frenkel, he is exploring some more detailed phenomena in this subject.

In addition, he has reconsidered an old interest—three-dimensional pure quantum gravity—with the aim of possibly finding a soluble model of black holes.

Professor Edward Witten (at the podium) continued his work on applying gauge theory methods to understand the geometric Langlands program, worked on several other projects that go in roughly the same direction, and pursued an old interest—three-dimensional pure quantum gravity—with the aim of possibly finding a soluble model of black holes.

Professor Emeritus **Freeman J. Dyson** spent most of the year on writing assignments. He finished two books for the general public, *The Scientist as Rebel*, published by the New York Review Books Collection in the fall of 2006, and *A Many-Colored Glass: Reflections on the Place of Life in the Universe*, to be published by the University of Virginia Press in the fall of 2007. He wrote a number of book reviews, and a preface for a new book, *Mathematics As Metaphor* by Yuri Manin. In the intervals between writing projects, he continued to struggle with the question of whether single gravitons are in principle observable. The question remains open.



RANDALL HAGADORN

## MEMBERS, VISITORS, AND RESEARCH STAFF

### Ofer Aharony

Particle Physics ♦ Weizmann Institute ♦ *f*

### Luis Fernando Alday

Particle Physics ♦ Utrecht University ♦ *s*

### Gabriela Alexe

Biology ♦ IBM Research ♦ *v*

### Gurinder Atwal

Biology ♦ Institute for Advanced Study

### Nils Baas

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Funding provided by the Friends of the Institute for Advanced Study

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### Satoshi Mishima

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### Michael Movshev

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Mathematical and Particle Physics ♦ CERN

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Mathematical and Particle Physics ♦ University of Tokyo

### Glenn van de Ven

Astrophysics ♦ Princeton University

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### Johannes Walcher

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### Erick Weinberg

Particle Physics ♦ Columbia University ♦ *s*

### Chen-Hsiang Yeang

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### Nadia Zakamska

Astrophysics ♦ Institute for Advanced Study

### Zheng Zheng

Astrophysics ♦ Institute for Advanced Study

*f* First Term ♦ *s* Second Term ♦  
*m* Long-term Member ♦ *v* Visitor ♦  
*jm* Joint Member School of Mathematics ♦  
*r* Research Fellow

## RECORD OF EVENTS

### Particle Physics Activities

#### September 15

High Energy Theory Seminar ♦ *On the CFT/AdS Correspondence* ♦ **Ofer Aharony**, Weizmann Institute; Member, School of Natural Sciences

#### September 25

High Energy Theory Seminar ♦ *Nucleation and  $zD$  Gravity* ♦ **Alexander Zamolodchikov**, Rutgers, The State University of New Jersey

#### September 28

Informal Phenomenology Seminar ♦ *Spin Measurements at the LHC* ♦ **Itay Yavin**, Princeton University

#### September 29

High Energy Theory Seminar ♦ *Unitary Realizations of U-duality Groups as Generalized Conformal and Quasiconformal Groups, Charge Orbits and Black Hole Attractors* ♦ **Murat Gunaydin**, Penn State University; Member, School of Natural Sciences

#### October 4

Physics Group Meeting ♦ *String Instantons and Quiver Gauge Theories* ♦ Informal Discussion

#### October 5

Informal Phenomenology Seminar ♦ *Cosmology and Collider Physics in the nMSSM* ♦ **Ayres Freitas**, Zurich University

#### October 6

High Energy Theory Seminar ♦ *The Holomorphic Anomaly Equation, Revisited and Extended* ♦ **Andrew Neitzke**, Member, School of Natural Sciences

#### October 12

Informal Phenomenology Seminar ♦ *An Inclusive Look at Charmless Inclusive B Decays* ♦ **Gil Paz**, Cornell University; Member, School of Natural Sciences

#### October 16

High Energy Theory Seminar ♦ *The Pentagon Model of TeV Scale Physics* ♦ **Tom Banks**, Rutgers, The State University of New Jersey

#### October 18

Physics Group Meeting ♦ *AdS/CFT, Euclidean Wormholes, and Cosmology* ♦ **Alexander Maloney**, Stanford University; Member, School of Natural Sciences

#### October 20–22

AXION Conference

#### October 23

High Energy Theory Seminar ♦ *Strongly Coupled Plasma Dynamics: Results from AdS/CFT* ♦ **Larry Yaffe**, University of Washington

#### October 25

Physics Group Meeting ♦ *Tivistor Space and Perturbative Gravity* ♦ **Niels Emil Jannik Bjerrum-Bohr**, University of Wales; Member, School of Natural Sciences

#### October 26

Informal Phenomenology Seminar ♦ *Seeing the Landscape* ♦ **Nima Arkani-Hamed**, Harvard University

#### October 27

High Energy Theory Seminar ♦ *Gravitational Limitations on a Global Description of Spacetimes with Horizons* ♦ **Nima Arkani-Hamed**, Harvard University

#### November 8

Physics Group Meeting ♦ *Informal Discussion: Suggested Reading—[hep-th/0610335](#) and [hep-th/0610299](#)* ♦ **Anirban Basu**, Member, School of Natural Sciences

#### November 9

Informal Phenomenology Seminar ♦ *The Gaugephobic Higgs* ♦ **Guido Marandella**, University of California, Davis

#### November 15

Physics Group Meeting ♦ *Stringy Instantons and Neutrino Masses* ♦ Informal Discussion

#### November 16

Special Physics Group Meeting ♦ *Moduli Stabilization in Nongeometric Phases* ♦ **Johannes Walcher**, Member, School of Natural Sciences

#### November 20

High Energy Theory Seminar ♦ *Experimental Implications of Warped Geometry* ♦ **Lisa Randall**, Harvard University

#### November 27

High Energy Theory Seminar ♦ *Aspects of Integrability in  $N = 4$  SYM* ♦ **Abhishek Agarwal**, City College of New York

#### November 29

Physics Group Meeting ♦ *Exact Classical Solutions Describing Closed String Tachyon Condensation* ♦ **Simeon Hellerman**, Long-term Member, School of Natural Sciences

#### November 30

Informal Phenomenology Seminar ♦ *Seeing the Landscape on Earth and in the Sky* ♦ **Philip Schuster**, Harvard University

#### December 1

High Energy Theory Seminar ♦ *A Character for BPS States of SCFT with Sasaki-Einstein Duals* ♦ **Dario Martelli**, CERN; Member, School of Natural Sciences

#### December 6

Physics Group Meeting ♦ *Stringy Instantons and Neutrino Masses II* ♦ Informal Discussion

#### December 11

High Energy Theory Seminar ♦ *Locality in Quantum Field Theory* ♦ **Graeme Segal**, Oxford University

#### December 15

High Energy Theory Seminar ♦ *Liouville Field, Modular Forms, and Elliptic Genera* ♦ **Tohru Eguchi**, Tokyo University; Member, School of Natural Sciences

#### January 17

Physics Group Meeting ♦ *Fun with AdS/CFT and Categories* ♦ **Aaron Bergman**, University of Texas

#### January 22

High Energy Theory Seminar ♦ *Geometrically Induced Metastability* ♦ **Cumrun Vafa**, Harvard University

#### January 24

Physics Group Meeting ♦ *Operator Product Expansion of 't Hooft Operators* ♦ **Edward Witten**, Charles Simonyi Professor, School of Natural Sciences

#### January 25

Informal Phenomenology Seminar ♦ *The New and Improved  $B \rightarrow X_s \gamma$ : Now at NNLO* ♦ **Thomas Becher**, Fermilab

#### January 31

Physics Group Meeting ♦ *Gauge Mediation of Metastable SUSY Breaking* ♦ Informal Discussion

#### February 5

High Energy Theory Seminar ♦ *The Arrow of Time, Black Holes, and Quantum Mixing of Large N Yang-Mills Theories* ♦ **Hong Liu**, Massachusetts Institute of Technology

#### February 7

Physics Group Meeting ♦ *Generalized Calibration and the Resolved Deformed Conifold* ♦ **Yuji Tachikawa**, University of Tokyo; Member, School of Natural Sciences

#### February 8

Informal Phenomenology Seminar ♦ *X and Y Gauge Mediation: Naturalness, Metastability and Squeezedness* ♦ **Hyung Do Kim**, Seoul National University



**February 9**

High Energy Theory Seminar ♦ *Exact Classical Solutions of Supercritical String Theory* ♦ **Simeon Hellerman**, Long-term Member, School of Natural Sciences

**February 12**

High Energy Theory Seminar ♦ *Children's Drawings from Seiberg-Witten Curves* ♦ **Eleonora Dell'Aquila**, Rutgers, The State University of New Jersey

**February 14**

Physics Group Meeting ♦ *Amplitudes from Recursion* ♦ **Niels Emil Jannik Bjerrum-Bohr**, University of Wales; Member, School of Natural Sciences

**February 16**

High Energy Theory Seminar ♦ *Curvature-Squared Term in 5d Supergravity and AdS/CFT* ♦ **Yuji Tachikawa**, University of Tokyo; Member, School of Natural Sciences

**February 21**

Physics Group Meeting ♦ *Black Hole Attractors and Marginal Stability* ♦ **Alexander Maloney**, Stanford University; Member, School of Natural Sciences

**February 22**

Informal Phenomenology Seminar ♦ *Metastability* ♦ **Michael Dine**, University of California, Santa Cruz; Member, School of Natural Sciences

**February 28**

Physics Group Meeting ♦ *Leptogenesis* ♦ **Yossi Nir**, Weizmann Institute

**March 2**

High Energy Theory Seminar ♦ *How Well Can We Hope to Know  $b \rightarrow s \gamma$ ?* ♦ **Gil Paz**, Cornell University; Member, School of Natural Sciences

**March 5**

High Energy Physics Seminar ♦ *Metastable Vacua in Supersymmetric Gauge Theories* ♦ **Hiroshi Ooguri**, California Institute of Technology

**March 8**

Informal Phenomenology Seminar ♦ *Jets Initiated by Massive Unstable Particles: Top-Mass Determination* ♦ **Iain Stewart**, Massachusetts Institute of Technology

**March 16**

High Energy Theory Seminar ♦ *Deformations of Maximally Supersymmetric Yang-Mills Theories and Pure Spinors* ♦ **Michael Movshev**, Joint Member, School of Natural Sciences and School of Mathematics

**March 19**

High Energy Theory Seminar ♦ *Three-Loop Superfiniteness of  $N = 8$  Supergravity* ♦ **Zvi Bern**, University of California, Los Angeles

**March 26**

High Energy Theory Seminar ♦ *New Dimensions from Wound Strings* ♦ **John McGreevy**, Massachusetts Institute of Technology

**March 28**

Physics Group Meeting ♦ *Moduli Stabilization in Nongeometric Backgrounds* ♦ **Katrin Becker**, Texas A & M University

**March 29**

Informal Phenomenology Seminar ♦ *Light, Dark Matter, and Higgses* ♦ **Bob McElrath**, University of California, Davis

**April 4**

Physics Group Meeting ♦ *String Theory Embeddings of the ISS Model* ♦ Informal Discussion

**April 9**

High Energy Theory Seminar ♦ *Dynamical Symmetry Breaking from Intersecting Branes* ♦ **David Kutasov**, University of Chicago

**April 12**

Physics Group Meeting ♦ *Pure Spinors and  $AdS_5 \times S^5$*  ♦ **Nathan Berkovits**, Universidade Estadual Paulista, Brazil

**April 20**

High Energy Theory Seminar ♦ *Scaling Dimension of High Spin Operators at Strong Coupling* ♦ **Luis Fernando Alday**, Utrecht University; Member, School of Natural Sciences

**April 23**

High Energy Theory Seminar ♦ *Progress on the Geometry of Supersymmetric String Vacua* ♦ **Alessandro Tomasiello**, Stanford University

**April 25**

High Energy Theory Special Seminar ♦ *The S-Matrix of AdS/CFT* ♦ **Niklas Beisert**, Max Planck Institute for Gravitational Physics

**April 26**

Informal Phenomenology Seminar ♦ *The Real World  $\eta$  Prime from AdS* ♦ **Matthew Schwartz**, Johns Hopkins University

**May 2**

Physics Group Meeting ♦ Informal Discussion

**May 3**

Informal Phenomenology Seminar ♦ *The WZW Term and the Higgs Boson* ♦ **Richard Hill**, Fermilab

**May 7**

High Energy Theory Seminar ♦ *Vacuum Transitions in Curved Spacetime: Understanding Coleman-De Luccia Tunneling* ♦ **Erick Weinberg**, Columbia University; Member, School of Natural Sciences

**May 10**

Informal Phenomenology Seminar ♦ *Neutrino Mass and the Baryon Asymmetry* ♦ **Boris Kayser**, Fermilab

