IAS

Institute for Advanced Study

Faculty and Members 2011–2012

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.

—Louis Bamberger and Caroline Bamberger Fuld, in a letter dated June 4, 1930, to the Institute's first Board of Trustees

Cover Photo: Cliff Moore

Contents

Information contained herein is current as of September 19, 2011.

Mission and History

The Institute for Advanced Study is one of the world's leading centers for theoretical research and intellectual inquiry. The Institute 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. It provides for the mentoring of scholars by Faculty, and it offers all who work there the freedom to undertake research that will make significant contributions in any of the broad range of fields in the sciences and humanities studied at the Institute.

Founded in 1930 by Louis Bamberger and his sister Caroline Bamberger Fuld, the Institute was established through the vision of founding Director Abraham Flexner. Past Faculty have included Albert Einstein, who arrived in 1933 and remained at the Institute until his death in 1955, and other distinguished scientists and scholars such as Kurt Gödel, George F. Kennan, Erwin Panofsky, Homer A. Thompson, John von Neumann, and Hermann Weyl.

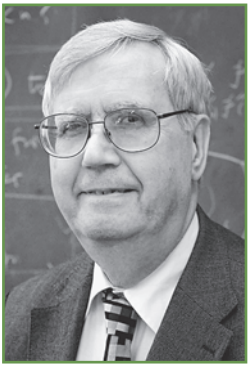
Abraham Flexner was succeeded as Director in 1939 by Frank Aydelotte, in 1947 by J. Robert Oppenheimer, in 1966 by Carl Kaysen, in 1976 by Harry Woolf, in 1987 by Marvin L. Goldberger, and in 1991 by Phillip A. Griffiths. In January 2004, Peter Goddard became the Institute's eighth Director.

Dedicated to the disinterested pursuit of knowledge, the Institute has had permanent impact, in both intellectual and practical terms, through the work of its Faculty and Members. One of the Institute's unique strengths is its permanent Faculty, 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. The Faculty, numbering no more than twenty-eight, selects and works closely with visiting Members and defines the major themes and questions that become the focus of each School's seminars and other activities. Organized in four Schools (Historical Studies, Mathematics, Natural Sciences, and Social Science),

the Faculty and Members 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 six thousand former Members hold positions of intellectual and scientific leadership in the United States and abroad. Twenty-six Nobel Laureates and thirty-eight out of fifty-two Fields Medalists, as well as many winners of the Wolf and MacArthur prizes, have been affiliated with the Institute.

Located in Princeton, New Jersey, the Institute is a private, independent academic institution with no formal links to other educational institutions. However, there is a great deal of intellectual, cultural, and social interaction with other nearby institutions. The Institute's Historical Studies–Social Science Library has a collection of some 120,000 volumes and subscribes to more than 1,000 journals. The Mathematics–Natural Sciences Library contains about 30,000 volumes and an important collection of journals. Institute scholars have full access to the libraries of Princeton University and the Princeton Theological Seminary.

The Institute is situated on eight hundred acres of land, the majority of which is conserved permanently, forming a key link in a network of green spaces in central New Jersey and providing a tranquil environment for Institute scholars and members of the community. 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.



Peter Goddard
Director

Peter Goddard, a mathematical physicist, is distinguished for his pioneering contributions in the areas of string theory, quantum field theory, and conformal field theory. Formerly Master of St. John's College and Professor of Theoretical Physics in the University of Cambridge, England, he played a key role in the establishment of the university's Isaac Newton Institute for Mathematical Sciences, serving as its first Deputy Director, and the University of Cambridge Centre for Mathematical Sciences, one of the world's largest centers for research and teaching in the mathematical sciences.

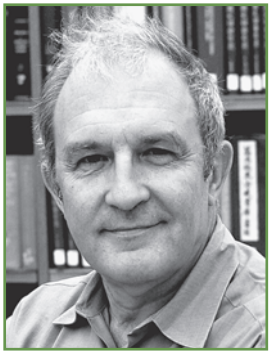
School of Historical Studies

Administrative Officer: Marian Gallagher Zelazny

The School of Historical Studies was established in 1949 with the merging of the School of Economics and Politics and the School of Humanistic Studies. It bears no resemblance to a traditional academic history department, but rather supports all learning for which historical methods are appropriate. The School embraces a historical approach to research throughout the humanistic disciplines, from socioeconomic developments, political theory, and modern international relations, to the history of art, science, philosophy, music, and literature. In geographical terms, the School concentrates primarily on the history of Western, Near Eastern, and Far Eastern civilizations, with emphasis on Greek and Roman civilization, the history of Europe (medieval, early modern, and modern), the Islamic world, and East Asia. The School has also supported scholars whose work focuses on other regions, including Central Asia, India, Africa, and the Americas.

The Faculty and Members of the School do not adhere to any one point of view but practice a range of methods of inquiry and scholarly styles, both traditional and innovative. Uniquely positioned to sponsor work that crosses conventional departmental and professional boundaries, the School actively promotes interdisciplinary research and cross-fertilization of ideas. It thereby encourages the creation of new historical enterprises.

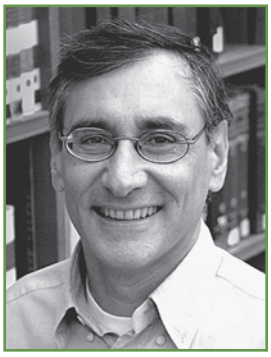
Faculty



Yve-Alain Bois

Professor · Art History

A specialist in twentieth-century European and American art, Yve-Alain Bois is recognized as an expert on a wide range of artists, from Henri Matisse and Pablo Picasso to Piet Mondrian, Barnett Newman, and Ellsworth Kelly. The curator of a number of influential exhibitions, he is currently working on several long-term projects, including a study of Barnett Newman's paintings, the catalogue raisonné of Ellsworth Kelly's paintings and sculptures, and the modern history of axonometric projection.



Angelos Chaniotis

Professor · Ancient History and Classics

Angelos Chaniotis is engaged in wide-ranging research in the social, cultural, religious, legal, and economic history of the Hellenistic world and the Roman East. The author of many books and articles and senior editor of the *Supplementum Epigraphicum Graecum*, he has worked on war, religion, communicative aspects of rituals, and strategies of persuasion in the ancient world. His current research focuses on emotions, memory, and identity. Significant questions and dialogues in the field have grown out of his contributions, which have helped to advance understanding of previously unexplored aspects of the ancient world.

Patricia Crone

Andrew W. Mellon Professor · Islamic History

Patricia Crone's research is focused on the Near East from late antiquity to the coming of the Mongols. She is interested in the delineation of the political, religious, and cultural environment in which Islam began and how it transformed, and was itself transformed by, the regions that the Arabs conquered. Originally a political, social, and military historian (some diversions notwithstanding), she has been steadily moving into the history of ideas. She now works mainly on the Qur'an and the cultural and religious traditions of Iraq, Iran, and the formerly Iranian part of Central Asia.

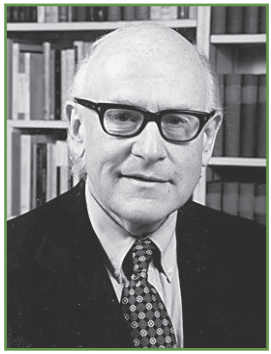
Faculty

Nicola Di Cosmo
Luce Foundation Professor in East Asian Studies · East Asian Studies

Nicola Di Cosmo's research focuses on the history of the relations between China and Inner Asia from prehistory to the early modern period. He is interested in the archaeology of China's northern frontiers, cultural contacts between China and Central Asia, and the military, political, and social history of Chinese dynasties of Inner Asian origin. His most recent and forthcoming works include studies on Chinese military culture, Chinese historiography, the early history of the Manchu state, and relations between Europe and the Mongol empire.

Jonathan Israel
Professor · Modern European History

Jonathan Israel's work is concerned with European and European colonial history from the Renaissance to the eighteenth century. His recent work focuses on the impact of radical thought (especially Spinoza, Bayle, Diderot, and the eighteenth-century French materialists) on the Enlightenment and on the emergence of modern ideas of democracy, equality, toleration, freedom of the press, and individual freedom.



Glen W. Bowersock
Professor Emeritus · Ancient History

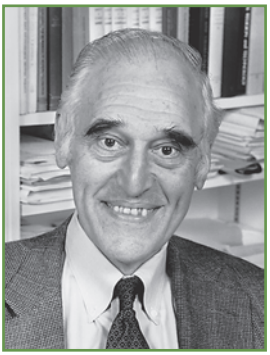
Glen Bowersock is an authority on Greek, Roman, and Near Eastern history and culture as well as the classical tradition in modern literature. The author of numerous important volumes and articles, he uses his exceptional knowledge of classical texts in many languages, together with inscriptions, coins, mosaics, and archaeological remains, to illuminate the mingling of different cultures and to draw unexpected and revelatory conclusions. His research interests include the Greek East in the Roman Empire and late antiquity as well as pre-Islamic Arabia.

Faculty

Caroline Walker Bynum

Professor Emerita · European Medieval History

Caroline Bynum studies the social, cultural, and intellectual history of Europe from the early Middle Ages to the early modern period. Her books have created the paradigm for the study of women's piety that dominates the field of medieval studies today and have helped propel the history of the body into a major area of premodern history. She is currently working on the role of devotional objects in Christianity from the twelfth century to the early years of the sixteenth-century reformations.



Giles Constable

Professor Emeritus · Medieval History

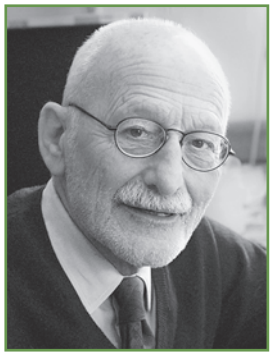
The medievalist Giles Constable is the author or editor of more than twenty books in the area of medieval religious and intellectual history, concerning, among other subjects, the origins of monastic tithes, Peter the Venerable, people and power of Byzantium, medieval religious and social thought, the reformation of the twelfth century, Renaissance Florence as seen through the case of Antonio Rinaldeschi, twelfth-century crusading, and the history of Cluny. He is currently working on books on the fourteenth-century crusading propagandist William of Adam and on the California Gold Rush.

Christian Habicht

Professor Emeritus · Ancient History

Christian Habicht is among the leading historians of the Hellenistic period. He is an authority on Greek epigraphy and on the history of Athens between Alexander the Great and Augustus. He has published books on the Hellenistic ruler-cults, on the Maccabees, on Cicero, and on Pausanias. He has edited hundreds of previously unpublished inscriptions from important sites in Greece and Asia Minor. To a new bilingual edition of Polybius, he contributed the introduction and explanatory notes; the first three of six volumes were published in 2010–11.

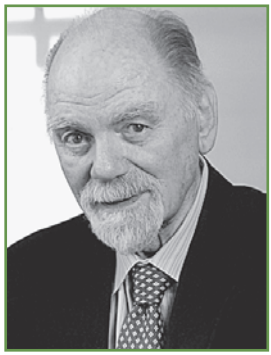
Faculty



Irving Lavin

Professor Emeritus · Art History

Irving Lavin is one of America's most distinguished art historians. He has written extensively on the history of art from late antiquity to modern times, including numerous studies on Italian painting, sculpture, and architecture of the Renaissance and Baroque periods. His interests have focused primarily on the correlation between form and meaning in the visual arts.



Peter Paret

Professor Emeritus · Modern European History

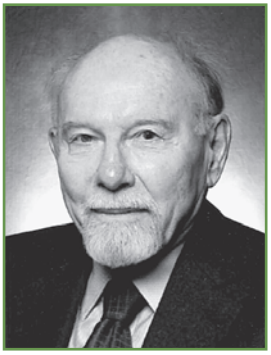
Peter Paret is a cultural and intellectual historian with particular interests in the interaction of war and society since the eighteenth century, the manner in which historians integrate war in their interpretation of other historical forces, and the relationship between tradition and modernism in the art of nineteenth- and twentieth-century Central Europe. His most recent book, *The Cognitive Challenge of War* (2009), studies a Napoleonic campaign as it was shaped by the society, military thought, politics, and art of the time, and influenced their further development in turn.

Heinrich von Staden

Professor Emeritus · Classics and History of Science

Heinrich von Staden has written on a variety of topics in ancient science, medicine, philosophy, and literary theory, from the fifth century B.C. to the fifth century A.D. Drawing on a wide range of scientific, philosophical, and religious sources, he has contributed to the transformation of the history of ancient science and medicine, particularly of the Hellenistic period. His current research is on the role of animals in ancient scientific theories and practices, on genres of scientific and medical literature in antiquity, and on the "semantics of matter" in ancient science and medicine.

Faculty



Morton White

Professor Emeritus · Philosophy and Intellectual History

Morton White is one of America's leading thinkers. In his philosophy of holistic pragmatism, he tries to bridge the positivistic gulf between analytic and synthetic truth as well as that between moral and scientific belief. He maintains that philosophy of science is not philosophy enough, thereby encouraging the examination of other aspects of civilized life—especially art, history, law, politics, and religion—and their relations with science.

Members, Visitors, and Research Staff

Mustafa Aksakal
Ottoman and Turkish History · American University · *s*
Elizabeth and J. Richardson Dilworth Fellow

Mustafa Aksakal's research on the Ottoman Empire during the First World War ties together operational history with the empire's national mobilization and its sweeping domestic transformation. It treats these wartime developments as vital to the understanding of the Republic of Turkey and the Arab Middle East.

Anna Anguissola
Classical Art and Archaeology · Ludwig-Maximilians-Universität München · *f*
The Gladys Krieble Delmas Foundation Member

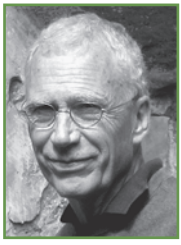
Anna Anguissola is a classical archaeologist and a historian of Greek and Roman art. She works on the role of imitation in Roman visual culture. Her research focuses on the strategies and criteria that guided the exhibition, appreciation, and criticism of copies or quotations from Greek masterpieces and styles.

Jérémie Barthas
History, History of Political Thought · University of Johannesburg
Edwin C. and Elizabeth A. Whitehead Fellow

Jérémie Barthas's project concerns the relationship in early modern Europe between "liberality" (the moral obligation to give) and public finance. It starts by focusing on Machiavelli's *Prince*, chapter 16 (On Liberality and Parsimony), its historical background, theoretical meaning, and *longue durée* influence in both theory and practice.

Emmanuel Bermon
Ancient Philosophy · Université Michel de Montaigne Bordeaux 3 and Institut Universitaire de France · *f*

Emmanuel Bermon's primary area of interest is the philosophy of late antiquity. He is currently preparing a book on the correspondence between Augustine and his friend Nebridius, with a focus on the young Augustine's philosophical knowledge and practice.



Peter Brooks
Comparative Literature · Princeton University · *f*

Peter Brooks is studying Flaubert's *Sentimental Education* (the history of his generation, he said) in relation to both the Revolution of 1848 and the Paris Commune of 1871, and, extending outward, to the nineteenth-century novel generally in relation to the representation of historical event.

f First Term · *s* Second Term · *v* Visitor · *vp* Visiting Professor · *a* Research Assistant

Members, Visitors, and Research Staff

Annemarie Weyl Carr
Art History · Southern Methodist University
William D. Loughlin Member

Annemarie Carr is studying the ways in which the Kykkotissa, a Byzantine holy image still venerated as a miracle worker in its original monastic setting on Cyprus, has ceaselessly recalibrated its appeal as a visual and charismatic medium over its eventful eight-hundred-year life.

Huaiyu Chen
East Asian Studies · Arizona State University
The Starr Foundation East Asian Studies Endowment Fund Member

Huaiyu Chen is preparing a book manuscript on Buddhism and Nestorian Christianity along the Silk Road, focusing on manuscripts and archaeological materials from Dunhuang and Central Asia. He is also working on a new book project exploring the roles and images of animals in medieval Chinese religious life.

Jeremy Cohen
Medieval and Early Modern Jewish History · Tel Aviv University
Funding provided by the National Endowment for the Humanities

Jeremy Cohen is studying *The Rod of Judah* (1520?), an anthology of tales of the Jewish past by Solomon ibn Verga who, expelled from Spain and forcibly baptized in Portugal, engaged history in conversation to chart new directions for European society and politics, and for his Sephardic Jewish diaspora in Christendom.

James Delbourgo
History of Science, Atlantic History · Rutgers, The State University of New Jersey · *f*
The Herodotus Fund

James Delbourgo is writing about Hans Sloane's collections and *Natural History of Jamaica* during the era of the Atlantic slave trade; the imperial origins of the British Museum; and the use of specimens and objects in abolitionism.

Lola Nazarsho Dodkhudoeva
Central Asian History · Institute of Oriental Studies and Written Heritage, Academy of Sciences of the Republic of Tajikistan · *s*
Fund for Historical Studies

Lola Dodkhudoeva's research is focused on the history of Central Asia in medieval and early modern times, with forays into contemporary affairs. She is presently working on a manuscript dedicated to a sixteenth-century ruler of Central Asia trying to model himself on Chingiz Khan.

f First Term · *s* Second Term · *v* Visitor · *vp* Visiting Professor · *a* Research Assistant

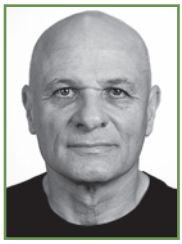
Members, Visitors, and Research Staff

John Curtis Franklin
Classics, Ancient Near East · The University of Vermont · *f*
Elizabeth and J. Richardson Dilworth Fellow

John Franklin's research deals mainly with early Greek cultural history at the Near Eastern interface(s), especially the interaction of poetic/musical traditions. At the Institute, he plans to complete a book examining Kinyras, the mythical priest-king of pre-Greek Cyprus, against Near Eastern evidence for the divinization of temple lyres (e.g., Kinnaru of Ugarit).

Robert Geraci
History of Russia · University of Virginia
Elizabeth and J. Richardson Dilworth Fellow

Robert Geraci is researching the ethnonational diversity of traders and entrepreneurs in the Russian Empire (1700 to 1917), and its political, social, and cultural implications. His work documents conflict between expectations of ethnic Russian control of the commercial economy on the one hand, and the considerable roles of foreigners and minorities on the other.



Israel Gershoni
History of Modern Egypt and the Arab Middle East · Tel Aviv University
Agnes Gund and Daniel Shapiro Member

Israel Gershoni specializes in intellectual and cultural history of modern Egypt and the Arab Middle East. During the academic year 2011–12, his research will examine the role of intellectuals in Egyptian parliamentary government, 1913–52. He locates this subject within the broader framework of the evolution of Egyptian liberalism in the twentieth and twenty-first centuries.

Robert Gerwarth
Early Twentieth-Century History · University College Dublin · *s*
Rosanna and Charles Jaffin Founders' Circle Member

Robert Gerwarth is studying the profound difficulties involved in demobilizing millions of men from around the world after the First World War. His project seeks to explain why political, cultural, and military demobilization failed in many parts of the world, giving rise to extremely violent movements of the extreme Left and Right.

Chad Alan Goldberg
Sociology · University of Wisconsin–Madison
Martin L. and Sarah F. Leibowitz Member

Chad Goldberg is working on a book about the meanings conferred upon Jews and Judaism in the European and American sociological traditions from the nineteenth to early twentieth centuries. His thesis is that Jews served as a touchstone for defining modernity as well as European and American identities.

f First Term · *s* Second Term · *v* Visitor · *vp* Visiting Professor · *a* Research Assistant

Members, Visitors, and Research Staff

Ruth HaCohen
Musicology · The Hebrew University of Jerusalem · *v, f*

Ruth HaCohen has recently completed a study on the historical conflicts between Jewish and Christian conceptions of music. She is currently engaged in exploring the theological and aesthetic aspects of varieties of religious sonic experience. She is also coauthoring a book on the uses and abuses of music in politics.

Tim Harris
Early Modern European History · Brown University
The Andrew W. Mellon Foundation

Tim Harris is working on a study of the revolutionary upheavals in England, Scotland, and Ireland in the seventeenth century, examining the interaction of high and low politics to explore the extent to which the failings of the Stuart monarchy were personal ones or due to deeply rooted structural problems.

Paul Antony Hayward
Medieval History · Lancaster University
George William Cottrell, Jr. Member

Paul Hayward seeks to document and explain how and why the history of the liturgy became a theme in world chronicles composed from around the 1060s onward, chiefly in Germany and England, and to explore the relationship between this phenomenon and the rise of the historical approach to the study of the liturgy.

Samantha Kahn Herrick
Medieval History · Syracuse University

Samantha Herrick studies the legends of medieval saints. She traces their overlapping content and their circulation through institutional networks to discover how relationships among texts and communities influenced medieval Christians' view of sacred history. Her research additionally asks whether sharing stories entailed a sort of collaborative imagination by communities constructing their pasts.

Susan L. Huntington
Art History · The Ohio State University
The Andrew W. Mellon Foundation

Puzzled by the absence of figurative images of the Buddha in the earliest Buddhist art of India, nineteenth-century scholars theorized a religious prohibition as the cause. Susan Huntington's project rejects this presupposition and reexamines the Buddha image in light of new artistic, textual, religious, and technical research.

f First Term · *s* Second Term · *v* Visitor · *vp* Visiting Professor · *a* Research Assistant

Members, Visitors, and Research Staff

Juliette Kennedy
Philosophy and History of Mathematics · University of Helsinki
Otto Neugebauer Fund

Juliette Kennedy is writing a monograph on the foundations and philosophy of mathematics, with Kurt Gödel's view of set-theoretic independence as its main point of departure. She will also focus on some recent developments, both philosophical and technical, that grow out of the effort to eliminate independence phenomena in set theory.

Christina Kiaer
Art History · Northwestern University
The Gladys Krieble Delmas Foundation Member

Taking the Soviet artist Aleksandr Deineka (1899–1969) as a case study, Christina Kiaer's project aims to demonstrate how Socialist Realism offered an alternate model of revolutionary cultural practice, rather than functioning always as the regressive, totalitarian other to the heroic Russian avant-garde, and to Western modernism.

Anne E. Lester
Medieval History · University of Colorado · *s*
The Herodotus Fund

Anne Lester is studying the transmission of relics into Europe following the Fourth Crusade (1204). Focusing on the ways that fragments of the holy transformed religious practices, buildings, and devotion in France, she is exploring how material objects offer a new history of the crusade movement, gendered devotion, and the growth of affective piety.