**May 14**

High Energy Theory Seminar ♦ *Derivation of the Quantum Formalism from a Simple Principle* ♦ **Simon Kochen**, Princeton University

**May 15**

High Energy Theory Special Seminar ♦ *Skymions and Nuclei* ♦ **Nick Manton**, Cambridge University

**May 15**

Special Physics Seminar ♦ *Warm-up for Solving Noncompact Sigma-Models: The Sinh-Gordon Model* ♦ **Joerg Teschner**, Deutsches Elektronen-Synchrotron

**May 17**

Informal Phenomenology Seminar ♦ *Higgsless Electroweak Symmetry Breaking* ♦ **Csaba Csaki**, Cornell University

**May 18**

High Energy Theory Seminar ♦ *Metastable SUSY Breaking in a Cooling Universe* ♦ **Vadim Kaplunovsky**, University of Texas at Austin

**May 23**

Physics Group Meeting ♦ Informal Discussion

**May 24**

Informal Phenomenology Seminar ♦ *Collapse Models: Present Status and Future Perspectives* ♦ **Angelo Bassi**, University of Trieste

**May 30**

Physics Group Meeting ♦ *Tree and Loop Amplitudes in Open Tivistor String Theory* ♦ **Louise Dolan**, University of North Carolina

**June 4**

Special Phenomenology Seminar ♦ *Understanding the Forward Muon Deficit in Inelastic Neutrino Interactions* ♦ **Lalit Sehgal**, Institute of Theoretical Physics, RWTH

**Astrophysics Activities****September 19**

Astrophysics Seminar ♦ *Dark Energy, Dark Matter, and Axions: A Random Walk* ♦ **Edward Witten**, Charles Simonyi Professor, School of Natural Sciences

### September 26

Astrophysics Seminar ♦ *Mass Loss in Stars Near the Eddington Limit* ♦ **Stan Owocki**, Bartol Research Institute, University of Delaware

### September 27

Astrophysics Informal Seminar ♦ *Magnetic Channeling of Stellar Winds* ♦ **Stan Owocki**, Bartol Research Institute, University of Delaware

### October 3

Astrophysics Seminar ♦ *Halo Occupations and Large-Scale Structure: Five Years Later* ♦ **David Weinberg**, The Ohio State University; Visitor, School of Natural Sciences

### October 10

Astrophysics Seminar ♦ *The Search for Those Elusive Gravitational Waves: Giant Detectors, Precision Measurement, and Astrophysical Searches* ♦ **Nergis Mavalvala**, Massachusetts Institute of Technology

### October 11

Astrophysics Informal Seminar ♦ *Adventures in Relativistic MHD Applied to Compact Objects* ♦ **Jon McKinney**, Harvard-Smithsonian Center for Astrophysics

### October 17

Astrophysics Seminar ♦ *Galactic Winds: What Sodium Can Tell Us* ♦ **Norm Murray**, Canadian Institute for Theoretical Astrophysics

### October 18

Astrophysics Informal Seminar ♦ *Magnetic Reconnection (part of the Theoretical Astrophysics Discussion Series)* ♦ **Dmitry Uzdensky**, Princeton University

### October 24

Astrophysics Seminar ♦ *Towards a Physical Theory of Accretion onto Black Holes* ♦ **Julian Krolik**, Johns Hopkins University

### October 25

Astrophysics Informal Seminar ♦ *The Motions of the Magellanic Clouds about the Milky Way: Towards a Reassessment of Some Fundamental Questions* ♦ **Nitya Kallivayalil**, Harvard-Smithsonian Center for Astrophysics

### October 31

Astrophysics Seminar ♦ *Where Has All the Deuterium Gone?* ♦ **Bruce Draine**, Princeton University

### November 7

Astrophysics Seminar ♦ *How Bright Are Submillimetre Galaxies?* ♦ **Douglas Scott**, University of British Columbia

### November 8

Astrophysics Informal Seminar ♦ *GRBs: Recent Developments and Applications to Galaxy and IGM Studies* ♦ **Edo Berger**, Carnegie Observatories

### November 14

Astrophysics Seminar ♦ *SN1987A: The Birth of a Supernova Remnant* ♦ **Dick McCray**, University of Colorado

### November 15

Astrophysics Informal Seminar ♦ *Formation and Evolution of Disk Galaxies From  $z \sim 1$  to Now: Constraints from New Observations* ♦ **Susan Kassin**, University of California Observatories, Lick Observatories

### November 21

Astrophysics Seminar ♦ *The Space Interferometer Mission: Parallaxes, Planets, and More* ♦ **Shri Kulkarni**, California Institute of Technology

### November 22

Astrophysics Informal Seminar ♦ *Illuminating the Universe: New Probes of Reionization and Cosmology* ♦ **Oliver Zahn**, Harvard-Smithsonian Center for Astrophysics

### November 28

Astrophysics Seminar ♦ *Star Formation Taste Tests* ♦ **Alyssa Goodman**, Harvard-Smithsonian Center for Astrophysics

### December 4

Astrophysics Informal Seminar ♦ *The 21-cm Signal from the Epoch of Reionization* ♦ **Leonid Chuzhoy**, University of Texas, Austin; Visitor, School of Natural Sciences

### December 5

Astrophysics Seminar ♦ *The Importance of Lens Environments* ♦ **Ann Zabludoff**, Steward Observatory, University of Arizona

### December 7

Astrophysics Informal Seminar ♦ *Analysis of GRB Prompt Emission* ♦ **Asaf Pe'er**, University of Amsterdam

### December 11

Astrophysics Informal Seminar ♦ *SNR 1987A & Balmer-dominated Supernova Remnants* ♦ **Kevin Heng**, JILA, University of Colorado and the National Institute of Standards and Technology

### January 16

Astrophysics Informal Seminar ♦ *Titan's Tropical Weather and Climate* ♦ **Jonathan Mitchell**, University of Chicago

### January 18

Astrophysics Informal Seminar ♦ *The Influence of Baryons and Dissipation on the Matter Power Spectrum* ♦ **Douglas Rudd**, University of Chicago

### January 25

Astrophysics Informal Seminar ♦ *Dynamical Structure of Early-type Stellar Systems Unraveled with Line-of-sight and Proper Motion Kinematics* ♦ **Glenn van de Ven**, Princeton University; Member, School of Natural Sciences

### February 6

Astrophysics Seminar ♦ *Debris Disks and Planets, and the Study of the Dust in the HD 38529 Two-Planet System* ♦ **Amaya Moro-Martin**, Princeton University

### February 13

Astrophysics Seminar ♦ *Collisional Disks Truncated by Planets and Resonance Capture* ♦ **Alice Quillen**, University of Rochester

### February 20

Astrophysics Seminar ♦ *Binary Black Holes, Gravitational Waves, and Numerical Relativity* ♦ **Joan Centrella**, NASA/Goddard Space Flight Center

### February 27

Astrophysics Seminar ♦ *Finding Black Hole Pairs in the Sky* ♦ **Kristen Menou**, Columbia University

### March 1

Astrophysics Informal Seminar ♦ *Peeking into a Neutron Star: Neutrons, Condensates, or Quarks?* ♦ **Feryal Özel**, University of Arizona

### March 6

Astrophysics Seminar ♦ *Intermediate-Mass Black Holes and Gravitational Radiation* ♦ **Coleman Miller**, University of Maryland

### March 13

Astrophysics Seminar ♦ *The First Supermassive Black Holes?* ♦ **Mitch Begelman**, JILA, University of Colorado and the National Institute of Standards and Technology

### March 20

Astrophysics Seminar ♦ *Secular Dynamics of Planets and Disks* ♦ **Gordon Ogilvie**, Cambridge University

### March 27

Astrophysics Seminar ♦ *The Formation of the First Stars* ♦ **Christopher McKee**, University of California, Berkeley

### April 3

Astrophysics Seminar ♦ *MAGPIS: Finding Magnetars, Dark Accelerators, and Other Shiny Trinkets in a Galactic Plane Radio Survey* ♦ **David Helfand**, Columbia University

### April 10

Astrophysics Seminar ♦ *Precision Bothrology: Toward a Physical Theory of Sgr A\** ♦ **Charles Gammie**, University of Illinois; Member, School of Natural Sciences

**April 12**

Astrophysics Informal Seminar ♦ *How Inclination Angle Affects Electrodynamics and Statistics of Radio Pulsars* ♦ **Vasily Beskin**, Lebedev Physical Institute, Moscow

**April 19**

Astrophysics Informal Seminar ♦ *The New Moons around Pluto-Charon: Implications for the Kuiper Belt* ♦ **Yanqin Wu**, University of Toronto

**April 23**

Astrophysics Informal Seminar ♦ *The Puzzling Spectra of Thermally Emitting Isolated Neutron Stars* ♦ **Marten van Kerkwijk**, University of Toronto

**April 24**

Astrophysics Seminar ♦ *AGN Outflows and Galaxy Cluster Evolution* ♦ **David DeYoung**, National Optical Astronomy Observatory (NOAO)

**April 26**

Astrophysics Informal Seminar ♦ *A Different Look at Type Ia Supernovae* ♦ **Carles Badenes**, Rutgers, The State University of New Jersey

**May 1**

Astrophysics Seminar ♦ *The Clustering and Physical Properties of High-Redshift Quasars* ♦ **Michael Strauss**, Princeton University

**May 3**

Astrophysics Informal Seminar ♦ *TeV Gamma Rays from Shell Type SNRs* ♦ **Boaz Katz**, Weizmann Institute of Science

**May 8**

Astrophysics Seminar ♦ *Collisionless Shocks, Magnetic Fields, and High Energy Particles: Some Open Questions* ♦ **Eli Waxman**, Weizmann Institute of Science; Visitor, School of Natural Sciences

**June 19**

Astrophysics Talk ♦ *Tracing Tidal Streams in the Galactic Halo* ♦ **David Martínez-Delgado**, Instituto de Astrofísica de Canarias

## The Simons Center for Systems Biology Activities

**July 10**

The Simons Center for Systems Biology Group Meeting

**July 18**

The Simons Center for Systems Biology Seminar ♦ *BioComputing @ Biopolis—Opening New Frontiers at the Interface of Computing, Biology, and Medicine* ♦ **Gunaretnam Rajagopal**, Bioinformatics Institute, Singapore

**July 21**

The Simons Center for Systems Biology Seminar ♦ *Very Many Samples May Be Needed to Obtain Robust Results in Microarray Experiments* ♦ **Or Zuk**, Weizmann Institute of Science

**July 28**

Tri-Lab Meeting hosted by The Simons Center for Systems Biology ♦ *Autophagy in Cancer and Other Aging Diseases: An Overview* ♦ **Shengkan Jin**, University of Medicine and Dentistry of New Jersey-Robert Wood Johnson Medical School ♦ *Autophagy, Mitochondria Degradation, and Mitochondrial Functions* ♦ **Yong Zhang**, University of Medicine and Dentistry of New Jersey-Robert Wood Johnson Medical School ♦ *Autophagy in Metabolic Stress and Genome Instability* ♦ **Haiyan Zhang**, University of Medicine and Dentistry of New Jersey-Robert Wood Johnson Medical School ♦ *Screen for Aging-related Tumor Suppressor Genes* ♦ **Robert Taylor**, University of Medicine and Dentistry of New Jersey-Robert Wood Johnson Medical School ♦ *Caffeine Regulates Alternative Splicing of a Subset of Cancer-related Genes* ♦ **Jia Shi**, The Cancer Institute of New Jersey; University of Medicine and Dentistry of New Jersey-Robert Wood Johnson Medical School ♦ *p53 Overview* ♦ **Arnold Levine**, Professor, The Simons Center for Systems Biology, School of Natural Sciences ♦ *p53 Regulation of LIF* ♦ **Wenwei Hu**, The Cancer Institute of New Jersey; University of Medicine and Dentistry of New Jersey-Robert Wood Johnson Medical School ♦ *The p53- IGF-1-mTOR Connections* ♦ **Zhaohui Feng**, The Cancer Institute of New Jersey; University of Medicine and Dentistry of New Jersey-Robert Wood Johnson Medical School ♦ *SNPs-Perp* ♦ **Kim Hirshfield**, The Cancer Institute of New Jersey; University of Medicine and Dentistry of New Jersey-Robert Wood Johnson Medical School ♦ *The p53- Regulated Exosome Production Pathway* ♦ **Xin Yu**, The Cancer Institute of New Jersey; University of Medicine and Dentistry of New Jersey-Robert Wood Johnson Medical School ♦ *Haplotypes from the MDM2 Gene* ♦ **Gurinder Atwal**, The Simons Center for Systems Biology, School of Natural Sciences