Brandon Look
History of Modern Philosophy · University of Kentucky
Hans Kohn Member

Brandon Look is working on a monograph that examines Immanuel Kant's interpretation and critique of the metaphysics, epistemology, and natural philosophy of his great rationalist predecessor, Gottfried Wilhelm Leibniz.

Vasileios Marinis
Art and Architectural History · Yale University
Louise and John Steffens Founders' Circle Member

Vasileios Marinis is investigating the intersection of architecture, ritual, and function in the Middle and Late Byzantine churches of Constantinople. He uses archaeological and archival data, hagiographic and historical sources, liturgical texts and commentaries, and monastic typika and testaments to integrate the architecture of these churches with liturgical and extraliturgical practices.

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Members, Visitors, and Research Staff

Louise Marlow
Near Eastern History · Wellesley College · s
Willis F. Doney Member; additional funding provided by The Andrew W. Mellon Foundation

Louise Marlow studies classical Arabic and Persian prose literature, with particular attention to wisdom literature and advisory texts produced in Persianate environments between the ninth and fourteenth centuries. Her work seeks to situate specific writings in their historical and literary contexts and to integrate them into current historical research.

James Matthews
Modern European History · Institute for Advanced Study
George Kennan Member

James Matthews is interested in the intersection of social and military history in twentieth-century Europe. His current objective is to set the Spanish Civil War of 1936–39 in a new and immediately human context via comparative studies of low-ranking combatants on both sides of the conflict.

Yair Mintzker
Modern and Early Modern European History · Princeton University
The Andrew W. Mellon Foundation Fellowships for Assistant Professors

Yair Mintzker's project examines the transformation of German cities from walled to open places. While around 1700 practically all German cities were still surrounded by a wall, little over a century later very few still had one. The project explores the causes of this transformation and its historical significance.

William Mulligan
Modern European History · University College Dublin · *s*
The Herodotus Fund

William Mulligan is examining the transformation of peace—what it meant, how it was imagined, how it was constructed and sustained—in the crucible of the era of the First World War.

Ioannis Mylonopoulos
Classical Art and Archaeology · Columbia University
Funding provided by the National Endowment for the Humanities

Ioannis Mylonopoulos is working on the modes of visualization of the divine in ancient Greece. He is interested in how an abstract idea (the notion of the divine) was visually construed into a concrete vision (the divine image), and how the concrete vision affected the original abstract idea by becoming part of visual memory.

f First Term · *s* Second Term · *v* Visitor · *vp* Visiting Professor · *a* Research Assistant

Members, Visitors, and Research Staff

Bilal Orfali
Islamic Studies, Arabic Literature · American University of Beirut
The Herodotus Fund

Bilal Orfali's interests in Arabic literature and Islamic studies merge in the field of Sufi poetry. His research at the Institute will track the genesis and development of early Sufi poetry by examining the early Sufi poetic motifs in light of other genres of Arabic poetry such as wine, ghazal, and panegyric poetry.

David Allen Pietz
Modern Chinese History · Washington State University
Willis F. Doney Member

David Pietz is working on a science and technology studies and environmental history project that addresses how hydraulic engineering in post-1949 China was shaped by, and in turn shaped, state-building, national identity, and pursuit of communist modernity, and how the ecology of the Yellow River valley was transformed by hydraulic engineering.

Francisco Pina Polo
Classics · Universidad de Zaragoza · *s*
Fund for Historical Studies

Francisco Pina Polo, a specialist on the Roman Republic, is currently working on foreign clientelae in the Western Roman Empire, their relevance as a means of integrating the provinces into the Empire, and their alleged significance as a support structure for certain Roman politicians to obtain power.

Kenneth Pomeranz
Late Imperial and Modern China · University of California, Irvine
The Andrew W. Mellon Foundation

Kenneth Pomeranz is writing a book called "Why is China So Big?" that asks why a very large area and population in this region have been part of a single, generally expanding, polity for so much of history, and how that unity has been reproduced in different eras. It includes historical discussions of ecology, political economy, war-making, culture, and ethnicity.

Adele Reinhartz
First-Century Christianity and Judaism · University of Ottawa
Hetty Goldman Member

Adele Reinhartz is working on a book project, "The Gospel of John and the Parting of the Ways," which will develop a new hypothesis: that the Gospel does not reflect a parting of the ways that has already taken place in the past but rather aims to produce such a separation.

f First Term · *s* Second Term · *v* Visitor · *vp* Visiting Professor · *a* Research Assistant

Members, Visitors, and Research Staff

Gil H. Renberg
Classical Studies, Ancient History · Institute for Advanced Study
AMIAS Member

Trained as a classicist, Gil Renberg works primarily on Greek and Roman religious beliefs and practices, exploring the documentary sources (i.e., inscriptions and papyri) in particular. While at the Institute, he will be completing two related books on inscriptions recording god-sent dreams and the role of such dreams in ancient religion.

Matthias L. Richter
Ancient Chinese Literature and Philosophy · University of Colorado
The Andrew W. Mellon Foundation Fellowships for Assistant Professors

Matthias Richter is writing a book on newly excavated fourth-to-second century B.C.E. Chinese manuscripts, exploring the identity and uses of texts at the time before Imperial librarians in the late first century B.C.E. reconstructed their literary heritage and gave it the form it maintained in transmitted texts.

Vimalin Rujivacharakul
East Asian Studies, Art History · University of Delaware
The Andrew W. Mellon Foundation Fellowships for Assistant Professors

Vimalin Rujivacharakul's research raises questions about how humans conceive, perceive, and write about architecture in relation to their own intellect. For her new book project, she examines the use of visual rhetoric in relation to written narratives in the construction of world architectural discourse.

Behnam Sadeghi
Islamic History · Stanford University
Friends of the Institute for Advanced Study Member

Behnam Sadeghi is exploring early Muslim views about women's role in the public space, how ideas evolved in different localities, and why some of them disappeared while others came to be enshrined in the classical schools of law.

Charles Sanft
East Asian Studies · Universität Münster · *f*
The Starr Foundation East Asian Studies Endowment Fund Member

Charles Sanft's project treats communication as a part of governance in China during the early imperial period. He uses transmitted texts, paleographic materials, and archaeological research to demonstrate how authorities created knowledge of the polity across the realm with the goal of integrating the unified empire.

f First Term · *s* Second Term · *v* Visitor · *vp* Visiting Professor · *a* Research Assistant

Members, Visitors, and Research Staff

Mitra Sharafi
History of Law and Medicine in South Asia · University of Wisconsin Law School
The Andrew W. Mellon Foundation Fellowships for Assistant Professors

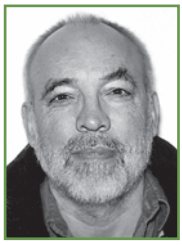
Mitra Sharafi is a lawyer and historian whose work focuses on colonial India. Her first major project examined the use of colonial law by an ethnoreligious minority, the Parsis or Zoroastrians. At the Institute, she will be working on medical jurisprudence in colonial India, the theme of her next project.

W. Anthony Sheppard
Musicology · Williams College
Edward T. Cone Member in Music Studies; additional funding provided by The Andrew W. Mellon Foundation

Tony Sheppard is investigating how composers and performers of vocal music wielded timbre as a tool of expression in the mid-twentieth century. This historical project is based on a comparative analysis of art and popular examples and will offer new approaches to studying the role of musical timbre more generally.

Maria Stavrinaki
Art History · Université Paris 1 Panthéon-Sorbonne · *s*
Gerda Henkel Stiftung Member

Maria Stavrinaki will be studying the temporal regimes—urban primitivism, Dada presentism, and historical simultaneism in Picasso or de Chirico and the invention of prehistory by Surrealism—sustained by practices in Europe from the eve of the First World War to the dawn of the Second.



Christopher Stray
History · Swansea University · *s*
Ralph E. and Doris M. Hansmann Member

Christopher Stray's research concerns the history and sociology of classical scholarship and teaching, largely in the United Kingdom but also using comparative material. While at the Institute, he shall be working on a comprehensive study of Liddell and Scott's Greek-English Lexicon.

Nicola Suthor
Art History · Universität Heidelberg · *f*
Gerda Henkel Stiftung Member

Nicola Suthor's research focuses on the articulation of artistic intelligence in the visual language of painting. She intends to complete a book on the rapport between mimesis and fiction in early modern painting with special emphasis on the concepts of chiaroscuro and non finito.

f First Term · *s* Second Term · *v* Visitor · *vp* Visiting Professor · *a* Research Assistant

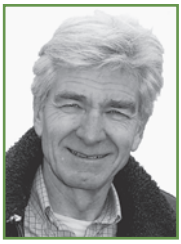
Members, Visitors, and Research Staff

Bella Tendler
Islamic History · Princeton University · *a*

Bella Tendler, a research assistant to Particia Crone, is interested in Islamic heterodoxy. Her current research focuses on secrecy, esotericism, and initiation among the Nusayri-Alawis of Syria. In the coming year, she will study the survival of libertine and antinomian rites in some Nusayri communities of the nineteenth century.

Stephen V. Tracy
Greek History, Epigraphy · The American School of Classical Studies at Athens · *v*

Stephen Tracy is currently involved in preparing for the Berlin Academy a new edition of the decrees of Athens and Attica that date to the years 229 to 168 B.C. He is also preparing a study of Athenian inscriptions of the early fourth century B.C.



Michael van Walt van Praag
Modern International Relations and International Law · Institute for Advanced Study · *vp*

An expert in the field of intrastate conflict resolution and international law as well as a mediator, Michael van Walt seeks to create conditions for equitable peace by addressing core causes of conflict. He is currently exploring innovative ways to overcome obstacles in peace processes posed by conflicting interpretations of history.

Ping Wang
Chinese Literature · Princeton University
The Herodotus Fund

Ping Wang's project questions the validity of a major literary category in Chinese literature called "landscape poetry" by examining pervasive claims made about its emergence and evolution. She argues that the "natural world" as found in the landscape poetry may very well be culturally constructed, historically conditioned, and textually dictated.

Joan Goodnick Westenholz
Ancient Near East · New York University
Felix Gilbert Member

Joan Westenholz is working to deduce the anatomical knowledge of the ancient Mesopotamians and to understand the corporeal human body in Mesopotamian thought. Her work focuses on a unique anatomical lexical series, a compendium enumerating all known parts of the human anatomy and the fundamental characteristics of the human condition.

f First Term · *s* Second Term · *v* Visitor · *vp* Visiting Professor · *a* Research Assistant

Members, Visitors, and Research Staff

Christopher S. Wood
Art History · Yale University · *f*
Elizabeth and J. Richardson Dilworth Fellow

Christopher Wood is writing about portraits of real, modern people embedded in depictions of sacred history, for example the nativity or crucifixion of Christ, in late-medieval and Renaissance Europe.

Marjorie (Jorie) Woods
Medieval Studies · The University of Texas at Austin
Funding provided by the National Endowment for the Humanities

Jorie Woods is analyzing teachers' notes in the margins of fourteenth- and fifteenth-century manuscripts of two widely taught classical texts to determine how female characters were studied, interpreted, sympathetically assimilated, and performed in all-male classrooms. Her research will elucidate more general issues of gender, emotions, creativity, rhetoric, and performance.

Andrea Worm
Art History, Visual Studies · Universität Augsburg · *f*
Willis F. Doney Member

Andrea Worm will work on a group of printed universal chronicles of the late fifteenth century, which take the form of genealogical history diagrams. Her study will focus on how chronicles on the threshold of the early modern period rendered time, history, and geography as visual categories.

School of Mathematics

Administrative Officer: Mary Jane Hayes

The School of Mathematics, established in 1933, was the first School at the Institute for Advanced Study. Oswald Veblen, Albert Einstein, John von Neumann, and Hermann Weyl were the first Faculty appointments. Kurt Gödel, who joined the Faculty in 1953, was one of the School's first Members. Today, the School is an international center for research in mathematics and computer science. Members discover new mathematical results and broaden their interests through seminars and interactions with the Faculty and with each other. Several central themes in mathematics in the last seventy-five years owe their major impetus to discoveries that took place at the Institute. As an example, the creation of one of the first stored-program computers, which von Neumann built on the Institute's campus, influenced the development of today's computers and formed the mathematical basis for computer software.

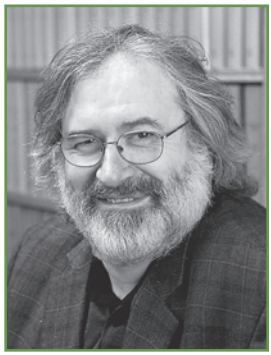
During the 2011–12 academic year, Helmut Hofer, a Professor in the School, and John Mather of Princeton University will lead a program on symplectic dynamics. The mathematical theory of dynamical systems provides tools to understand the complex behavior of many important physical systems. Of particular interest are Hamiltonian systems. Since Poincaré's fundamental contributions, many mathematical tools have been developed to understand such systems. Surprisingly, these developments led to the creation of two seemingly unrelated mathematical disciplines: the fields of dynamical systems and symplectic geometry. In view of the significant advances in both fields, it seems timely to have a program that aims at the development of the common core, which potentially should lead to a new field with highly integrated ideas from both disciplines. Of particular interest will be the study of the dynamics of area-preserving disk maps, the ramifications of new symplectic techniques in three-dimensional hydrodynamics, and questions about the utility of the symplectic pseudoholomorphic curve techniques in questions related to KAM and Aubry-Mather theory. There will be weekly seminars and several workshops.

Other programs associated with the School are the Institute for Advanced Study/Park City Mathematics Institute (PCMI), an innovative program integrating mathematics research and mathematics education, and the Program for Women and Mathematics, jointly sponsored with Princeton University, which brings together research mathematicians with women undergraduate and graduate students for an intensive ten-day workshop held on campus.

Faculty

Jean Bourgain
IBM von Neumann Professor

Jean Bourgain's work touches on many central topics of mathematical analysis: the geometry of Banach spaces, harmonic analysis, ergodic theory, spectral problems, and nonlinear partial differential equations from mathematical physics and combinatorial number theory. His contributions solved longstanding problems in convexity theory and harmonic analysis such as Mahler's conjecture and the lambda-p set problem. His work also had important consequences in theoretical computer science and on exponential sums in analytic number theory. In Hamiltonian dynamics, he developed the theory of invariant Gibbs measures and quasi-periodicity for the Schrödinger equation.



Helmut Hofer
Professor

One of the founders of the area of symplectic topology, Helmut Hofer works on symplectic geometry, dynamical systems, and partial differential equations. His fundamental contributions to the field have led to a new area of mathematics known as "Hofer geometry."

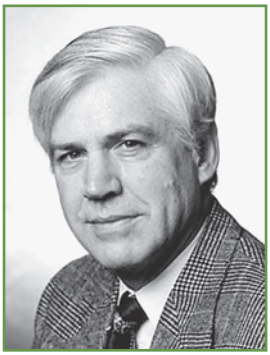
Robert MacPherson
Hermann Weyl Professor

Robert MacPherson's work has introduced radically new approaches to the topology of singular spaces and promoted investigations across a great spectrum of mathematics. He works in several fields of geometry-topology, algebraic geometry, differential geometry, and singularity theory. He is especially interested in aspects of geometry that interact with other areas of mathematics, such as the geometry of spaces of lattices, which interacts with modular forms, and the geometry of toric varieties, which interacts with combinatorics.

Faculty

Peter Sarnak
Professor

Peter Sarnak has made major contributions to number theory and to questions in analysis motivated by number theory. His interest in mathematics is wide-ranging, and his research focuses on the theory of zeta functions and automorphic forms with applications to number theory, combinatorics, and mathematical physics.



Thomas Spencer
Professor

Thomas Spencer has made major contributions to the theory of phase transitions and the study of singularities at the transition temperature. In special cases, he and his collaborators have proved universality at the transition temperature. Spencer has also worked on partial differential equations with stochastic coefficients, especially localization theory. He is presently developing a mathematical theory of supersymmetric path integrals to study the quantum dynamics of a particle in random media. His other interests include random matrices, chaotic behavior of dynamical systems, and nonequilibrium theories of turbulence.

Richard Taylor *(from January 1, 2012)*
Professor

A leader in the field of number theory and in particular Galois representations, automorphic forms, and Shimura variations, Richard Taylor, with his collaborators, has developed powerful new techniques for use in solving longstanding problems, including the Shimura-Taniyama conjecture, the local Langlands conjecture, and the Sato-Tate conjecture. Currently, Taylor is interested in the relationship between l-adic representations for automorphic forms—how to construct l-adic representations for automorphic forms and how to prove given l-adic representations that arise in this way.

Faculty

Vladimir Voevodsky

Professor

Vladimir Voevodsky is known for his work in the homotopy theory of schemes, algebraic K-theory, and interrelations between algebraic geometry and algebraic topology. He made one of the most outstanding advances in algebraic geometry in the past few decades by developing new cohomology theories for algebraic varieties. Among the consequences of his work are the solutions of the Milnor and Bloch-Kato conjectures. Currently, he is interested in type-theoretic formalizations of mathematics and automated proof verification. He is working on new foundations of mathematics based on homotopy-theoretic semantics of Martin-Lof type theories.

Avi Wigderson

Herbert H. Maass Professor

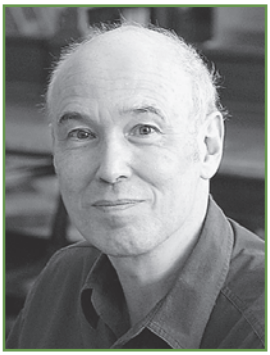
Avi Wigderson is a widely recognized authority in the diverse and evolving field of theoretical computer science. His main research area is computational complexity theory. This field studies the power and limits of efficient computation and is motivated by such fundamental scientific problems as: Does P=NP? [Can mathematical creativity be efficiently automated?] Can every efficient process be efficiently reversed? [Is electronic commerce secure?] Can randomness enhance efficient computation? Can quantum mechanics enhance efficient computation? How do we learn, and can machines be taught to learn like us (or better)?

Enrico Bombieri

Professor Emeritus

Enrico Bombieri, a Fields Medalist for his work on the large sieve and its application to the distribution of prime numbers, is one of the world's leading authorities on number theory and analysis. His work ranges from analytic number theory to algebra and algebraic geometry, and the partial differential equations of minimal surfaces. In the past decade, his main contributions have been in the active area of Diophantine approximation and Diophantine geometry, exploring questions on how to solve equations and inequalities in integers and rational numbers.

Faculty

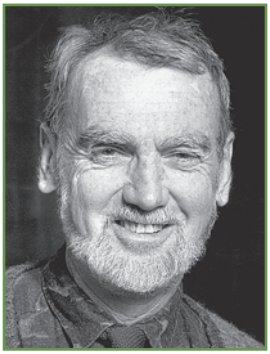


Pierre Deligne
Professor Emeritus

Pierre Deligne is known for his work in algebraic geometry and number theory. He pursues a fundamental understanding of the basic objects of arithmetical algebraic geometry—motive, L-functions, Shimura varieties—and applies the methods of algebraic geometry to trigonometrical sums, linear differential equations and their monodromy, representations of finite groups, and quantization deformation. His research includes work on Hilbert's twenty-first problem, Hodge theory, the relations between modular forms, Galois representations and L series, the theory of moduli, tannakian categories, and configurations of hyperplanes.

Phillip A. Griffiths
Professor Emeritus

Phillip Griffiths initiated with his collaborators the theory of variation of Hodge structure, which has come to play a central role in many aspects of algebraic geometry and its uses in modern theoretical physics. In addition to algebraic geometry, he has made contributions to differential and integral geometry, geometric function theory, and the geometry of partial differential equations. A former Director of the Institute (1991–2003), Griffiths chairs the Science Initiative Group, which fosters science in the developing world through programs such as the Carnegie-IAS African Regional Initiative in Science and Education.



Robert P. Langlands
Professor Emeritus

Robert Langlands's profound insights in number theory and representation theory include the formulation of general principles relating automorphic forms and algebraic number theory; the introduction of a general class of L-functions; the construction of a general theory of Eisenstein series; the introduction of techniques for dealing with particular cases of the Artin conjecture (which proved to be of use in the proof of Fermat's theorem); the introduction of endoscopy; and the development of techniques for relating the zeta functions of Shimura varieties to automorphic L-functions. Mathematicians have been working on his conjectures, the Langlands Program, for the last three decades. He has spent some of his time in recent years studying lattice models of statistical physics and the attendant conformal invariance.

Members and Visitors

Peter Albers
Symplectic Geometry, Hamiltonian Dynamical Systems · Purdue University · *vnf*
Funding provided by the National Science Foundation

Peter Albers is working on symplectic geometry and applications to Hamiltonian dynamical systems.

Noga Alon
Combinatorics · Tel Aviv University · *vp, f*
Funding provided by the National Science Foundation

Noga Alon is working on questions in discrete mathematics and theoretical computer science, focusing on problems in extremal and probabilistic combinatorics, information theory, combinatorial number theory, and discrete probability. He expects to combine combinatorial tools with algebraic and probabilistic techniques.

Dima Arinkin
Algebraic Geometry, Geometric Langlands Program · The University of North Carolina at Chapel Hill · *vnf*
Funding provided by the National Science Foundation

Dima Arinkin works on algebro-geometric questions motivated by the geometric Langlands program. He studies the moduli spaces of vector bundles (possibly with additional structures such as connections) on curves and the categories of sheaves on these spaces.

Costante Bellettini
Mathematics and Geometric Analysis · Institute for Advanced Study and Princeton University · *vri*

Costante Bellettini's research focuses on regularity questions in geometric measure theory. In particular, he is interested in calibrated currents and on the role that they play in several geometric problems, such as invariants of manifolds and gauge theory. Other topics that interest him include calculus of variations and elliptic partial differential equations.

Abed Bounemoura
Mathematical Physics · Institute for Advanced Study
Funding provided by the National Science Foundation

Abed Bounemoura is interested in the perturbation theory of integrable Hamiltonian systems. He plans to further investigate, theoretically and on concrete examples, the stability and instability properties of those systems.

f First Term · *s* Second Term · *m* Long-term Member · *v* Visitor
dvp Distinguished Visiting Professor · *vp* Visiting Professor
vri Veblen Research Instructorship · *vnf* von Neumann Fellowship

Members and Visitors

Barney Bramham
Symplectic Geometry · Institute for Advanced Study
Funding provided by the National Science Foundation

Barney Bramham will continue developing a new framework for studying the dynamics of area-preserving disc maps, using the theory of foliations by pseudoholomorphic curves. During his stay, he also hopes to learn more about such successful theories as those of Aubry-Mather and KAM.