**August 8**

The Simons Center for Systems Biology Seminar ♦ *How Neural Activity Changes the Strengths of Connections in the Brain* ♦ **Gayle Wittenberg**, Princeton University

**September 5**

The Simons Center for Systems Biology Seminar ♦ *Mitochondrial Haplogroups Associated with Susceptibility to or Resistance against Metabolic Syndrome and Type 2 Diabetes* ♦ **Masashi Tanaka**, Tokyo Metropolitan Institute of Gerontology

**September 8**

The Simons Center for Systems Biology Seminar ♦ *Nuclear Cloning, Embryonic Stem Cells and Cell Therapy: Promise, Problems, Reality* ♦ **Rudolf Jaenisch**, Whitehead Institute

**September 22**

The Simons Center for Systems Biology Group Meeting

**September 29**

The Simons Center for Systems Biology Group Meeting

**October 4–5**

Virology Symposium hosted by The Simons Center for Systems Biology ♦ *Host Factors Involved in Retrovirus Replication: Trafficking In and Out* ♦ **Stephen P. Goff**, Columbia University, College of Physicians and Surgeons ♦ *Array-based New Viral Pathogen Discovery: Integrating Genomic Technology and Clinical Reasoning* ♦ **Don Ganem**, HHMI/University of California, San Francisco ♦ *Mechanistic Insights into the Role of Papillomaviruses in Carcinogenesis* ♦ **Peter M. Howley**, Harvard Medical School ♦ *Influenza Pandemics: Past and Future* ♦ **Peter Palese**, Mount Sinai School of Medicine ♦ *Host Dependent Mutational Bias and Reassortment in Influenza A Virus* ♦ **Raúl Rabadán**, The Simons Center for Systems Biology, School of Natural Sciences ♦ *The Plasmid Replicon of Epstein-Barr Virus: A Paradigm for Mammalian DNA Replication* ♦ **William M. Sugden**, University of Wisconsin-Madison, School of Medicine and Public Health ♦ *Human Cytomegalovirus Latency* ♦ **Thomas E. Shenk**, Princeton University ♦ *Type 1 Interferons in Shaping Immunity to Viral Infections* ♦ **Christine A. Biron**, Brown University ♦ *Retroviral Recombination: Always Happening* ♦ **Joseph P. Dougherty**, University of Medicine and Dentistry of New Jersey-Robert Wood Johnson Medical School ♦ *Prions of Yeast Are In-register Parallel Beta Sheet Amyloids* ♦ **Reed B. Wickner**, National Institutes of Health

**October 6**

The Simons Center for Systems Biology Group Meeting

The Simons Center for Systems Biology Seminar ♦ *The Recruitment of DNA Trans-lesion Synthesis Polymerase kappa in Response to DNA Damage* ♦ **Xiaohui (Emma) Bi**

**October 10**

The Simons Center for Systems Biology/Merck Research Laboratories Joint Research Meeting on HIV Vaccines



#### October 20

The Simons Center for Systems Biology Seminar ♦ *Evolutionary Principles Underlying Protein Folding and Function* ♦ **Rama Ranganathan**, University of Texas Southwestern Medical Center at Dallas

#### October 23

The Simons Center for Systems Biology Group Meeting

#### October 27

The Simons Center for Systems Biology Seminar ♦ *The Identification and Evolution of Processing Signals* ♦ **William Fairbrother**, Brown University

#### October 30

The Simons Center for Systems Biology Seminar ♦ *Human-Chimpanzee Speciation* ♦ **Nick Patterson**, Broad Institute of MIT and Harvard

#### November 13

The Simons Center for Systems Biology Seminar ♦ *A Systems Approach to Protein Kinase Signaling Networks* ♦ **Michael B. Yaffe**, Massachusetts Institute of Technology

#### November 14

The Simons Center for Systems Biology Group Meeting

The Simons Center for Systems Biology Seminar ♦ *Identification and Characterization of Novel Compounds with Anti-Cancer Activity* ♦ **Senthil K. Radhakrishnan**, University of Illinois at Chicago

#### November 15

The Simons Center for Systems Biology Group Meeting

#### November 20

The Simons Center for Systems Biology/Center for Advanced Biotechnology and Medicine Joint Research Meeting on Autism

The Simons Center for Systems Biology Seminar ♦ *Interpreting the Human Genome* ♦ **Manolis Kellis**, Massachusetts Institute of Technology and Broad Institute of MIT and Harvard

#### December 21

The Simons Center for Systems Biology Group Meeting

#### January 8

The Simons Center for Systems Biology Group Meeting

#### January 19

The Simons Center for Systems Biology Group Meeting

#### January 23

The Simons Center for Systems Biology Seminar ♦ *The Effects of Immune Selection on the Population Dynamics of Pathogens* ♦ **Sunetra Gupta**, University of Oxford

#### January 24

The Simons Center for Systems Biology Seminar ♦ *The Identification and Analysis of Single Nucleotide Polymorphisms in the p53 Stress Response Pathway That Affect Cancer in Humans* ♦ **Gareth Bond**, The Simons Center for Systems Biology, School of Natural Sciences

#### February 7

The Simons Center for Systems Biology Seminar ♦ *Detangling Scrambled Genes and Genomes* ♦ **Laura Landweber**, Princeton University

#### February 9

The Simons Center for Systems Biology Group Meeting

The Simons Center for Systems Biology Seminar ♦ *Underneath a Virus Capsid: Electrostatics of the Genome Binding* ♦ **Vladimir Belyi**, University of Massachusetts

#### February 22

The Simons Center for Systems Biology Seminar ♦ *Mapping the Chromatin Structure of Human Promoters* ♦ **Jun Song**, Dana-Farber Cancer Institute and Harvard School of Public Health

#### March 1

The Simons Center for Systems Biology Group Meeting

#### March 2

The Simons Center for Systems Biology/Bristol-Myers Squibb Oncology Joint Research Meeting on Cancer

#### March 5

The Simons Center for Systems Biology Group Meeting

#### March 6

The Simons Center for Systems Biology Seminar ♦ *Deregulation of Signal Transduction Pathways by the Latent Viral Oncoproteins of Kaposi's Sarcoma Herpesvirus (KSHV/HHV-8)* ♦ **Darya Bubman**, Weill Medical College of Cornell University

#### March 7

The Simons Center for Systems Biology Group Meeting

#### March 9

The Simons Center for Systems Biology Group Meeting

The Simons Center for Systems Biology Seminar ♦ *Modeling Human Dynamics* ♦ **João Gama Oliveira**, University of Aveiro and University of Notre Dame, Indiana

#### March 12

The Simons Center for Systems Biology Group Meeting

#### March 15

The Simons Center for Systems Biology Group Meeting

#### March 27

The Simons Center for Systems Biology Seminar ♦ *Natural Scene Statistics and the Organization of the Retina* ♦ **Vijay Balasubramanian**, University of Pennsylvania

#### April 2

The Simons Center for Systems Biology Group Meeting

#### April 3

The Simons Center for Systems Biology Seminar ♦ *Axin: A Scaffold Protein Differentially Controls Cell Signaling and Development* ♦ **Yanning Rui**, Hong Kong University of Science & Technology

#### April 6

The Simons Center for Systems Biology Seminar ♦ *Protein Phosphatase 2A: New Insights into an Old Paradigm* ♦ **Yigong Shi**, Princeton University

#### April 9

The Simons Center for Systems Biology Seminar ♦ *Recurrent DNA Copy Number Variation in the Laboratory Mouse* ♦ **Ira M. Hall**, Cold Spring Harbor Laboratory

#### April 11 – 12

The Simons Center for Systems Biology Symposium ♦ *Origins of Life: Adapting to the Environment*

I. Finding Extrasolar Planets ♦ *Other Worlds and Other Life* ♦ **Edwin L. Turner**, Princeton University

II. Europa, Mars, Titan ♦ *Life and Clues to its Origin: What Titan, Europa, Mars, and Enceladus Can Tell Us* ♦ **Ralph D. Lorenz**, Johns Hopkins Applied Physics Lab

III. Origins of Life ♦ *Chemistry and Selection in the Origin of Life* ♦ **Christian de Duve**, Institute of Cellular Pathology ♦ *What Is the Problem We Are Trying to Solve?* ♦ **George M. Whitesides**, Harvard University

IV. Earth Geology ♦ *Radiolytically Sustained Deep Subsurface Microbial Ecosystems: Implications for Life Beneath the Surface of Mars* ♦ **Tullis Onstott**, Princeton University

V. RNA World ♦ *The Origin of Life and the Emergence of Darwinian Evolution* ♦ **Jack W. Szostak**, HHMI/Massachusetts General Hospital

VI. Extremophiles ♦ *Hyperthermophiles: An Early Adaptation of Life?* ♦ **Karl O. Stetter**, Universität Regensburg ♦ *Microbial Life in Ice and Implications for a Cold Origin of Life* ♦ **P. Buford Price**, University of California, Berkeley ♦ *Evolution of Robustness: Deinococcus Radiodurans* ♦ **Miroslav Radman**, Université de Paris-Descartes

VII. Minimal Genome Concepts ♦ *Defining a Minimal Cellular Genome: The Prospect of Synthetic Life* ♦ **Clyde A. Hutchison III**, J. Craig Venter Institute

VIII. Worldwide Genes and Genomes ♦ *From Genomics to Metagenomics: Exploring Microbial Diversity and Expanding the Protein Family Universe* ♦ **Shibu Yooseph**, J. Craig Venter Institute ♦ *Microbial Community Genomics: New Perspectives on Ecology, Evolution, and Environmental Process* ♦ **Edward F. Delong**, Massachusetts Institute of Technology

#### April 23

The Simons Center for Systems Biology Seminar ♦ *Novel Regulatory Mechanisms Based on DNA Duplex Destabilization* ♦ **Prashanth A.K.**, University of California, Santa Barbara

#### May 9

The Simons Center for Systems Biology Seminar ♦ *BioMEMS and Symbolic Regression for Automated Inference of Metabolic Network Dynamics* ♦ **John P. Wikswo**, Vanderbilt University

#### May 10

The Simons Center for Systems Biology/Dabur Research Foundation Joint Research Meeting on Cancer

#### May 11

The Simons Center for Systems Biology Seminar ♦ *Revealing Posttranscriptional Regulatory Elements in Eukaryotes* ♦ **Chang S. Chan**, Princeton University

#### June 6

The Governor's Conference on Effective Partnering in Cancer Research ♦ *Genomics: Perspectives on Cancer Prevention*

Welcoming Remarks, **Edmund C. Lattime**, The Cancer Institute of New Jersey ♦ **Joseph R. Bertino**, Interim Director, The Cancer Institute of New Jersey ♦ **Fred M. Jacobs**, Commissioner, New Jersey Department of Health and Senior Services

I. Genomics and Cancer Risk Roundtable ♦ **Joseph R. Bertino**, The Cancer Institute of New Jersey (Moderator) ♦ **David A. August**, The Cancer Institute of New Jersey ♦ **Susan**

**Sklower Brooks**, Robert Wood Johnson Medical School ♦ **Judy Garber**, Dana-Farber Cancer Institute, Harvard Medical School ♦ **Paul S. Miller**, University of Washington ♦ **Kimberly Ranieri**, The Cancer Institute of New Jersey ♦ **Timothy Rebbeck**, University of Pennsylvania, School of Medicine ♦ **Deborah Toppmeyer**, The Cancer Institute of New Jersey ♦ **Kangpu Xu**, Weill Cornell Medical College

II. The New Genomics: Identification of Risk ♦ **Arnold J. Levine**, The Simons Center for Systems Biology, School of Natural Sciences (Moderator) ♦ *Polymorphisms in the p53 Pathway and Predisposition to Cancer* ♦ **Arnold J. Levine**, The Simons Center for Systems Biology, School of Natural Sciences ♦ *Prediction and Modification of Cancer Risk in BRCA1 Mutation Carriers* ♦ **Timothy Rebbeck**, University of Pennsylvania, School of Medicine ♦ *Molecular Profiling Diagnostics to Guide Treatment for Breast Cancer* ♦ **Laura Van't Veer**, Netherlands Cancer Institute

III. Implementation Strategies in Response to Risk ♦ **James Broach**, Princeton University (Moderator) ♦ *Vaccines for Viral-induced Cancers* ♦ **Adel Mahmoud**, Woodrow Wilson School, Princeton University ♦ *Recent Advances in Pre-implantation Genetic Diagnosis for Cancer Susceptibility Syndromes* ♦ **Kangpu Xu**, Weill Cornell Medical College ♦ *Breast Cancer Genetics: Clues to Tumor Biology* ♦ **Judy Garber**, Dana-Farber Cancer Institute, Harvard Medical School

IV. A Discussion of the Ethics of Intervention in Response to Gene-based Risk ♦ **Daniel Notterman**, Robert Wood Johnson Medical School (Moderator) ♦ **Lee M. Silver**, Princeton University ♦ **Paul S. Miller**, University of Washington

#### June 13

The Simons Center for Systems Biology Seminar ♦ *Assembling a Human B Cell Interactome for the Dissection of Dysregulated Pathways in Lymphoid Malignancies* ♦ **Andrea Califano**, Columbia University

#### June 22

The Simons Center for Systems Biology Seminar ♦ *Spatiotemporal Coordination of Inductive Signals in Tissue Patterning* ♦ **Stanislav Shvartsman**, Princeton University

#### June 25

The Simons Center for Systems Biology Seminar ♦ *Avian Influenza and Pandemic Disease* ♦ **Leo Poon**, The University of Hong Kong

# Prospects in Theoretical Physics

Prospects in Theoretical Physics (PiTP) is an intensive two-week summer program geared specifically to graduate students and postdoctoral scholars considering a career in theoretical physics. First held at the Institute for Advanced Study in 2002, PiTP has, in past years, covered topics ranging from the Large Hadron Collider (LHC) to string theory.

The program builds on the strong relationship between the research groups at the Institute and Princeton University. Representatives from both institutions are among the program's organizers and lecturers. PiTP encourages the participation of women, minorities, and students from institutions that do not have extensive programs in theoretical physics or access to research universities.

The 2007 PiTP program was held from July 16–27 at the Institute. The theme of the 2007 program was “The Standard Model and Beyond.” It focused on particle physics phenomenology with special emphasis on model building. The goal of the program was to prepare young physicists for the physics that will emerge from the LHC, scheduled to release the first data in 2008.

Over 120 individuals were officially enrolled in the program, with a majority of the visiting students living in the Institute's housing complex during the program. Moreover, the program lectures attracted many students, postdoctorates, and professors from nearby institutions.

The Prospects in Theoretical Physics program is under the direction of Professor **Chiara R. Nappi**, a Princeton University physics professor, and she is assisted by a local organizing committee of area physicists. This year's organizers and program directors were **Michael Dine** of the University of California at Santa Cruz and **Nathan Seiberg** of the Institute for Advanced Study.

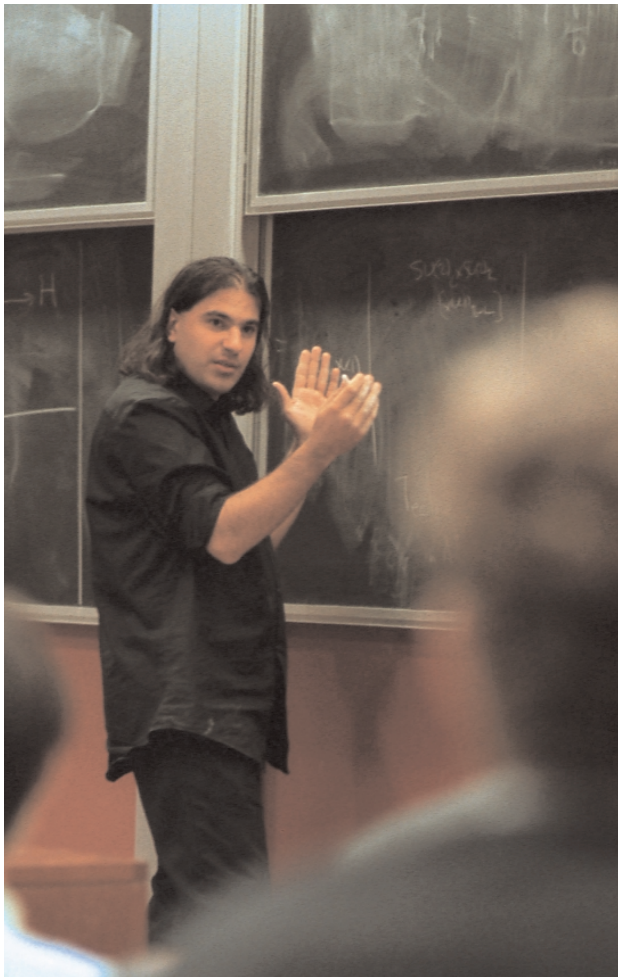
In addition to the organizers, Lecturers included: **Nima Arkani-Hamed** (Harvard University); **Stephen D. Ellis** (University of Washington); **Igor Klebanov** (Princeton University); **Paul Langacker** (Institute for Advanced Study); **Markus A. Luty** (University of Maryland); **Juan Maldacena** (Institute for Advanced Study); **Aneesh V. Manohar** (University of California, San Diego); **Konstantin Matchev** (University of Florida); **Yosef Nir** (Weizmann Institute of Science); **Michael E. Peskin** (SLAC, Stanford University); **Scott Thomas** (Rutgers, The State University of New Jersey); and **Edward Witten** (Institute for Advanced Study).

Prospects in Theoretical Physics 2007 was supported by The Concordia Foundation.

The 2007 Prospects in Theoretical Physics (PiTP) program focused on particle physics phenomenology with special emphasis on model building. The goal of the program was to prepare young physicists for the physics that will emerge from the Large Hadron Collider, scheduled to release the first data in 2008.













# The School of Social Science

## Faculty

**Eric S. Maskin**, Albert O. Hirschman Professor

**Joan Wallach Scott**, Harold F. Linder Professor

**Michael Walzer**, UPS Foundation Professor

## Professors Emeriti

**Clifford Geertz** (*deceased 10-30-2006*)

**Albert O. Hirschman**

## ACADEMIC ACTIVITIES

The School of Social Science invited twenty scholars from a pool of 186 applicants from the United States and abroad to be part of the School's scholarly community as Members for the 2006–07 academic year. Nine visitors and two research assistants also participated in the year's activities. The National Endowment for the Humanities partially or fully funded three Members. Economists were supported by grants from the Leon Levy Foundation and Institute Trustee Roger Ferguson, as well as the Richard B. Fisher and the Deutsche Bank Memberships. Fields of inquiry of the group included political science (8), economics (6), anthropology (5), philosophy (3), history (2), psychology (2), literature (2), sociology (2), and geography (1).

The thematic focus for 2006–07 was “The ‘Third World’ Now.” The last sixty years have seen a dramatic change in the shape of the world. Colonial empires have dissolved either violently or peacefully and a new international system has taken shape. From the original forty-two members of the League of Nations, the United Nations has grown to 191. In many states founded by charismatic spokesmen for national liberation, there is now a second generation of more managerial types. And there is a different, volatile configuration of alliances and antagonisms among them. There have been many studies over the years of such matters as the modernization and development of emerging economies, postcolonial culture and politics, ethnic rivalries within and among nations, and post–Cold War realignments. Most such studies have been conducted within the context of “globalization,” and have used categories of analysis that, in the light of recent history, appear dated and inadequate to the task. What is lacking, and what we are hoping to provide, is a map of structure, and form. Such a map requires not only empirical work (from historians, ethnographers, political economists, geographers, sociologists), but new and revised categories of analysis that will illuminate the patterns that have emerged. The thematic year was designed to bring together a group of scholars from all over the world whose individual work (substantive and focused as well as theoretical) would contribute to the drawing of this map and who collectively would articulate the analytic categories that can make sense of the “third world” as it is now.

The School conducted three seminar series: the Social Science Thursday Luncheon Seminar, “The ‘Third World’ Now” Thematic Seminar, and the IAS/Princeton University Economics Workshop. The School continued publication of its series of *Occasional Papers* and *Economics Working Papers*, which can be accessed via the Institute's website.

In October, the School mourned the passing of its founding professor, noted anthropologist and Professor Emeritus Clifford Geertz; in March, over 200 people attended a memorial event for him at the Institute.



*The thematic focus for 2006–07 was “The ‘Third World’ Now.” The last sixty years have seen a dramatic change in the shape of the world.*

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Professor Eric Maskin (left) attended a Thursday Luncheon Seminar where Member Yitzhak Benbaji (center) spoke about “War, Responsibility, and the Moral Equality of Soldiers.” Professor Michael Walzer (right) gave a Faculty lecture, “Terrorism and Just War,” at the Institute in May.



On a happier note, the School appointed Danielle S. Allen as the UPS Foundation Professor, effective July 1, 2007, upon the retirement of Michael Walzer. Trained both as a classicist and a political theorist, Dr. Allen comes to us from the University of Chicago, where she has been Dean of the Humanities Division, and where she has served on the faculty since 1997.

In July 2006, Albert O. Hirshman Professor **Eric S. Maskin** gave a plenary address on patent protection and innovation at the Far East Asian meeting of the Econometric Society, Beijing. This was also the subject of lectures at Cheung Kong Graduate School of Business, Beijing, the European Patent Office in Munich, the Free University of Brussels, the University of Madras, the Academia Sinica in Taiwan, and the Hong Kong University of Science and Technology. In July as well, he gave the Arrow Lecture on “Recent Developments in Mechanism Design” at the Eighth International Meeting of the Society for Social Choice and Welfare in Istanbul. This was also the subject of his Jacob Marschak Lecture at the Southeast Asian Meeting of the Econometric Society in Chennai and lectures at Jiaotong University, Shanghai, a conference in honor of James Mirrlees at Cambridge University, Central University in Beijing, and National Taiwan University.

In November, Maskin spoke on the subject of “Evolution and Repeated Games” at a conference in honor of James Friedman at Duke University. This was also the subject of lectures at the Santa Fe Institute, University of California, Irvine, Princeton University, the St. Petersburg School of Economics, and the Hebrew University of Jerusalem. In March, he gave the Marshall Lectures at Cambridge University on the question, “Is Majority Rule the Best Voting Method?,” and in May he gave the Pazner Memorial Lecture at the University of Tel Aviv on “Majority Rule and Strategic Voting.” Finally, in May, Maskin gave the Lawrence Klein Lecture at the University of Pennsylvania on the subject of “Inequality, Matching, and Globalization.” This was also the subject of lectures at the Institute for Advanced Study and the Eighth International Conference at Moscow State University.



Harold F. Linder Professor **Joan W. Scott** spent much of the year preparing two books for publication in the fall of 2007 and the spring of 2008. She delivered papers at Princeton University; the meetings of the Middle East Studies Association; the Yale University Legal Theory Workshop; the University of Illinois, Champaign-Urbana; the University of Michigan; Columbia University; and the Institute for French Studies at New York University. She gave the Presidential Lecture at Stanford University and the Skotheim Lecture at Whitman College. She received an honorary degree from Harvard University at its June commencement.

During the academic year 2006–07, UPS Foundation Professor **Michael Walzer** gave the Caroline and Joseph S. Gruss Lecture at New York University School of Law, the Tenth Annual Law and Philosophy Lecture at Columbia Law School, and a Faculty Lecture at the Institute for Advanced Study. He delivered two lectures as scholar-in-residence for the inauguration of the Center for Ethics at Yeshiva University (New York), and also lectured at YIVO Institute for Jewish Research (New York), the Hebrew University of Jerusalem, the University of Regina (Saskatchewan, Canada), Princeton University, and at an NEH Summer Institute at The Graduate Center, CUNY. In addition, he participated in a conference on the Nuremberg Trials at Washington University; a colloquium on humanitarian intervention at Kfar Blum, Israel; a panel discussion on the American Left at The Graduate Center, CUNY; a conference on the future of the welfare state at The University of Texas at Austin; a panel discussion at the American Political Science Association in Philadelphia; and a discussion of Jean Elshtain's "Just War against Terror" at the International Studies Association in Chicago.

Professor Walzer's most recent book, *Politics and Passion: Toward a More Egalitarian Liberalism*, came out in Polish. His *Just and Unjust Wars* appeared for the first time in Dutch, and a fourth edition of the English version containing a new preface was also published by Basic Books. It was announced that volumes one and two of *The Jewish Political Tradition* (co-edited with Menachem Lorberbaum, Noam Zohar, Yair Lorberbaum, and Ari Ackerman) will be released in Chinese (simplified characters) in 2008.

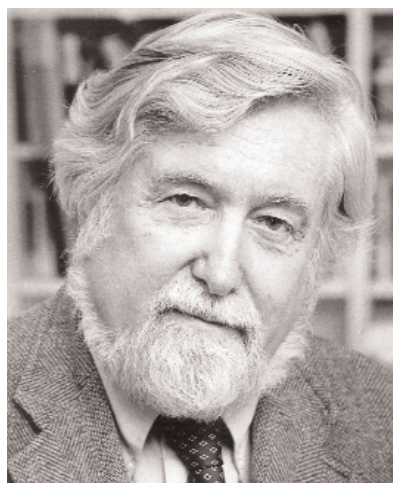


DINAH KAZAKOFF

Professor Joan Wallach Scott gave a Faculty lecture in December on "Cover-up: French Gender Equality and the Islamic Headscarf," in which she analyzed one of the justifications given by French lawmakers for a 2004 law banning the wearing of Islamic headscarves in French public schools—that they were protecting the equality of women, a founding principle of the French Republic.