David Brydges
Mathematical Physics · The University of British Columbia · *f*

David Brydges has recently been working on the asymptotics of the end-to-end distance of self-avoiding walks in four and more dimensions. He will use his time at the Institute to make progress on other approaches to the analysis of critical points, including the Sjoestrand Helffer convexity ideas used by Thomas Spencer.

Aynur Bulut
Partial Differential Equations, Harmonic Analysis · Institute for Advanced Study
Funding provided by the National Science Foundation

Aynur Bulut is working on problems concerning the local and global theory of nonlinear dispersive equations, particularly the nonlinear wave equation. She has developed an interest in the study of certain systems of infinitely many coupled partial differential equations arising in the derivation of dispersive equations from many-body quantum dynamics.

Francesco Cellarosi
Dynamical Systems, Number Theory · Institute for Advanced Study · *f*
Funding provided by the Giorgio and Elena Petronio Fellowship Fund and the National Science Foundation

Francesco Cellarosi is interested in limit theorems for dynamical systems of number theoretical origin, such as continued fractions and exponential sums, and their applications. In particular, he works on homogeneous dynamics for theta sums and correlations in quantum mechanical systems, and on a probabilistic model for square-free integers.

Yuri Chekanov
Symplectic Topology, Contact Topology · Moscow Center for Continuous Mathematical Education · *v, s*

Yuri Chekanov will continue studying classification problems for Lagrangian tori in symplectic manifolds such as complex vector spaces and complex projective spaces. He also plans to study the homotopy type of the space of contact structures, both tight and overtwisted, on three-manifolds such as the sphere, the torus, and the lens spaces.

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vri Veblen Research Instructorship · *vnf* von Neumann Fellowship

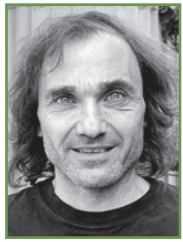
Members and Visitors

Weimin Chen

Differential Geometry and Topology · University of Massachusetts Amherst · *f*

Funding provided by the S. S. Chern Foundation for Mathematics Research Fund and the National Science Foundation

Weimin Chen's research focuses on the application of gauge theory and pseudoholomorphic curves to problems in low-dimensional topology or symplectic geometry.



Kai Cieliebak

Symplectic Geometry · Ludwig-Maximilians-Universität München · *v, s*

Kai Cieliebak's research interests lie in symplectic geometry and its interactions with other subjects such as Hamiltonian dynamics, complex geometry, and physics. Recently, his research has mostly been centered around the development of symplectic field theory. At the Institute, he plans to work on applications of symplectic techniques to classical questions in celestial mechanics and hydrodynamics.

Zsuzsanna Dancso

Quantum Algebra and Knot Theory · Institute for Advanced Study · *f*

Funding provided by the National Science Foundation

Zsuzsanna Dancso's research so far has focused on the connections between quantum algebra (Drinfel'd associators, quantum groups) and topology, more specifically knot theory (Kontsevich integral, finite type invariants). She has recently started learning about categorification and would like to explore more in this direction in the future.

Serguei Denissov

Analysis · University of Wisconsin–Madison · *f*

Funding provided by the National Science Foundation

Serguei Denissov's research in analysis is focused on linear partial differential equations (evolution equations, scattering theory), nonlinear partial differential equations in fluid dynamics (2D Euler and SQG), and some classical problems in the general theory of orthogonal polynomials along with various applications to mathematical physics and spectral theory.

Hakan Eliasson

Dynamical Systems · Institut de Mathématiques de Jussieu, Université Paris Diderot · *s*

Hakan Eliasson's research focuses on quasiperiodic dynamics and small-divisor problems; KAM and multiscale analysis in perturbation theory; Hamiltonian partial differential equations; and localization and diffusion in quasiperiodic Schrödinger operators.

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dvp Distinguished Visiting Professor · *vp* Visiting Professor
vri Veblen Research Instructorship · *vnf* von Neumann Fellowship

Members and Visitors

Alexander Felshtyn
Dynamical Systems, Topology, Group Theory · University of Szczecin · *s*

Alexander Felshtyn is interested in the relationship between Floer homology, Nielsen-Thurston theory, and a categorification of dynamical zeta functions. He is working also on twisted Burnside-Frobenius theory and groups with property R-infinity.

Daniel Fiorilli
Analytic Number Theory · Institute for Advanced Study
Funding provided by the National Science Foundation

During his stay at the Institute, Daniel Fiorilli is working on links between the following three entities: random matrix theory, the distribution of zeros of families of L-functions, and questions related to primes in arithmetic progressions and elliptic curves.

Nicola Gambino
Mathematical Logic and Theoretical Computer Science · Università degli Studi di Palermo · *f*
Funding provided by the National Science Foundation

Nicola Gambino's research focuses on mathematical logic and theoretical computer science. At the Institute, he plans to investigate further the connections between type theory and homotopy theory that have emerged in recent years, especially in connection with Vladimir Voevodsky's univalent foundations program.

David Geraghty
Number Theory · Institute for Advanced Study and Princeton University · *vri*

David Geraghty's research to date has been concerned with modularity of Galois representations, particularly modularity lifting and potential modularity. He plans to continue working on such questions as well as applications to proving instances of Serre type conjectures on the weights of mod p Galois representations.

Giambattista Giacomin
Applied Mathematics · Université Paris Diderot · *f*
Funding provided by the Giorgio and Elena Petronio Fellowship Fund

Giambattista Giacomin's research focuses on the role and the effect of disorder on the critical behavior of statistical mechanics systems. He aims at pursuing this research activity also in the direction of understanding some biological phenomena, like synchronization phenomena.

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dvp Distinguished Visiting Professor · *vp* Visiting Professor
vri Veblen Research Instructorship · *vnf* von Neumann Fellowship

Members and Visitors

Marian Gidea

Analysis · Northeastern Illinois University
Funding provided by the National Science Foundation

Marian Gidea works in dynamical systems with applications to celestial mechanics, mathematical physics, and mathematical biology. The main areas of his research are stability and instability in Hamiltonian systems, and the Arnold diffusion problem. He is planning to expand this work by using novel techniques from symplectic dynamics.

Viktor Ginzburg

Symplectic Geometry, Symplectic Topology, Dynamical Systems · University of California, Santa Cruz · *v, s*

Viktor Ginzburg's current work focuses on the existence (or nonexistence) of periodic orbits of general Hamiltonian systems, looked at from a symplectic topological perspective; the use of symplectic topological methods to study more specific systems; and the symplectic topology of coisotropic submanifolds.

Oded Goldreich

Theory of Computation · Weizmann Institute of Science · *v*

Oded Goldreich is interested in the interplay between randomness and computation, which is at the heart of modern cryptography and plays a fundamental role in the design of algorithms and in complexity theory at large. He is particularly interested in probabilistic proof systems, various notions of pseudorandomness, and sublinear-time algorithms.

Mark Goresky

Geometry, Automorphic Forms · Institute for Advanced Study · *m*
Funding provided by the Charles Simonyi Endowment

Mark Goresky's main interest this year concerns a book, written jointly with Jayce Getz (McGill University), on Hilbert modular forms with coefficients in intersection homology, generalizing some well-known classical results of Fritz Hirzebruch and Don Zagier.

Marcel Guardia

Dynamical Systems · Institute for Advanced Study · *s*
Funding provided by the National Science Foundation

Marcel Guardia is interested in Hamiltonian systems of both finite and infinite dimension, particularly the problem of Arnol'd diffusion and the exponentially small phenomena related to it in models coming from celestial mechanics. He also plans to work in the growth of Sobolev norms in some Hamiltonian partial differential equations.

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dvp Distinguished Visiting Professor · *vp* Visiting Professor
vri Veblen Research Instructorship · *vnf* von Neumann Fellowship

Members and Visitors

Mikko Haataja
Theoretical Materials Physics and Biophysics · Princeton University · *s*

Mikko Haataja works at the intersection between theoretical materials physics and biophysics. His research focuses on evolving microstructures in hard and soft matter systems, including structurally disordered metallic glasses and lipid bilayer membranes.

Dennis A. Hejhal
Analytic Number Theory and Automorphic Forms · University of Minnesota · *s*
The Bell Company Fellowship

Dennis Hejhal's recent research has focused on studying value distribution properties of general L-functions near the critical line Re(s)= 1/2 and utilizing those results to obtain information about the distribution of zeros of linear combinations of L-functions. At the Institute, he will also be continuing his work on the Selberg Archive Project.

Nancy Hingston
Differential Topology and Geometry · The College of New Jersey

Nancy Hingston's research concerns the interplay between Hamiltonian dynamics and the topology of loop spaces in Morse theory. While at the Institute, she plans to study resonance phenomena and the algebra of loop products.

Sonja Hohloch
Symplectic Geometry and Dynamical Systems · Institute for Advanced Study
Funding provided by the National Science Foundation

Sonja Hohloch is interested in symplectic geometry and dynamical systems, in particular Floer homology and its application to symplectic dynamics.

Umberto Leone Hryniewicz
Symplectic Geometry · Universidade Federal do Rio de Janeiro · *f*
Funding provided by the National Science Foundation

Umberto Hryniewicz has been studying global phenomena in Ham - iltonian dynamics using the theory of pseudoholomorphic curves in symplectic manifolds. For example, he is interested in the existence of global surfaces of section, dynamical characterizations of contact manifolds, and the existence of periodic orbits.

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Members and Visitors

Po Hu
Algebraic Topology · Wayne State University · *s*
Funding provided by the National Science Foundation

Po Hu's research areas include equivariant and motivic stable homotopy theory, as well as the mathematical foundations of string theory in physics. In particular, she is interested in conformal field theories and elliptic cohomology.

Russell Impagliazzo
Computational Complexity · University of California, San Diego · *vp*
Funding provided by the Oswald Veblen Fund and the National Science Foundation

Russell Impagliazzo specializes in computational complexity, the role of randomness in computation, proof complexity, average-case complexity, the foundations of cryptography, and the exact complexity of NP-complete problems.

Tasho Kaletha
Group Theory, Automorphic Forms · Institute for Advanced Study and Princeton University · *vri*

Tasho Kaletha's main research interests include the stable topological trace formula on the one hand, and the local Langlands correspondence and endoscopy for p-adic groups on the other hand. Another of his interests is the asymptotic behavior of divisibility functions for arithmetic groups. Currently, he is focusing on endoscopic character identities for L-packets on p-adic groups.

Vadim Kaloshin
Hamiltonian Dynamics and Celestial Mechanics · The Pennsylvania State University · *s*
Funding provided by the National Science Foundation

Vadim Kaloshin's research concerns stabilities versus instability in Hamiltonian systems and celestial mechanics, as well as Aubry-Mather theory, weak KAM theory, and the Hamilton-Jacobi equation with applications to Arnold diffusion, and planar billiards in convex domains.

Michael Khanevsky
Symplectic Geometry and Dynamics · Institute for Advanced Study
Funding provided by the National Science Foundation

Michael Khanevsky's research is concentrated on Hofer's geometry and on symplectic invariants coming from Floer and symplectic homology. He will participate in the special year for symplectic dynamics.

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dvp Distinguished Visiting Professor · *vp* Visiting Professor
vri Veblen Research Instructorship · *vnf* von Neumann Fellowship

Members and Visitors

Boris Khesin
Topological Hydrodynamics, Infinite-Dimensional Groups, Integrable Systems · University of Toronto · *s*
Funding provided by the Charles Simonyi Endowment

Boris Khesin's research focuses on the geometry of various infinite-dimensional groups and related Hamiltonian systems, geometric methods in completely integrable systems, and topological and group-theoretical approaches to hydrodynamics and optimal mass transport via the study of the geometry of diffeomorphism groups.

Swastik Kopparty
Theoretical Computer Science · Rutgers, The State University of New Jersey · *v*

Within theoretical computer science, Swastik Kopparty is interested in coding theory, pseudorandomness, and complexity theory. While at the Institute, he plans to think about ways we can cope with, benefit from, and understand randomness in computation.

Igor Kriz
Algebra · University of Michigan · *s*
Funding provided by the James D. Wolfensohn Fund

Igor Kriz works in algebra and algebraic topology, on subjects related to K-theory and equivariant and algebraic homotopy theory, as well as conformal field theory and vertex algebras.

Kai-Wen Lan
Number Theory, Shimura Varieties · Institute for Advanced Study and Princeton University · *v*

Kai-Wen Lan plans to study cohomologies of Shimura varieties and related locally symmetric spaces with methods related to arithmetic toroidal compactifications. One of his aims is to understand relations between automorphic forms coming from geometric objects of very different natures.

Menachem (Emanuel) Lazar
Mathematical Physics · Institute for Advanced Study
Funding provided by the National Science Foundation

Menachem Lazar's work focuses on the evolution and long-term steady states of dynamical cell structures, in particular those that evolve via mean curvature flow. This work has important consequences in the understanding of polycrystalline materials.

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vri Veblen Research Instructorship · *vnf* von Neumann Fellowship

Members and Visitors

Anthony Michael Licata
Representation Theory · Institute for Advanced Study
Funding provided by the National Science Foundation

Anthony Licata works in geometric representation theory and categorification. In particular, he is interested in representation-theoretic constructions in algebraic/symplectic geometry and the categorifications arising from these constructions.

Joan E. Licata
Topology and Contact Geometry · Institute for Advanced Study
Funding provided by the National Science Foundation

Joan Licata's research focuses on invariants of knots and three-manifolds, with a particular emphasis on contact geometry and Heegaard Floer theory. During her time at the Institute, she plans to study constructions coming from symplectic field theory.

Victor Daniel Lie
Analysis · Institute for Advanced Study and Princeton University · *vri*

Victor Lie's main area of interest is harmonic analysis. More specifically, his work has developed in the subfields of time-frequency analysis and subjects related to the Kakeya problem. Additionally, he plans to explore the rich connections between harmonic analysis and ergodic theory, partial differential equations, and additive combinatorics.

László Lovász
Discrete Mathematics, Theoretical Computer Science · Eötvös Loránd University · *vp*
Neil Chriss and Natasha Herron Chriss Founders' Circle Visiting Professor; additional funding provided by the National Science Foundation

László Lovász is interested in connections between discrete mathematics and other branches of mathematics. In recent years, he has been interested in a theory of very large graphs and limits of growing graph sequences.

Shachar Lovett
Computer Science · Institute for Advanced Study
Funding provided by the National Science Foundation

Shachar Lovett is interested in all aspects of theoretical computer science, particularly computational complexity, pseudorandomness, coding theory, algebraic constructions, and lower bounds. He is also interested in additive combinatorics and its connections to theoretical computer science.

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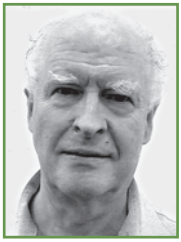
Members and Visitors



John Mather
Hamiltonian Dynamics · Princeton University
Funding provided by the Ambrose Monell Foundation

John Mather is working on questions relating to Arnold diffusion. He hopes to finish writing up results concerning the existence of diffusing orbits in two and one half degrees of freedom. In addition, he expects to work on open problems concerning the existence of area-preserving mappings with positive metric entropy.

Benjamin Matschke
Algebraic Topology, Discrete Geometry · Institute for Advanced Study
Funding provided by the National Science Foundation

Benjamin Matschke uses equivariant topology to study discrete geometry problems with natural symmetries, such as Tverberg-type partition problems. At the Institute, he wants to extend the machinery to quantitative settings in order to apply it to Ramsey theory, enumerative combinatorics, and possibly number theory.

Chen Meiri
Group Theory · Institute for Advanced Study
Funding provided by the National Science Foundation

Chen Meiri's research focuses on determining the density of subsets of finitely generated groups. The main tools for this study come from finite and algebraic group theory, number theory, and additive combinatorics.

Raghu Meka
Theoretical Computer Science · Institute for Advanced Study
Funding provided by the National Science Foundation

Raghu Meka's main interests are in complexity theory, pseudo - randomness, and algorithms. More generally, he is interested in probability- and combinatorics-related problems.

Roman Mikhailov
Algebra, Topology · Institute for Advanced Study · *vnf*
Funding provided by the National Science Foundation

Roman Mikhailov's research interests include derived functors of nonadditive functors and their application to homotopy theory, homotopy groups of spheres, group and group ring theory, algebraic K-theory, and homotopical algebra.

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Members and Visitors

Gerard Misiolek
Global Analysis, Partial Differential Equations · University of Notre Dame
Friends of the Institute for Advanced Study Member; additional funding provided by the James D. Wolfensohn Fund

Gerard Misiolek's main interests are in analysis and geometry of nonlinear partial differential equations arising in fluid dynamics, groups of diffeomorphisms, and infinite-dimensional Hamiltonian systems.

Ankur Moitra
Computer Science · Institute for Advanced Study
Funding provided by the National Science Foundation

Ankur Moitra will work on questions in theoretical computer science. In particular, he is interested in applying mathematical tools to problems in algorithms and learning theory.

Jelani Nelson
Theoretical Computer Science · Institute for Advanced Study · *v*

Jelani Nelson is working to develop algorithms for processing massive amounts of data, and specifically algorithms that use very little memory and require only one pass over the data (so-called streaming algorithms).

Alexandru Oancea
Differential Geometry · CNRS and Université de Strasbourg
Funding provided by the National Science Foundation

Alexandru Oancea's field of research is symplectic and contact geometry, with an emphasis on symplectic invariants constructed from pseudoholomorphic curves. He is currently interested in the symplectic topology of Stein manifolds, which he plans to study using ideas from low-dimensional topology and singularity theory.

Yong-Geun Oh
Symplectic Geometry, Mathematical Physics · University of Wisconsin–Madison · *s*

Yong-Geun Oh's current interests include symplectic topology and Hamiltonian dynamics up to the continuous category; Floer homology theory, both in closed and open string contexts and their applications to symplectic topology and mirror symmetry; and analysis of degenerate pseudoholomorphic curves in various contexts of symplectic, contact geometry and open Gromov-Witten theory.

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Members and Visitors

Alvaro Pelayo
Symplectic Geometry, Special Theory of Integrable Systems · Institute for Advanced Study
Funding provided by the National Science Foundation

Alvaro Pelayo is researching completely integrable systems, Hamiltonian dynamics and symplectic geometry, and geometric aspects of partial differential equations.

Gopal Prasad
Lie Groups, Algebraic Groups, Arithmetic Groups · University of Michigan · *s*

Gopal Prasad works on Lie and algebraic groups, arithmetic groups, geometry of locally symmetric spaces, and the representation theory of reductive p-adic groups.

Julia Ruscher
Probability Theory · Institute for Advanced Study · *v*

Julia Ruscher is interested in path properties of Brownian motion with drift and Hausdorff dimension of random fractal sets.

Sheila Sandon
Symplectic and Contact Topology · Institute for Advanced Study · *s*
Funding provided by the National Science Foundation

Sheila Sandon's research interests are in symplectic and contact topology. In particular, she applies classical Morse theory to generating functions of Legendrian submanifolds to study global rigidity phenomena in contact topology.

Shubhangi Saraf
Complexity Theory, Pseudorandomness · Institute for Advanced Study
Funding provided by the National Science Foundation

Shubhangi Saraf's research focuses on complexity theory and pseudorandomness.

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Members and Visitors

Grant Schoenebeck
Theoretical Computer Science · Institute for Advanced Study · *v*

Grant Schoenebeck is interested in computational complexity theory and the intersection of computer science, social networks, and economics.

Mira Shamis
Mathematical Physics · Institute for Advanced Study
Funding provided by the National Science Foundation

Mira Shamis is currently interested in the spectral theory of Jacobi operators, particularly operators with periodic and almost periodic potentials.

Alexander Shnirelman
Fluid Dynamics, Geometry, Dynamical Systems · Concordia University, Montreal
AMIAS Member; additional funding provided by the Charles Simonyi Endowment

Alexander Shnirelman studies dynamics of ideal incompressible fluid in connection with the geometry of infinite-dimensional groups and dynamical systems. He plans to write a book during his stay at the Institute.

Anders Södergren
Number Theory · Institute for Advanced Study
Funding provided by the National Science Foundation

Anders Södergren works in analytic number theory and dynamical systems on homogeneous spaces. While at the Institute, he plans to address questions about the geometry of numbers and automorphic functions in high dimension.

Sasha Sodin
Mathematical Physics · Institute for Advanced Study
Funding provided by the National Science Foundation

Sasha Sodin works on random matrices. He is currently trying to study the local spectral properties of band matrices using a perturbation expansion.

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Members and Visitors

Srikanth Srinivasan
Computational Complexity · Institute for Advanced Study · *v*

Srikanth Srinivasan's research is mainly focused on topics in computational complexity, particularly on problems motivated by questions in arithmetic and boolean circuit complexity and pseudorandomness.

Nikhil Srivastava
Theoretical Computer Science · Institute for Advanced Study · *v, s*

Nikhil Srivastava is interested in spectral graph theory and linear algebra. He is working on problems regarding cuts and distances in spanning trees of graphs, and on constructing matrices with various kinds of desirable spectral properties.

Andrew Stimpson
Algebraic Topology · Institute for Advanced Study
Funding provided by the National Science Foundation

Andrew Stimpson is interested in differential cohomology and how it relates to physics. He seeks to answer how higher categories can be used to classify multiplicative differential cohomology theories and what this implies for the string theory, in which they have applications.

Andras Istvan Stipsicz
Topology, Low-Dimensional Topology · Alfréd Rényi Institute of Mathematics, Hungarian Academy of Sciences, Budapest
Funding provided by the National Science Foundation

At the Institute, Andras Stipsicz plans to continue research in three-dimensional contact topology, and its relation to Heegaard Floer theory. Parallel to these studies, he also plans to classify surface singularities with smoothings of simple topological properties and use these results to understand exotic smooth structures on closed 4-manifolds with small Euler characteristic.

Balazs Szegedy
Limits of Discrete Structures · University of Toronto · *vnf, f; v, s*
Funding provided by the National Science Foundation

In the frame of a limit theory, very large discrete structures are viewed as approximations of infinite measurable objects. Ergodic theory, graph limit theory, and higher-order Fourier analysis can all be described as limit theories. Balazs Szegedy's recent research is in this area.

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Members and Visitors

Christine J. Taylor
Evolutionary Game Theory, Evolution of Cooperation · Institute for Advanced Study and Princeton University

Christine Taylor is studying the act of cooperation, which is abundant in nature ranging from microbial colonies to animal and human societies. She is investigating different mechanisms for the evolution of cooperation, a conundrum and a central pillar of evolutionary biology, under deterministic and stochastic game dynamics.