PATRICK CHABAL



RANDALL HAGADORN

Members (left) shared research in biweekly seminars on "The 'Third World' Now," the School's thematic focus for 2006–07, which noted anthropologist Clifford Geertz (right), founding Professor of the School of Social Science, conceived of before his death in October. In March, more than 200 people attended a memorial in Professor Geertz's honor at the Institute.



## MEMBERS, VISITORS, AND RESEARCH STAFF

### Attila Ambrus

*Economics* ♦ Harvard University  
*Richard B. Fisher Membership*

### Dan Ariely

*Psychology* ♦ Massachusetts Institute of Technology ♦ *v*

### Sumedha Gupta Ariely

*Psychology* ♦ Massachusetts Institute of Technology ♦ *v*

### Hagit Benbaji

*Philosophy* ♦ Ben-Gurion University ♦ *v*

### Yitzhak Benbaji

*Political Science* ♦ Bar-Ilan University

### Amy Borovoy

*Anthropology* ♦ Princeton University

### Edmund Burke, III

*History* ♦ University of California, Santa Cruz ♦ *v, f*

### Patrick Chabal

*Political Science* ♦ King's College London

### In-Koo Cho

*Economics* ♦ University of Illinois, Champaign-Urbana  
*Deutsche Bank Membership*

### Forrest D. Colburn

*Political Science* ♦ The Graduate Center, City University of New York

### Eugene Cooper

*Anthropology* ♦ University of Southern California

### Elisabeth H. Ellis

*Political Science* ♦ Texas A&M University  
*National Endowment for the Humanities Fellow*

### Henry S. Farber

*Economics* ♦ Princeton University  
*Leon Levy Foundation Member*

### Steven Feierman

*History* ♦ University of Pennsylvania  
*National Endowment for the Humanities Fellow*

### Erica Field

*Economics* ♦ Harvard University  
*The Roger W. Ferguson, Jr. and Annette L. Nazareth Membership*

### Ariel Furstenberg

*Political Science* ♦ Tel-Aviv University and Shalom Hartman Institute ♦ *a*

### Kristen Ghodsee

*Anthropology* ♦ Bowdoin College

### Susanna Hecht

*Geography* ♦ University of California, Los Angeles

### Kristin Hoganson

*History* ♦ University of Illinois, Champaign-Urbana ♦ *v*

### A. B. Huber

*Literature* ♦ University of California, Berkeley ♦ *a*

### Vijay Krishna

*Economics* ♦ Pennsylvania State University  
*Deutsche Bank Membership*

### Michael LeBuffe

*Philosophy* ♦ Texas A&M University ♦ *v*

### Ching Kwan Lee

*Sociology* ♦ University of Michigan  
*National Endowment for the Humanities Fellow*

### Rosalind C. Morris

*Anthropology* ♦ Columbia University

### Susan Neiman

*Philosophy* ♦ Einstein Forum

### Jennifer Pitts

*Political Science* ♦ Princeton University

### Thomas G. Rawski

*Economics* ♦ University of Pittsburgh ♦ *v, s*

### David Scott

*Anthropology* ♦ Columbia University

### Farzana Shaikh

*Political Science* ♦ University of Cambridge ♦ *v*

### Ban Wang

*Literature* ♦ Rutgers, The State University of New Jersey ♦ *v, s*

### Lisa Wedeen

*Political Science* ♦ University of Chicago  
*Funding provided by the Friends of the Institute for Advanced Study*

*f* First Term ♦ *s* Second Term ♦ *v* Visitor  
*a* Research Assistant

## RECORD OF EVENTS

### September 26

IAS/Princeton University Economics Workshop ♦  
*Decisions Made by Groups* ♦ **Attila Ambrus**,  
Harvard University; Member, School of Social  
Science

### September 28

Social Science Thursday Luncheon Seminar ♦  
*Globalization and Environment: Rethinking the  
Received Ideas* ♦ **Susanna Hecht**, University  
of California, Los Angeles; Member, School of  
Social Science

### October 4

"The 'Third World' Now" Thematic Seminar  
Planning Meeting

### October 5

Social Science Thursday Luncheon Seminar ♦  
*Hobbes, Kant, Marx, Venus: Americans are WHAT?* ♦  
**Susan Neiman**, Einstein Forum; Member,  
School of Social Science

### October 10

IAS/Princeton University Economics Workshop ♦  
*Sincere Voting: A Conjecture* ♦ **Vijay Krishna**,  
Pennsylvania State University; Member,  
School of Social Science (with John Morgan)

### October 11

"The 'Third World' Now" Thematic Seminar ♦  
*The "Origins" of the "Third World": Bandung  
and Beyond* ♦ **Lakhdar Brahimi**, United  
Nations; Director's Visitor, Institute for  
Advanced Study

### October 12

Social Science Thursday Luncheon Seminar ♦  
*Against the Law: Labor Protests in China's  
Rustbelt and Sunbelt* ♦ **Ching Kwan Lee**,  
University of Michigan; Member, School of  
Social Science

### October 19

Social Science Thursday Luncheon Seminar ♦  
*Social Medicine in Africa* ♦ **Steven Feierman**,  
University of Pennsylvania; Member, School  
of Social Science

### October 20

IAS Economics Seminar ♦ *Instinctive and Cog-  
nitive Reasoning: A Study of Response Times* ♦  
**Ariel Rubinstein**, Tel Aviv University and  
New York University

### October 25

"The 'Third World' Now" Thematic Seminar ♦  
*Durable Inequality: The Legacies of China's  
Revolutions and the Pitfalls of Reform* ♦ **Ching  
Kwan Lee**, University of Michigan;  
Member, School of Social Science

### October 26

Social Science Thursday Luncheon Seminar ♦  
*Boundaries of International Law: Victorian Debates* ♦  
**Jennifer Pitts**, Princeton University;  
Member, School of Social Science

### November 2

Social Science Thursday Luncheon Seminar ♦  
*Buying into Empire: U.S. Consumption in the  
Late Nineteenth and Early Twentieth Centuries* ♦  
**Kristin Hoganson**, University of Illinois,  
Champaign-Urbana; Visitor, School of Social  
Science



**November 7**

IAS/Princeton University Economics Workshop ♦ *Equilibrium Degeneracy and Reputation Effects in Continuous Time Games* ♦ **Yuliy Sannikov**, University of California, Berkeley (with Eduardo Faingold)

**November 8**

“The ‘Third World’ Now” Thematic Seminar ♦ *When Physicians Meet* ♦ **Steven Feerman**, University of Pennsylvania; Member, School of Social Science

**November 9**

Social Science Thursday Luncheon Seminar ♦ *Men, Mines, and Mosques: Gender, International Aid, and Islamic Revivalism in the New EU* ♦ **Kristen Ghodsee**, Bowdoin College; Member, School of Social Science

**November 15**

“The ‘Third World’ Now” Thematic Seminar ♦ *The Politics of the Veil* ♦ **Joan Wallach Scott**, Harold F. Linder Professor, School of Social Science

**November 16**

Social Science Thursday Luncheon Seminar ♦ *Spinoza's Normative Ethics* ♦ **Michael LeBuffe**, Texas A&M University; Visitor, School of Social Science

**November 21**

IAS/Princeton University Economics Workshop ♦ *Perishable Durable Goods* ♦ **In-Koo Cho**, University of Illinois, Champaign-Urbana; Member, School of Social Science

**November 29**

“The ‘Third World’ Now” Thematic Seminar ♦ *Culture Troubles: Can the West Meet the Rest?* ♦ **Patrick Chabal**, Kings College London; Member, School of Social Science

**November 30**

Social Science Thursday Luncheon Seminar ♦ *Varieties of Liberalism: Nation-States as Works in Progress* ♦ **Forrest D. Colburn**, The Graduate Center, City University of New York; Member, School of Social Science

**December 7**

Social Science Thursday Luncheon Seminar ♦ *The Ethnographic State: France, Islam, and Morocco 1900–1925* ♦ **Edmund Burke, III**, University of California, Santa Cruz; Visitor, School of Social Science

**December 13**

“The ‘Third World’ Now” Thematic Seminar ♦ *An Ethnographic Encounter with a Total Social Phenomenon: Understanding the Market/Temple Fairs of Rural Zhejiang* ♦ **Eugene Cooper**, University of Southern California; Member, School of Social Science

**December 14**

Social Science Thursday Luncheon Seminar ♦ *The “Shariatization” of Pakistani Nationalism* ♦ **Farzana Shaikh**, University of Cambridge; Visitor, School of Social Science

**January 18**

Social Science Thursday Luncheon Seminar ♦ *Japan Studies and the Critique of American Individualism* ♦ **Amy Borovoy**, Princeton University; Member, School of Social Science

**January 24**

“The ‘Third World’ Now” Thematic Seminar ♦ *Tropicality 5* ♦ **Susanna Hecht**, University of California, Los Angeles; Member, School of Social Science

**January 25**

Social Science Thursday Luncheon Seminar ♦ *Provisionality and Political Theory* ♦ **Elisabeth H. Ellis**, Texas A&M University; Member, School of Social Science

**February 1**

Social Science Thursday Luncheon Seminar ♦ *China's Manufacturing Capabilities: Micro-foundations and Foreign Policy Implications* ♦ **Thomas G. Rawski**, University of Pittsburgh; Visitor, School of Social Science

**February 6**

IAS/Princeton University Economics Workshop ♦ *Optimal Risk-sharing Contracts in Social Networks* ♦ **Adam Szeidl**, University of California, Berkeley (with Attila Ambrus)

**February 7**

“The ‘Third World’ Now” Thematic Seminar ♦ *Goodbye to the “Third World”* ♦ **Forrest D. Colburn**, The Graduate Center, City University of New York; Member, School of Social Science

**February 8**

Social Science Thursday Luncheon Seminar ♦ *Norms of Self-determination: Thinking Sovereignty Through* ♦ **David Scott**, Columbia University; Member, School of Social Science

**February 15**

Social Science Thursday Luncheon Seminar ♦ *Should Voting Be Compulsory?* ♦ **Vijay Krishna**, Pennsylvania State University; Member, School of Social Science

**February 20**

IAS/Princeton University Economics Workshop ♦ *Prenuptial Agreements and the Emergence of the Dowry System in Bangladesh* ♦ **Erica Field**, Harvard University; Member, School of Social Science

**February 22**

Social Science Thursday Luncheon Seminar ♦ *What Can We Learn from the Collapse of the California Wholesale Electricity Market?* ♦ **In-Koo Cho**, University of Illinois, Champaign-Urbana; Member, School of Social Science

**February 28**

“The ‘Third World’ Now” Thematic Seminar ♦ *Caesaro-papist “Secularism”: Religious Freedoms, Gender Equality, and American Foreign Policy in Contemporary Bulgaria* ♦ **Kristen Ghodsee**, Bowdoin College; Member, School of Social Science

**March 1**

Social Science Thursday Luncheon Seminar ♦ *A Tale of Two Coups: Thailand, 1991–2006* ♦ **Rosalind Morris**, Columbia University; Member, School of Social Science

**March 8**

Social Science Thursday Luncheon Seminar ♦ *The Market/Temple Fairs of Jinhua: Unraveling a Multifunctional Phenomenon* ♦ **Eugene Cooper**, University of Southern California; Member, School of Social Science

**March 14**

“The ‘Third World’ Now” Thematic Seminar ♦ *Peripheral Visions: Political Identifications in Unified Yemen* ♦ **Lisa Wedeen**, University of Chicago; Member, School of Social Science

**March 15**

Social Science Thursday Luncheon Seminar ♦ *Piety in Time: Islamic Politics in the Middle East* ♦ **Lisa Wedeen**, University of Chicago; Member, School of Social Science

**March 20**

IAS/Princeton University Economics Workshop ♦ *Coalition Formation in Political Games* ♦ **Konstantin Sonin**, New Economic School/CEFIR (joint with Daron Acemoglu and Georgy Egorov)

**March 21**

“The ‘Third World’ Now” Thematic Seminar ♦ *Accidental Histories: A South African Story* ♦ **Rosalind Morris**, Columbia University; Member, School of Social Science

**March 22**

Social Science Thursday Luncheon Seminar ♦ *What Is Social Science For? Reflections on the Art of Comparative Politics* ♦ **Patrick Chabal**, King's College London; Member, School of Social Science

**March 29**

Social Science Thursday Luncheon Seminar ♦ *Is Tomorrow Another Day? The Economics and Psychology of Hours of Work* ♦ **Henry S. Farber**, Princeton University; Member, School of Social Science

#### April 4

“The ‘Third World’ Now” Workshop ♦  
*Sectarian Myths and the Politics of Exclusion in Pakistan* ♦ **Farzana Shaikh**, University of Cambridge; Visitor, School of Social Science

#### April 10

IAS/Princeton University Economics Seminar ♦  
*Are Voters Rational: Outcomes and Turnout in Union Representation Elections* ♦ **Henry S. Farber**, Princeton University; Member, School of Social Science

#### April 12

Social Science Thursday Luncheon Seminar ♦  
*War, Responsibility, and the Moral Equality of Soldiers* ♦ **Yitzhak Benbaji**, Bar-Ilan University; Member, School of Social Science

#### April 18

“The ‘Third World’ Now” Thematic Seminar ♦  
*The Hinge of History* ♦ **David Scott**, Columbia University; Member, School of Social Science

#### April 19

Social Science Thursday Luncheon Seminar ♦  
*Muslim Family Law, Prenuptial Agreements, and the Spread of Dowry in Bangladesh* ♦ **Erica Field**, Harvard University; Member, School of Social Science

#### April 24

School of Social Science Special Seminar ♦  
*Getting to the Bottom of Corruption: An African Case Study in Community Driven Development* ♦ **Jean Ensminger**, California Institute of Technology

#### April 26

Social Science Thursday Luncheon Seminar ♦  
*Group vs. Individual Decision Making—An Experimental Investigation* ♦ **Attila Ambrus**, Harvard University; Member, School of Social Science

#### May 3

Social Science Thursday Luncheon Seminar ♦  
*Geopolitics, National Development, and Third World Cinema in the Cultural Revolution* ♦ **Ban Wang**, Rutgers, The State University of New Jersey; Visitor, School of Social Science

#### May 10

Social Science Thursday Luncheon Seminar ♦  
*In Defense of Phenomenal Dispositions of Physical Objects* ♦ **Hagit Benbaji**, Ben-Gurion University; Visitor, School of Social Science

#### May 15

“The ‘Third World’ Now” Seminar ♦  
Discussion of Writings by Clifford Geertz











# Special Programs

## Program in Interdisciplinary Studies

Professor **Piet Hut** divided his time between astrophysics research and his role as the Head of the Program of Interdisciplinary Studies. The latter program had two year-long Visitors, Hyun Ok Park in historical sociology and Dejan Vinković in astrophysics, as well as eighteen short-term Visitors, with stays ranging from days to weeks, in fields including physics, mathematics, computational science, artificial intelligence, cognitive science, philosophy, and media.

Professor Hut's main project in astrophysics is the art of computational science, centered around a combination of research and education aimed at encouraging collaborations of computational scientists in the development of virtual laboratories. This project extends the notion of "open source" to that of "open knowledge," in which not only the software is freely shared but also the background knowledge, represented in the form of dialogues among the researchers developing the software (on their website [www.artcompsci.org](http://www.artcompsci.org)).

A different activity with roots in astrophysics, but with a broadly interdisciplinary character, is the B612 Foundation ([www.b612foundation.org](http://www.b612foundation.org)). Founded by Professor Hut and colleagues in 2002, B612's stated goal is "to significantly alter the orbit of an asteroid, in a controlled manner, by 2015." The motivation is to stimulate the development of techniques to protect the Earth when a detected asteroid is on collision course with it.

As another widely interdisciplinary activity, Professor Hut developed a Web project, Ways of Knowing, or WoK for short (at [www.waysofknowing.net](http://www.waysofknowing.net)) in collaboration with Steven Tainer, a logician, philosopher, and teacher of Eastern contemplative traditions, at the Institute for World Religions in Berkeley, California. They now offer a large amount of material, in the form of transcripts of discussions, interviews, and essays, as well as many contributions by volunteers involved in joint research projects.

In the spring of 2007, Professor Hut explored virtual worlds, such as Second Life, as a new medium for organizing research activities in computational astrophysics as well as in interdisciplinary studies in general. He started by giving a series of lectures in the VR3D world of Videoranch, and continued by setting up two separate virtual communities in Qwaq Forums. He reported on the latter in an invited talk at a symposium in Capri, Italy, organized by the International Astronomical Union.

*Founded by Professor Hut and colleagues in 2002, B612's stated goal is "to significantly alter the orbit of an asteroid, in a controlled manner, by 2015." The motivation is to stimulate the development of techniques to protect the Earth when a detected asteroid is on collision course with our planet.*

*Professor Piet Hut (pictured left) developed a Web project, Ways of Knowing ([www.waysofknowing.net](http://www.waysofknowing.net)), in collaboration with Visitor Steven Tainer (right), a logician, philosopher, and teacher of Eastern contemplative traditions, at the Institute for World Religions in Berkeley, California.*



DEJAN VINKOVIĆ



# Artist-in-Residence Program

**Jon Magnussen**, Composer

The 2006–07 academic year marked the final year of *Recent Pasts 20/21*, the Artist-in-Residence Program's four-year exploration into music of the past century, and the final year of composer Jon Magnussen's seven-year residency. *Recent Pasts 20/21* was developed to contribute to a better understanding of the wide variety of aesthetic perspectives in Western art music of the twentieth and twenty-first centuries through chamber music concerts and talks.

The 2006–07 music series explored recent currents in contemporary music in the following concerts: **A Gate into Infinity: Music from a Modern Japan**, featuring Flux Quartet with guest pianist Stephen Gosling, which offered a fascinating musical portrait of Japanese composer Somei Satoh and his compatriots Toru Takemitsu, Toshio Hosokawa, and Toshiro Mayuzumi; **A 21st-Century Virtuosity**, performed by The New York New Music Ensemble, which showcased the music of Steven Mackey, Donald Martino, Augusta Read Thomas, Bernard Rands, and a new work by Jon Magnussen; and **The Lyric Impulse**, which featured Trio Solisti and guest clarinetist Alan Kaye performing the music of Felix Mendelssohn, Robert Beaser, and incoming Artist-in-Residence and Pulitzer Prize-winning composer Paul Moravec. A final concert was added in the spring: **Folk Influences and More: Cambodian, North American, Iranian, and Others**, performed by the Da Capo Chamber Players and featuring the music of Chinary Ung, Joan Tower, Kyle Gann, Reza Vali, Stefan Weisman, and Jon Magnussen.

Speakers in the series were interviewed by Magnussen and included Japanese composer Somei Satoh ("Japan in the World"), who spoke about differences between American and other contemporary music cultures; composer Steven Mackey ("Eating Greens: Steven Mackey Speaks with Jon Magnussen"), who spoke about the creative process and music's place in academia; and composers Robert Beaser and Paul Moravec ("New Tonalities: Robert Beaser and Paul Moravec Speak with Jon Magnussen"), who spoke on the postserial movement of the 1970s, during which composers again began utilizing tertiary harmony in their music.

*Recent Pasts 20/21 was developed to contribute to a better understanding of the wide variety of aesthetic perspectives in Western art music of the twentieth and twenty-first centuries through chamber music concerts and talks.*

In addition to directing *Recent Pasts 20/21*, during the 2006–07 year Magnussen produced a recording of *Psalm* (2002) for chorus, baritone solo, and chamber orchestra featuring Fuma Sacra and Westminster Kantorei, directed by Andrew Megill, with Sumner Thompson (baritone), and members of the Princeton Symphony Orchestra conducted by Mark Laycock. The completed recording will be released on Albany Records along with a previously recorded version of Magnussen's *The Winged* (1996) for chamber orchestra and tape, recorded in 1996 by members of the Juilliard Orchestra with conductor David Briskin. Magnussen also completed commissions for Ebb and Flow, Maui (*Dances Ebb, Dances Flow*, for piano, violin, cello and clarinet); and James Goldsworthy and the "New Works for Young Pianists

Commissioning Project" (*Seven Shorts* for solo piano); and completed *NameSong III* for solo piano. Performances of Magnussen's music took place in New York, Houston, and Princeton this year, and performers included the New York New Music Ensemble ("Two Dances from *Dances Ebb, Dances Flow*"); students from James Goldsworthy's piano studio (*Seven Shorts*); and Da Capo Chamber Players with Blair McMillen, piano (*NameSong I, II and III*).

Having completed his term as Artist-in-Residence, Magnussen accepted the position of Director of Education for the Honolulu Symphony at the end of the spring term.



Artist-in-Residence Jon Magnussen (third from the right) pictured with members of Trio Solisti, guest clarinetist Alan Kaye, and incoming Artist-in-Residence Paul Moravec (left)

DINAH KAZAKOFF

## Director's Visitors

*Director's Visitors, scholars who work in a variety of fields, including areas not represented in the Schools, contribute much to the vitality of the Institute. They are invited to the Institute for varying periods of time, depending on the nature of their work.*

### Lakhdar Brahimi

Lakhdar Brahimi, former Special Adviser to the Secretary-General of the United Nations, attended “The ‘Third World’ Now” seminars of the School of Social Science and delivered the first Lecture on Public Policy on “Afghanistan and Iraq: Failed States or Failed Wars?” He reflected on issues of conflict resolution and postconflict reconstruction with the aim of writing about it during the coming year.

### John Cardy

John Cardy is a senior research fellow at All Souls College, Oxford, and a Professor of Physics at Oxford University. During the fall of 2006, he collaborated on research with Members of the School of Mathematics on random curves in lattice models of statistical mechanics and their relation to conformal field theory.

### Louise Dolan

Louise Dolan is a Professor of Physics at the University of North Carolina, and does research in string theory. In the fall of 2006 and the summer of 2007, she collaborated at the Institute on twistor string theory and current algebras, and gave a seminar in the School of Natural Sciences discussing portions of the work.

### Graham Farmelo

Graham Farmelo is Senior Research Fellow at the Science Museum, London, and Associate Professor of Physics at Northeastern University. He is writing a biography of the theoretical physicist Paul Dirac, who spent many sabbaticals at the Institute between 1930 and 1967. During Farmelo's stay at the Institute in the summer of 2007, he completed the biography, which will be published in the United Kingdom in 2008 by Faber.

### Roger Parker

Roger Parker is Thurston Dart Professor of Music at King's College London. He is a musicologist who specializes in nineteenth-century Italian opera, was founding coeditor of the *Cambridge Opera Journal*, and continues as co-general editor of the Donizetti critical edition published by Ricordi of Milan. During his time at the Institute, he worked intensively with coauthor Carolyn Abbate on a new history of opera, to appear with Penguin in the United Kingdom and W. W. Norton in the United States.

### Tom Phillips

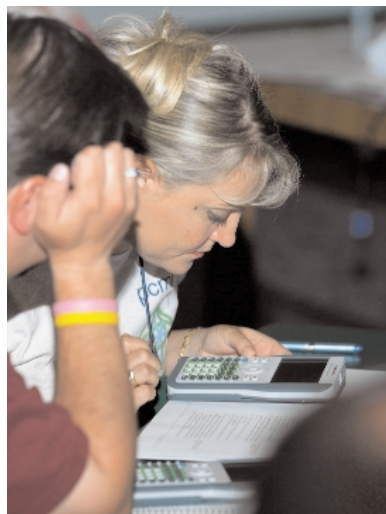
Tom Phillips is a Royal Academician and a Trustee of the British Museum. He was the Slade Professor of Fine Art at the University of Oxford in 2005. As an artist Phillips is known for his pioneering work with word and image and for his portraits of notable figures in science and the arts. He has works in the collections of the Tate, the National Portrait Gallery, and the Museum of Modern Art (MoMA). Phillips also is an accomplished poet, translator, musician, and composer. During his stay at the Institute, he researched the leaf colors of fall, worked on the leaf sudoku *Halting the Fall on Einstein Drive* (right), and presented a third of the opera *Heart of Darkness*.



COURTESY OF TOM PHILLIPS



# Institute for Advanced Study/Park City Mathematics Institute (PCMI)



TODD ROYAL HICKEN

The Summer Session offers each group a series of high quality lectures or seminars combined with activities and events designed to foster all-institute interaction; this interaction, a hallmark of PCMI, serves to increase awareness of the roles of professionals in all mathematics-based occupations.

The IAS/Park City Mathematics Institute (PCMI) is a program of professional development for the mathematics community, including research mathematicians, graduate students, undergraduate students, mathematics education researchers, undergraduate faculty, and mathematics teachers at the secondary school level. Affiliated with the Institute's School of Mathematics, PCMI has been an outreach program of the Institute for Advanced Study since 1994.