Richard Taylor
Number Theory · Harvard University · *dvp, f*

Richard Taylor, with his collaborators, has developed powerful new techniques for use in solving longstanding problems, including the Shimura-Taniyama conjecture, the local Langlands conjecture and the Sato-Tate conjecture. Currently, Taylor is interested in the relationship between l-adic representations for automorphic forms—how to construct l-adic representations for automorphic forms and how to prove given l-adic representations that arise in this way.

Mohammad Farajzadeh Tehrani
Sympletic Geometry · Institute for Advanced Study · *v*

Mohammad Tehrani's research is focused on the symplectic geometry aspects of Calabi-Yau threefolds. He studies these objects from the point of view of Gromov-Witten theory, Floer theory, and in general any subject which is related to A-side of mirror symmetry.

Mina Teicher
Algebraic Geometry · Bar-Ilan University
Funding provided by the Oswald Veblen Fund

Mina Teicher is interested in line arrangements, the structure of the braid group, and its application to cryptography. In parallel, she is interested in neural computations (including methods from geometry, graph theory, and statistics) for theoretical questions as well as brain imaging for applications to epilepsy and depression.

Karen Uhlenbeck
Gauge Theory · The University of Texas at Austin · *vp, s*
The Robert and Luisa Fernholz Visiting Professor; additional funding provided by the Oswald Veblen Fund

Karen Uhlenbeck primarily works in the area of geometric partial differential equations. She has worked in the areas of the calculus of variations, minimal surfaces, harmonic maps, gauge theory, and integ - rable systems. She is currently interested in flat complex connections and moduli spaces of geometric structures on complex connections.

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Members and Visitors

Adrian Vasiu
Number Theory · Binghamton University, The State University of New York · *f*

Adrian Vasiu is working toward finalizing two books and getting feedback on them. He is also restarting his work on the Mumford-Tate conjecture, as well as refreshing and improving his knowledge of the Tate and Hodge conjecture for abelian varieties over finite fields and number fields (respectively).

Vera Vértesi
3- and 4-Manifold Invariant · Institute for Advanced Study · *v, f*

Vera Vértesi is working on low-dimensional topology. In particular, she is interested in Legendrian and transverse knots, and knot invariants coming form the recently defined Heegaard Floer homologies. She is currently trying to give gluable, completely combinatorial description of a tangle invariant in Heegaard Floer homology.

Katalin Vesztergombi
Graph Theory, Combinatorial Geometry · Eötvös Loránd University

One of Katalin Vesztergombi's interests is combinatorial properties of distance graphs of planar point sets. In recent years, she has worked in the theory of limits of graph sequences.

Rafael von Känel
Number Theory · Institute for Advanced Study
Funding provided by the National Science Foundation

Rafael von Känel works in number theory, in particular in Diophantine geometry. He is interested in problems arising in the context of the abc conjecture and the effective Mordell conjecture.

Fang Wang
Microlocal Analysis, Geometric Scattering Theory, General Relativity, Partial Differential Equations · Institute for Advanced Study and Princeton University · *vri*
Funding provided by the National Science Foundation

Fang Wang is currently working on the asymptotic behavior of solutions to Einstein vacuum equations by applying the geometric scattering theory.

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Members and Visitors

Michael A. Warren
Computer Science, Homotopy Theory · Institute for Advanced Study
Funding provided by the National Science Foundation

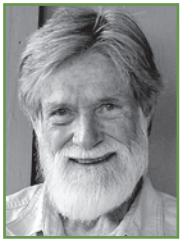
Michael Warren's research is in logic, higher-dimensional category theory, and homotopy theory. He is particularly interested in connections between these areas, and he will take part in the development of Voevodsky's univalent foundations during his time at the Institute. He is also interested in stacks and nonabelian cohomology.

Katrin Wehrheim
Symplectic Geometry, Low-Dimensional Topology, Gauge Theory · Massachusetts Institute of Technology · *vnf*
Funding provided by the National Science Foundation

Katrin Wehrheim plans to learn more about dynamics; think about nonsqueezing in symplectic Hilbert spaces; develop a theory of holomorphic curves in symplectic Hilbert spaces that may help with the first two items; and turn a lot of drafts (on pseudoholomorphic quilts and their topological applications) into papers.

Anna Wienhard
Geometry · Princeton University · *v*

Anna Wienhard plans to investigate higher Teichmüller spaces. Many potentially interesting structures are yet to be discovered for higher Teichmüller spaces and the relation to the moduli space of Riemann surfaces still needs to be clarified.



Robert F. Williams
Topology, Dynamical Systems · The University of Texas at Austin · *s*

Robert Williams is a topologist working specifically in dynamical systems. Recently, he has worked in tiling theory. This, and perhaps some work in knotted periodic orbits of ordinary differential equations in three dimensions, will probably be his concern while at the Institute.

Gisbert Wüstholz
Number Theory, Transcendence Theory · Eidgenössische Technische Hochschule Zürich · *f*

Gisbert Wüstholz will continue to work on an adelic extension of Baker's theory, one of the basic techniques in transcendence theory, in which there will be no multiplicity estimates any longer. A second research topic will deal with a 1-motive version of the Kontsevich conjecture on periods.

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Members and Visitors

Kris Wysocki
Symplectic Geometry, Contact Geometry, Hamiltonian Dynamics · The Pennsylvania State University
Funding provided by the Ellentuck Fund

Kris Wysocki is working on a polyfold theory and a generalized Fredholm theory on polyfolds. At the Institute, he plans to work on applications of polyfold theory to the Gromov-Witten theory and the symplectic field theory.

Eduard Zehnder
Mathematics, Dynamical Systems, Symplectic Geometry · Eidgenössische Technische Hochschule Zürich
Funding provided by the Charles Simonyi Endowment

Eduard Zehnder's fields of interest are dynamical systems, in particular, Hamiltonian systems and symplectic geometry. He is working jointly with Helmut Hofer and Kris Wysocki to establish the mathematical foundations of the symplectic field theory.

Ke Zhang
Dynamical Systems · Institute for Advanced Study · *s*
Funding provided by the National Science Foundation

Ke Zhang is interested in the stability and instability of Hamiltonian systems, in particular, the question of Arnold diffusion. He plans to work on questions concerning generic Arnold diffusion and speed of Arnold diffusion, using variational methods started by Mather.

Aleksey Zinger
Symplectic Topology and Algebraic Geometry · Stony Brook University, The State University of New York
Funding provided by the National Science Foundation

Aleksey Zinger's research primarily concerns Gromov-Witten invariants and is often motivated by predictions arising from string theory. While at the Institute, he plans to focus on studying analytic properties of pseudoholomorphic maps with an eye toward applications in Gromov-Witten theory and elsewhere in symplectic topology.

David Zuckerman
Computer Science · The University of Texas at Austin
Funding provided by the National Science Foundation

David Zuckerman's research focuses on the role of randomness in computation, especially pseudorandomness and randomness extraction. He is also interested in coding theory, cryptography, approximability, and other aspects of computational complexity.

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School of Natural Sciences

Administrative Officer: Michelle Sage

Executive Director and Administrator,
The Simons Center for Systems Biology: Suzanne P. Christen

The School of Natural Sciences, established in 1966, provides a unique atmosphere for research in broad areas of theoretical physics, astronomy, and systems biology.

Areas of current interest in theoretical physics include elementary particle physics, particle phenomenology, string theory, and quantum theory and quantum gravity and their relationship to geometry. The astrophysics group combines theory with modern observational studies to understand a wide variety of astrophysical phenomena. The research in mathematical physics and string theory benefits from synergistic collaborations with the School of Mathematics. The programs in physics and astronomy are closely integrated with corresponding activities at Princeton University via joint seminars and lunches, as well as frequent informal contacts.

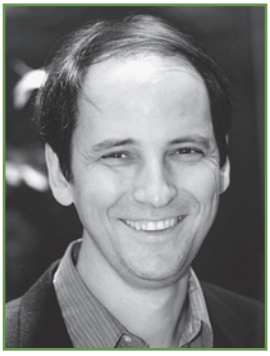
The Simons Center for Systems Biology takes an interdisciplinary approach to biology, conducting research at the interface of molecular biology and the physical sciences and drawing researchers from an array of disciplines, including mathematics, physics, astrophysics, molecular biology, and chemistry. The Center encourages collaborations with other academic and clinical groups as well as with research scientists from pharmaceutical, biotechnology, and computer companies, to pool biological data and to confirm theoretical models. The Center hosts a variety of joint "lab meetings," seminars, symposia, and public lectures that take place during the year.

The School also sponsors Prospects in Theoretical Physics, a two-week residential summer program held at the Institute for promising graduate students and postdoctoral scholars, who attend lectures and sessions on the latest advances and open questions in the field of theoretical physics.

Faculty

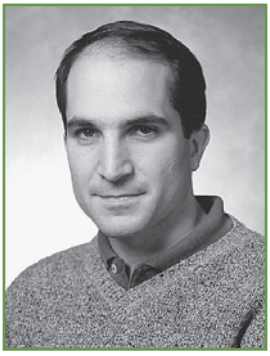
Nima Arkani-Hamed
Professor · Particle Physics

One of the leading particle physics phenomenologists of his generation, Nima Arkani-Hamed is concerned with the relation between theory and experiment. His research has shown how the extreme weakness of gravity, relative to other forces of nature, might be explained by the existence of extra dimensions of space, and how the structure of comparatively low-energy physics is constrained within the context of string theory. He has taken a lead in proposing new physical theories that can be tested at the Large Hadron Collider at CERN in Switzerland.



Stanislas Leibler
Professor · Biology

Stanislas Leibler has made important contributions to theoretical and experimental biology, successfully extending the interface between physics and biology to develop new solutions and approaches to problems. Interested in the quantitative description of microbial systems, both on cellular and population levels, Leibler is developing the theoretical and experimental methods necessary for studying the collective behavior of biomolecules, cells, and organisms. By selecting a number of basic questions about how simple genetic and biochemical networks function in bacteria, he and his laboratory colleagues are beginning to understand how individual components can give rise to complex, collective phenomena.



Juan Maldacena
Professor · Theoretical Physics

Juan Maldacena's work focuses on quantum gravity, string theory, and quantum field theory. He has proposed a relationship between quantum gravity and quantum field theories that elucidates various aspects of both theories. He is studying this relationship further in order to understand the deep connection between black holes and quantum field theories, and he is also exploring the connection between string theory and cosmology.

Faculty

Nathan Seiberg

Professor · Mathematical Physics

Nathan Seiberg's research focuses on various aspects of string theory, quantum field theory, and particle physics. His work has shed light on the worldsheet description of string theory as a two-dimensional conformal field theory and its space-time manifestations. Seiberg has contributed to the understanding of the dynamics of quantum field theories, especially supersymmetric quantum field theories. His exact solutions of such theories have uncovered many new and unexpected insights, including the fundamental role of electric-magnetic duality in these theories. These exact solutions have led to many applications in physics and in mathematics. He has also clarified how supersymmetry can be dynamically broken, and has explored the phenomenological consequences of supersymmetry breaking. These consequences will be tested at the Large Hadron Collider.