The flagship activity of PCMI is the three-week residential Summer Session, held annually in Park City, Utah, which strives to create a strong sense of community for all participants. The session offers each group a series of high quality lectures or seminars combined with activities and events designed to foster all-institute interaction; this interaction, a hallmark of PCMI, serves to increase awareness of the roles of professionals in all mathematics-based occupations.

In addition to the annual Summer Session, PCMI has year-round professional development offerings. Secondary school mathematics teachers may participate in the academic-year activities of PCMI's Math Science Partnership Project (known as PD<sup>3</sup>) or PCMI's many Professional Development and Outreach (PDO) groups. As well, the graduate-level *Park City Mathematics Series* of lecture notes is published and made available to the mathematics research and academic community by the American Mathematical Society.

## The Annual Summer Session

The seventeenth annual Summer Session, held July 1–21, 2007 in Park City, Utah, attracted about 355 participants and opened with a welcome address from the Honorable Jon Huntsman Jr., Governor of the State of Utah. The following programs took place during the Summer Session:

- Designing and Delivering Professional Development Seminar (one week)
- Graduate Summer School
- International Seminar on Mathematics Education: Bridging Policy and Practice (one week)
- Research Program in Mathematics
- Secondary School Teachers Program
- Undergraduate Faculty Program
- Undergraduate Summer School

The mathematical topic for 2007 was Statistical Mechanics; this topic informed the work of the Graduate Summer School, the Research Program, the Undergraduate Summer School, and the Undergraduate Faculty Program. The topic, Knowledge of Mathematics for Teaching, provided the focus for the education programs, including the International Seminar, the Designing and Delivering Professional Development Seminar, and the Secondary School Teachers Program.

## Graduate Summer School and Research Program

The Graduate Summer School and the Research Program were organized by Professor Scott Sheffield, Courant Institute of Mathematics, and Professor Thomas Spencer, Institute for Advanced Study.

Statistical mechanics is a broad and very active field of research, which attracted a wide audience of students and researchers. The Graduate Summer School drew 140 applications and the research program drew more than eighty. With the addition of financial support from institutional and individual research grants, the program was able to accommodate ninety-six graduate student participants and seventy researchers.

### The Graduate Summer School

There were six graduate courses aimed at bringing the current developments in statistical mechanics to the participants:

An Introduction to the Schramm Löwner Evolution; Gregory Lawler, University of Chicago  
 Zeros of Gaussian Analytic Functions, Determinantal Processes and Gravitational Allocation; Yuval Peres, Microsoft Research and University of California, Berkeley  
 Lectures on Random Matrices; Alice Guionnet, École Normale Supérieure de Lyon  
 The Renormalization Group and Equilibrium Statistical Mechanics; David Brydges, University of British Columbia  
 Dimers and Random Surfaces; Richard Kenyon, University of British Columbia  
 Conformal Invariant Models; Wendelin Werner, Université Paris-Sud

The **Colloquium Lecture Series**, designed to be both accessible to graduate students and interesting to those in the research program, was introduced this year:

Continuum Limits of Random Matrices; Balint Virag, University of Toronto  
 Conformal Random Geometry and Quantum Gravity; Bertrand Duplantier, Service de Physique Théorique de Saclay  
 Random shapes and Random Maps: SLE and Significant Others; Ilya Gruzberg, University of Chicago  
 Wave Fronts and Frozen Boundaries; Andrei Okounkov, Princeton University  
 Random Walks and Interfaces; Alain-Sol Sznitman, ETH Zurich  
 Scaling Limits of Large Systems of Interacting Particles; Srinivasa Varadhan, New York University

### The Research Program

The Research Program was initiated this year by a Cross Program lecture, “A Random Walk through Statistical Mechanics,” by Thomas Spencer. The core of the Research Program comprised a series of seminar talks:

Asymptotics for Two-interval SLE Hitting Probabilities on the Real Line; Tom Alberts, Courant Institute NYU  
 Long Time Fluctuations of TASEP; Alexei Borodin, California Institute of Technology  
 Spin Glasses and Stein’s Method; Sourav Chatterjee, University of California, Berkeley  
 The Dimer Model with Holes and Electrostatics; Mihai Ciucu, Georgia Institute of Technology  
 A Supersymmetric Model for Quantum Diffusion in 3D; Margherita Disertori, Université de Rouen/Laboratoire de mathématiques Raphaël Salem  
 A Stochastic Growth of an Interface on a Plane: Fluctuations for the KPZ Universality Class; Patrik Ferrari, Weierstrass Institute for Applied Analysis and Stochastics  
 Random Even Graphs and the Quantum Ising Model; Geoffrey Grimmett, University of Cambridge  
 Rational Resonances in Random Cycles on a Torus; Alan Hammond, Courant Institute  
 Derivative Estimates and Second Moment Bounds for SLE; Gregory Lawler, University of Chicago  
 Dimension and Natural Parametrization for SLE; Gregory Lawler, University of Chicago  
 Gaussian Techniques in Additive Combinatorics, Computational complexity, and Social Choice; Elchanan Mossel, University of California, Berkeley  
 Critical Random Graphs: Diameter and Mixing Time; Asaf Nachmias, University of California, Berkeley  
 The Percolation Signature of the Spin Glass Phase; Charles Newman, NYU Courant Institute  
 Gradient Percolation and Related Questions; Pierre Nolin, École Normale Supérieure  
 Strip Tableaux: An Exactly Solvable Model; Dan Romik, Bell Laboratories  
 The Discrete Dynamical Web and its Natural Scaling Limit; Emmanuel Schertzer, Courant Institute  
 Continuum Quantum Gravity for SLE experts; Scott Sheffield, Courant Institute of Mathematics



Spontaneous Resonances in Information Networks and Poisson Hypothesis Breaking—Particle Systems with Continuous Memory; Semen Shlosman, Centre de Physique Théorique, Marseille  
 Conformal Invariance in 2D Ising model (seminar given in three parts); Stanislav Smirnov, Université de Genève  
 Dynamical Sensitivity of the Infinite Cluster in Critical Percolation; Jeffrey Steif, Chalmers University of Technology  
 Scaling Limits of Large Systems of Interacting Particles; Srinivasa Varadhan, New York University  
 Reversibility and Duality of SLE; Dapeng Zhan, University of California, Berkeley

### Clay Mathematics Institute Senior Scholar-in-Residence

Through the generous support of the Clay Mathematics Institute, Cambridge, Massachusetts, PCMI welcomed two Senior Scholars-in-Residence to the 2007 Summer Session: Andrei Okounkov, Princeton University; and Srinivasa Varadhan, Courant Mathematics Institute. Varadhan gave a lecture in the Secondary School Teachers Program, “Informal Discussion on Probability for Secondary School Teachers,” and gave a public lecture, “Developments in Probability Theory: A Brief History,” describing the early history of probability and its placement in the wider context of statistical mechanics. Okounkov also spoke to the Secondary School Teachers Program and gave a well-received public lecture, “The Most Random of All Possible Worlds.” The Clay Senior Scholar-in-Residence program, which is in its fourth year at PCMI, has become a keystone to the success of the PCMI Graduate Summer School and Research Program.

### Undergraduate Summer School

Some forty-eight undergraduate students attended the Undergraduate Summer School (USS) at the PCMI Summer Session. The USS was organized around two courses, one aimed at introductory-level students (in this year’s case, students whose backgrounds included some probability but no advanced analysis) and the other intended for students at a more advanced undergraduate level. The introductory course was “A Nontechnical Introduction to Recent Advances in Discrete Probability and Mathematical Physics,” taught by Marek Biskup of University of California, Los Angeles. The advanced course was “An Introduction to Brownian Motion and its Applications,” taught by Omer Angel of the University of Toronto.

Professor Biskup’s introductory course focused on random walks, branching processes, and percolation. Professor Angel’s advanced course discussed Brownian motion in one and higher dimensions. Beautiful lecture notes were produced, and are available at Biskup’s homepage: [www.math.ucla.edu/~biskup/](http://www.math.ucla.edu/~biskup/). The intent is to publish lecture notes from both courses together in a single book suitable for advanced undergraduates.

### Undergraduate Faculty Program

The Undergraduate Faculty Program (UFP) was organized and coordinated by David A. Levin of the University of Oregon. Professor Levin presented a course on “Markov Chains and Mixing Times,” studying how fast a system becomes well mixed. The classic example of these problems is card shuffling; the course considered several strategies for shuffling a deck, in addition to random-walks on graphs, and many other problems that coordinated well with the statistical mechanics theme.

Another objective of the UFP, in addition to developing the subject area, was to demonstrate how to incorporate materials on Markov chains and mixing times into an undergraduate probability course. To achieve this objective, the twelve lectures were supplemented by seminars in which the participants worked through problems in an informal setting.

In keeping with PCMI’s focus on crossprogram participation, the UFP reached out to several of its peer programs at the Summer Session. In addition to the nine UFP participants, a group of seven secondary mathematics teachers led by Darryl Yong (Harvey Mudd College) created a working group on applied probability and attended the UFP class for the first two weeks. Based on their experiences in the class, the group developed two sets of learning materials: 1) a series of worksheets and activities to help secondary-level students explore

*The classic example of these problems is card shuffling; the course considered several strategies for shuffling a deck, in addition to random-walks on graphs, and many other, problems that coordinated well with the overarching statistical mechanics theme of the PCMI program.*

the connection between transition probabilities of a Markov chain and its steady-state probability distribution (without explicitly mentioning those terms or using linear algebra); and 2) a series of lesson plans that construct the concepts of probability and randomness through explorations with shuffling methods and dice rolling. The UFP also attracted a handful of undergraduate and graduate students interested in the topic of mixing times.

David Levin and his coauthors Yuval Peres and Elizabeth Wilmer are presently writing a textbook, *Markov Chains and Mixing Times*. They generously made available the draft manuscript to the UFP participants, providing both a complete set of notes for the course and foundational materials for future explorations in the subject.

### The Secondary School Teacher Program (SSTP)

Fifty-seven middle school and high school teachers spent three weeks learning mathematics, reflecting on what it means to teach mathematics, and working together to produce a product to share with their colleagues both at PCMI and more broadly through Web-based resources at the PCMI website. Courses were delivered electronically to six additional teachers in McAllen, Texas, as part of the Math Science Partnership Project known as PD<sup>3</sup> (PCMI and Districts Partner to Design Professional Development) funded by the National Science Foundation (NSF).

Two NSF grants currently support different aspects of the SSTP. The Math Science Partnership grant supports the PD<sup>3</sup> project, which has been extended to operate through the summer of 2008. A grant from the Teacher Professional Continuum Program provides financial support for non-PD<sup>3</sup> teachers to attend the SSTP as well as funding to turn the mathematics course materials into commercial products with supporting facilitators' guides.

Twenty-five teachers at the SSTP were returning for a second or third year and ranged from teachers with one year of teaching experience to seasoned veterans. A special component of this year's program was the attendance of three high school teachers from Uganda, two of whom had been part of the PCMI International Seminar in previous years. The Ugandan teachers were paired with a program staff member and two PD<sup>3</sup> teachers as part of a project to establish a PCMI-like institute in Uganda during the summer of 2008.

In keeping with PCMI's focus on crossprogram interaction, the SSTP this year realized an increasingly successful interface with the Clay Senior Scholars-in-Residence and other mathematicians at PCMI. Two of the formal crossprogram activities were delivered by the SSTP participants and program staff. The "Pizza and Problem Solving Sessions" brought SSTP participants into an informal and highly collegial situation with participants from the other PCMI programs.

### Designing and Delivering Professional Development (DDPD)

During the first week of the SSTP, fifteen secondary-level mathematics supervisors and university-level mathematics educators attended the Designing and Delivering Professional Development program.

The DDPD participants attended the regular SSTP sessions and then spent time considering the role of proof and its treatment in secondary mathematics and in professional development programs. Darryl Yong from Harvey Mudd and Brian Hopkins from St. Peters College each shared some of the activities they conducted with their respective PDO groups, and Nicole Davis from the Seattle PD<sup>3</sup> site shared the complex instruction approach to teaching that is being used by the teachers in the Seattle PD<sup>3</sup> schools. In the other sessions, participants solved problems that introduced concepts and then discussed the process of finding solutions, the reasoning used, and the role of proof. Johnny Lott from the University of Mississippi chaired the sessions and also provided individual small group discussion sessions for those with particular interests or challenges.

### Mathematics Education Research Program

Began in 2001, the annual PCMI "International Seminar on Mathematics Education: Bridging Policy and

*In the other sessions, participants solved problems that introduced concepts and then discussed the process of finding solutions, the reasoning used, and the role of proof.*



*The 2007 International Seminar focused on reasoning and proof, the implications of technology, and the mathematical knowledge needed by teachers for working with these concepts.*

Practice” brings diverse perspectives and practices to a U.S. national dialogue on mathematics education. The 2007 International Seminar focused on reasoning and proof, the implications of technology, and the mathematical knowledge needed by teachers for working with these concepts. This year’s International Seminar brought teams from Australia, Colombia, Mexico, Namibia, the Netherlands, Turkey, and Vietnam to work with a team from the United States. Each team included two participants, a currently practicing teacher and an educational policy person or mathematics education researcher.

During the International Seminar, each participating country presented a short report giving their viewpoints on specific questions related to reasoning and proof. The reports were discussed and responded to by each of the other countries, and issues emerging from the conversations formed the basis for jointly written policy

briefs: *Assessment of Reasoning and Proof*, *Conditions for the Effective Teaching and Learning of Reasoning and Proof*, and *The Nature and Role of Proof*.

### Crossprogram Activities

Crossprogram Activities take many forms and are a defining feature of PCMI, serving to build understanding, professional respect, and a sense of shared purpose among all the constituents of the mathematical enterprise. Formal and informal Crossprogram Activities were held in the afternoons and evenings during the 2007 Summer Session.

The annual Fourth of July Parade in Park City is a popular event involving the creation and execution of a mathematical entry. This year’s PCMI entry was “America at Its Prime.” Ninety-two participants from across the PCMI programs marched together in the parade, executing, among other things, a “random walk” in keeping with PCMI’s mathematical theme. The entry, directed by Secondary School Teacher and PD<sup>3</sup> participant Alan Bond, was awarded the prize for “Smartest Entry” by the Park City Ambassadors Parade Committee.

Two evenings of “Pizza and Problem Solving” were organized and presented by Andrew Bernoff of Harvey Mudd College: “Some Random Problems from Statistical Mechanics” and “Mathematical Games.” On each of these two evenings, between 180 and 220 participants attended, representing all the programs at PCMI. The participants tackled brainteasers together and presented solutions to each other at the end of the evening.

Other evening activities included the opening and closing dinners for participants and their families as well as a session of building cells and other structures with Zometools. The full listing of formal Crossprogram Activities is as follows:

Address of Welcome by the Honorable Jon Huntsman Jr., Governor of the State of Utah

Pizza and Problem Solving (2 sessions); Andrew Bernoff, Harvey Mudd College.

Fourth of July Parade: America at Its Prime (prize-winner for “Smartest Entry”)

A Random Walk through Statistical Mechanics; Thomas Spencer, Institute for Advanced Study

Zometools and Their Underlying Mathematics; Margaret Cagle, Brian Hopkins, Philip Mallinson, Henri Picciotto

Zometools and 120 Cell (hands-on activity)

Polyhedra Building (hands-on activity)

International Teachers’ Perspective on the Role of Proof

Using Video as a Tool to Examine Students’ Understanding of Mathematics; Nicole Davis and the teachers of the Seattle, Washington, PD<sup>3</sup> site project

The Clay Senior Scholars-in-Residence gave two public lectures, each introduced by James Carlson, Director of the Clay Mathematics Institute:

Developments in Probability Theory: A Brief History; Srinivasa Varadhan, Courant Institute

The Most Random of All Possible Worlds; Andrei Okounkov, Princeton University

### PD<sup>3</sup>: PCMI and Districts Partner to Design Professional Development

PCMI received a three-year Math Science Partnership (MSP) award from the National Science Foundation in 2003, the prototype “Institutes award” for the nationwide MSP project at that time. With that award, professional development partnerships in three diverse school districts were created as part of a project known as PD<sup>3</sup>; Cincinnati (Ohio), McAllen (Texas), and Seattle (Washington) were the initial project sites. In the summer of 2006, PCMI received a two-year continuation of that funding from the National Science Foundation, ensuring that the PD<sup>3</sup> project will continue through the summer of 2008. In the fall of 2006, the Las Cruces and Gadsden school districts in New Mexico took the place of the Cincinnati project schools; the Cincinnati project was lost through a major change in district personnel and district policy in 2005–06. The Seattle project and the McAllen project will continue to be part of the PD<sup>3</sup> program.

The PD<sup>3</sup> project supports the participation of teachers and district administrators working in concert with university mathematicians and mathematics educators to design professional development offerings based on PCMI’s three-fold model: 1) continuing to do mathematics, 2) reflection on teaching practice, and 3) becoming and serving as a resource to one’s colleagues. Activities at the sites are unique to the needs of each school’s teachers and curriculum, with a core group of teachers expected to attend the PCMI Summer Session each year, either in Park City or via the “e-table” format. The goal is to promote change in individual schools and eventually to entire districts.

In each of the three school districts, PCMI strives to attain three goals it hypothesizes will bring improvement in teaching and learning mathematics in the school: 1) teachers open their doors (to colleagues, administrators, and parents) and make teaching public; 2) district and building administrators support the PD<sup>3</sup> professional development program; 3) teachers serve as leaders in developing and modeling ways to improve mathematics teaching and learning in their buildings and districts.

### Teacher Professional Continuum (TPC) Project

Since 2001, PCMI has offered a problem-based mathematics course to the Secondary School Teacher participants at the annual Summer Session, based on a mathematical theme related in some way to the PCMI mathematical topic. The National Science Foundation in 2006 awarded a grant to PCMI whereby this mathematical course is developed into a published series of professional development materials suitable for use by 1) universities as undergraduate courses; 2) professional development organizations; and 3) other programs and organizations, including in-service teachers. The materials, created and implemented at PCMI by the Education Development Center (EDC) of Newton, Massachusetts, are unique in their approach to mathematics-based professional development for teachers, requiring group work and offering multiple points of access to accommodate the varying education levels of participants.

### Uganda Initiative

During 2007, PCMI continued its commitment to support the establishment of a PCMI-like institute in Uganda within the next few years. This commitment originated in response to an invitation from the World Bank Education Sector, which helped identify Ugandan mathematics leadership and initially intended to provide funding for the project. Adequate funding for the event itself did not materialize; however, interest and expectations had already arisen among Ugandan mathematics professionals. PCMI continued to uphold its commitment to prepare those Ugandan professionals to lead an institute in Uganda, if and when funding is secured.

In 2005, a Ugandan mathematician in the area of biomathematics participated in the PCMI Summer Session Research Program and Graduate Summer School on mathematical biology. In both 2005 and 2006, a Ugandan mathematics educator and a Ugandan secondary teacher participated in the PCMI International Seminar to help formulate the overall structure of an eventual PCMI-Uganda. In July 2007, three Ugandan secondary teachers teamed with a U.S. teacher in the PCMI

*In both 2005 and 2006, a Ugandan mathematics educator and a Ugandan secondary teacher participated in the PCMI International Seminar to help formulate the overall structure of an eventual PCMI-Uganda.*



Secondary School Teachers Program. This team of six will serve as the teacher-mentor team in the eventual program for Ugandan teachers.

PCMI has contributed its own resources to this enterprise, and additional support has been received from the Millennium Science Initiative, the International Mathematical Union, and the National Science Foundation Mathematical Biosciences Institute. PCMI continues to be active in the search to secure core funding needed to finally establish PCMI-Uganda.

### Publication Series

PCMI is very pleased to make the proceedings of its Summer Session available to the public. The publication of Volume 13 is slated for late 2007, with Volumes 14 and 15 due in 2008.

Also published are five volumes in the *Park City Mathematics Institute Subseries*, which is a subsection of the *AMS Student Mathematics Series*. These volumes are aimed at undergraduate students and are published independently of the Park City Mathematics Series mentioned above.

All published volumes are available either from the American Mathematical Society or through popular national bookstores.

### Funding

The IAS/Park City Mathematics Institute was made possible by the generosity of the following funders:

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The topic for the 2008 Summer Session will be *Analytic and Algebraic Geometry: Common Problems—Different Methods*. The organizers are Jeffrey McNeal, The Ohio State University, and Mircea Mustata, University of Michigan. The Clay Senior Scholar-in-Residence will be Robert Lazarsfeld, University of Michigan, with Yum-Tong Sui, Harvard University, as a Program Principle.







# The Libraries

The Historical Studies–Social Science Library (Marcia Tucker, Librarian) contains some 120,000 volumes and has subscriptions to over 1,200 journals. The HS–SS Library is strongest in classical studies, ancient history, and archaeology, but it contains basic document collections, reference works, and important secondary works of scholarship in most fields of history and the social sciences. The journal collection is extensive, and fairly complete backruns exist to the founding of the Institute. The HS–SS Library has occupied its present building since 1964.

The Institute's rare book collection, the gift of Lessing J. Rosenwald, consists of about 2,000 volumes on the history of science and was compiled by Herbert M. Evans in the 1930s. The collection, which is housed in a special room, includes numerous first editions of important scientific works in mathematics, astronomy, physics, and the life sciences. Additional volumes have been added through various gifts, most notably through the Leon Levy Fund, expanding the subject scope of the collection. The HS–SS Library has begun receiving books from the library of the late Walther Heissig, one of the world's leading authorities on Mongolian and Central Asian studies who founded the Institute of Linguistic and Cultural Sciences of Central Asia at the University of Bonn. Walther Heissig's library comes to the Institute partly as gift and partly on deposit from Princeton University East Asian Studies Department and Princeton University Library.

The HS–SS Library has an extensive collection of offprints, including those received by Professors Andrew E. Z. Alföldi, Kurt Gödel, Ernst H. Kantorowicz, Elias Avery Lowe, Millard Meiss, Erwin Panofsky, Marshall Clagett, Harry Woolf, and former Members Robert Huygens and Walther Kirchner.

The microfilm collections of the HS–SS Library include a large selection from *Manuscripta*, a collection of several thousand fifteenth- to nineteenth-century printed books from the Vatican Library. The Bavarian Academy has given the Institute a microfilm copy of slips presented for the *Thesaurus Linguae Latinae* along with additional material on CD. The HS–SS Library has microfilm copies of the papers of Kurt Gödel and Simone Weil; it also houses the Institute archives. The papers in the collection date from the 1930s and include official correspondence of the Director's Office, minutes of meetings of the Faculty and the Board of Trustees, miscellaneous correspondence concerning past Faculty Members, records of the Electronic Computer Project, and other documents. The archives also include the Institute's photograph collection.

The Mathematics–Natural Sciences Library (Momota Ganguli, Librarian) is based in Fuld Hall with smaller departmental branches spread across campus. The collection, which includes about 30,000 volumes of monographs and bound periodicals as well as 160 print and electronic subscriptions, spans pure and applied mathematics, astrophysics, theoretical and mathematical physics, and biology. The M–NS Library has an extensive collection of the collected works of mathematicians, including works by Gauss, Poincaré, Cauchy, Hardy, Descartes, and Fermat. Each year, the M–NS Library adds about 300 books to its collection.

Both of the Institute's libraries participate in the shared cataloguing system OCLC, which gives Institute scholars computerized access to a database that is in use by 57,000 libraries in 112 countries. Searches of this database retrieve bibliographic information and identify the location of materials. The Institute is a member of the RLG Program SHARES partnership, a resource-sharing program. The Institute's Web-accessible online catalogue provides holdings information for the libraries and is accessible from anywhere in the world. The Institute's libraries are participants in the JSTOR project, which makes available archival electronic versions of many core journals in mathematics and the humanities.

The HS–SS Library maintains a computer center with access to scanners and a variety of software packages for both PCs and Macintoshes, and access to databases in the fields of classical studies, the history of science, and Islamic and French studies. The M–NS Library's electronic resources include access to Math-SciNet, an online catalogue, a variety of indexes, and a growing collection of full-text journals. All scholars affiliated with the Institute enjoy the same privileges as Princeton University faculty in the Princeton University Library system. All scholars also have privileges in the Robert E. Speer Library of the Princeton Theological Seminary. The librarians and the Faculty at the Institute warmly appreciate gifts of books and publications from former and current Members of the Institute.

*The HS–SS Library has begun receiving books from the library of the late Walther Heissig, one of the world's leading authorities on Mongolian and Central Asian studies who founded the Institute of Linguistic and Cultural Sciences of Central Asia at the University of Bonn.*

# Acknowledgments

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The Institute for Advanced Study expresses deep appreciation for all gifts, grants, and pledges to its endowment and capital funds, for annual operating support, and for in-kind contributions in fiscal year 2007. We are deeply indebted to our Founders and to all of our subsequent benefactors for enabling us to maintain the independence that is essential for the continuance of the Institute's mission and the freedom that allows Faculty and Members to pursue the attainment of long-term goals without pressure for immediate results.

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