Scott Tremaine

Richard Black Professor · Astrophysics

Scott Tremaine has made seminal contributions to understanding the formation and evolution of planetary systems, comets, black holes, star clusters, galaxies, and galaxy systems. He predicted the Kuiper belt of comets beyond Neptune and, with Peter Goldreich (Professor Emeritus, School of Natural Sciences), the existence of shepherd satellites and density waves in Saturn's ring system, as well as the phenomenon of planetary migration. He interpreted double-nuclei galaxies, such as the nearby Andromeda galaxy, as eccentric stellar disks, and elucidated the role of dynamical friction in galaxy evolution.

Edward Witten

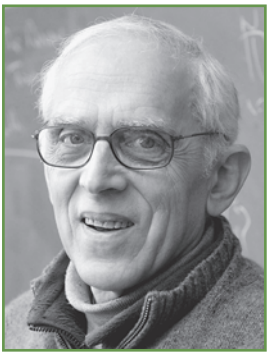
Charles Simonyi Professor · Mathematical Physics

Edward Witten's work exhibits a unique combination of mathematical power and physics insight, and his contributions have significantly enriched both fields. He has greatly contributed to the modern interest in superstrings as a candidate theory for the unification of all known physical interactions. Most recently, he has explored quantum duality symmetries of field theories and string theories, opening significant new perspectives on particle physics, string theory, and topology.

Faculty

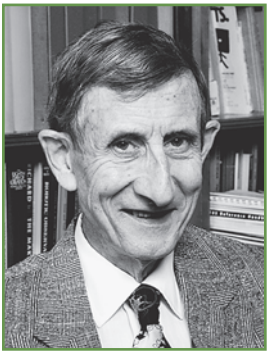
Matias Zaldarriaga
Professor · Astrophysics and Cosmology

Matias Zaldarriaga has made many influential and creative contributions to our understanding of the early universe, particle astrophysics, and cosmology as a probe of fundamental physics. Much of his work centers on understanding the clues about the earliest moments of our universe encoded in the Cosmic Microwave Background, the faint glow of radiation generated by the Big Bang. His recent research has focused on intergalactic hydrogen gas in the early universe, and he is at the forefront of developing machinery to study this gas using the spectral line from neutral hydrogen at 21-centimeter wavelength.



Stephen L. Adler
Professor Emeritus · Particle Physics

In a series of remarkable, difficult calculations, Stephen Adler demonstrated that abstract ideas about the symmetries of fundamental interactions could be made to yield concrete predictions. The successful verification of these predictions was a vital step toward the modern Standard Model of particle physics. In some of his more recent work, he has been exploring generalized forms of quantum mechanics, both from a theoretical and a phenomenological standpoint. He is currently developing new algorithms for multi-dimensional numerical integration.



Freeman J. Dyson
Professor Emeritus · Mathematical Physics and Astrophysics

Freeman Dyson's work on quantum electrodynamics marked an epoch in physics. The techniques he used in this domain form the foundation for most modern theoretical work in elementary particle physics and the quantum many-body problem. He has made highly original and important contributions to an astonishing range of topics, from number theory to adaptive optics. His current research tries to answer the question of whether any conceivable thought-experiment could detect a single graviton.

Faculty

Peter Goldreich

Professor Emeritus · Astrophysics

Peter Goldreich has made profound and lasting contributions to planetary science and astrophysics, providing fundamental theoretical insights for understanding the rotation of planets, the dynamics of planetary rings, pulsars, astrophysical masers, the spiral arms of galaxies, oscillations of the sun and white dwarfs, turbulence in magnetized fluids, and planet formation. His current research is focused on the production of impact spherules.

Arnold J. Levine

Professor Emeritus · Biology

Arnold Levine is a widely acclaimed leader in cancer research. In 1979, Levine and others discovered the p53 tumor suppressor protein, a molecule that inhibits tumor development. He established and heads the Simons Center for Systems Biology at the Institute, which concentrates on research at the interface of molecular biology and the physical sciences: on genetics and genomics, polymorphisms and molecular aspects of evolution, signal transduction pathways and networks, stress responses, and pharmacogenomics in cancer biology.

Members and Visitors

Yacine Ali-Haïmoud
Theoretical Astrophysics, Cosmology · Institute for Advanced Study
Funding provided by the National Science Foundation

Yacine Ali-Haïmoud has worked on the physics of dust grains in the interstellar medium and the primordial recombination of hydrogen. At the Institute, he plans on exploring new areas of theoretical astrophysics and cosmology such as gravity theories and the reionization epoch.

Katrin Becker
String Theory, Particle Physics, Cosmology · Texas A&M University · *f*
Funding provided by the Ambrose Monell Foundation

Katrin Becker's research deals with fundamental aspects of string theory. In recent years, her work has focused on proving the existence and studying the geometric properties of corresponding mathematical spaces in string theory. The properties of the vast majority of mathematical spaces, the so-called torsional spaces, are still to be uncovered.

Vladimir Belyi
Biology · The Cancer Institute of New Jersey · *v*

Vladimir Belyi is interested in the study of genome evolution, structure-sequence relation, and optimization of genomic code. While at the Institute, he will be working on combining tools of statistical mechanics and comparative genomics to test for novel gene functions, look for pressures associated with genetic drift, and study evolution of the transcriptional regulation.

Simeon Paul Bird
Cosmology · Institute for Advanced Study
Funding provided by the National Science Foundation

Simeon Bird's research focuses on the early universe and the intergalactic medium. He works on simulations of the Lyman-alpha and of the matter power spectrum, focusing on the impact of cosmological parameters. He is also interested in inflation.

Kfir Blum
Particle and Astroparticle Physics · Institute for Advanced Study
Funding provided by the United States Department of Energy

Kfir Blum's areas of interest include particle physics, in particular supersymmetry and Higgs physics; cosmological problems, such as dark matter and the baryon asymmetry of the universe; cosmic ray physics; and indirect astrophysical probes for dark matter.

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v Visitor · *vp* Visiting Professor

Members and Visitors

Jo Bovy
Cosmology, Astrophysics · Institute for Advanced Study
Space Telescope Science Institute Hubble Fellow

Jo Bovy works on various topics in astrophysics and cosmology. He is particularly interested in the formation and evolution of galaxies. While at the Institute, he will study the dynamics and structure of the Milky Way.

Curtis Callan
Biology · Princeton University · *v*

Curtis Callan is a theoretical physicist with broad interests in quantum field theory and statistical physics. He is currently working on problems in biology, with a focus on gene regulation: how it works mechanistically, how it manages to achieve rather precise results in the face of noise, and how it evolved (and evolves).

Simon Caron-Huot
Mathematical Physics, Statistical Mechanics, String Theory, Supersymmetry · Institute for Advanced Study
Marvin L. Goldberger Member; additional funding provided by the National Science Foundation

Simon Caron-Huot is studying very hot and dense systems, such as the quark-gluon plasma, and is also interested in gravitational, especially black hole, physics.

Nathaniel Craig
Particle Physics · Institute for Advanced Study
Funding provided by the National Science Foundation

Nathaniel Craig's research concerns high-energy theoretical physics. He is principally interested in studying connections between quantum field theory, string theory, and particle phenomenology, with an eye toward their potential experimental signatures.

Tudor Dan Dimofte
Mathematical and Particle Physics · Institute for Advanced Study · *f*
Friends of the Institute for Advanced Study Member; additional funding provided by the United States Department of Energy

Tudor Dimofte studies various topics in string theory and quantum field theory, ranging from quantum states of black holes to dynamics of gauge theories. He is interested in building new, mutually beneficial connections between physics and mathematics, especially in the fields of algebraic geometry and knot theory.

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v Visitor · *vp* Visiting Professor

Members and Visitors

Subo Dong
Astrophysics · Institute for Advanced Study
NASA Exoplanet Institute Carl Sagan Fellowship Program

Subo Dong works on extrasolar planet searches with gravitational microlensing. While at the Institute, he plans to develop new numerical techniques for interpreting microlensing observations, as well as explore the frequency and distribution of planets. He also hopes to study other areas of astrophysics, with an emphasis on dynamics.

Nicholas Dorey
Quantum Field Theory, String Theory · University of Cambridge · *s*
Funding provided by the Ambrose Monell Foundation

Nicholas Dorey is currently interested in understanding the consequences of integrability in planar gauge theories and in their dual string theory descriptions. A particular goal is to understand the quantization of string theory in backgrounds with constant curvature in which classical string motion is integrable.

Cora Dvorkin
Cosmology, Astrophysics · Institute for Advanced Study
Funding provided by the National Science Foundation

Cora Dvorkin's research focuses on connecting ideas in theoretical physics to observable phenomena in cosmology. She is interested in a wide range of topics in theoretical cosmology, including inflation and its imprints in the cosmic microwave background, reionization, models of dark matter and methods to test them, and dark energy.

Anatoly Dymarsky
Cosmology, String Theory, Supersymmetry, Particle Physics · Institute for Advanced Study
Frank and Peggy Taplin Member; additional funding provided by the United States Department of Energy

Anatoly Dymarsky's research is focused on the gauge/string theory correspondence that provides a novel approach to address long-standing open questions in field theory. He will apply this approach to contemporary problems of cosmology and particle physics.

Rouven Essig
Particle Physics · Stanford University · *v*

Over the next few years, data from various experiments may teach us the identity of the dark matter particle and uncover new fundamental particles, forces, and symmetries of nature. Rouven Essig's research will focus on the implications of this data for physics beyond the Standard Model and also explore new experimental probes for new physics.

f First Term · *s* Second Term · *m* Long-term Member
v Visitor · *vp* Visiting Professor

Members and Visitors

Rodrigo Fernandez
Astrophysics · Institute for Advanced Study
NASA Einstein Fellowship Program

Rodrigo Fernandez is interested in theoretical astrophysics at the stellar scale, with a focus on using numerical simulations to understand complex systems. His current research topics include the explosion mechanism of core-collapse supernovae and the physics of neutron stars.

Guido Festuccia
High-Energy Theoretical Physics · Institute for Advanced Study
Funding provided by the National Science Foundation

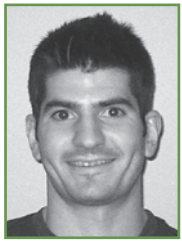
Guido Festuccia's primary interest is quantum field theory. Recently, he has worked on supersymmetry, its breaking, and applications to particle-physics phenomenology. He also plans to study the correspondence between string and gauge theory, particularly its consequences for black hole physics.

Raphael Flauger
Theoretical Physics · Institute for Advanced Study
Funding provided by the National Science Foundation

Raphael Flauger's research interests range from phenomenological questions in cosmology and particle physics to formal questions in quantum field theory and string theory. He is currently particularly interested in extracting clues about fundamental physics from cosmological observations.

Davide Gaiotto
Particle Physics · Institute for Advanced Study · *m*
Roger Dashen Member; additional funding provided by the National Science Foundation

The semiclassical description of black holes in quantum gravity predicts some surprising facts and some sharp contradictions. String theory potentially provides a detailed explanation of both. At the Institute, Davide Gaiotto will continue his work on black hole physics and join the investigations of the surprising connections to field theory.



Daniel Green
Cosmology, String Theory, Supersymmetry, Phenomenology, Mathematical Physics, Statistical Mechanics · Institute for Advanced Study
Martin A. and Helen Chooljian Member; additional funding provided by the United States Department of Energy

Daniel Green is interested in both the formal developments of quantum field theory and string theory and their connections to particle physics and cosmology. He is currently interested in nonperturbative solutions to theoretical problems in both particle physics and cosmology.

f First Term · *s* Second Term · *m* Long-term Member
v Visitor · *vp* Visiting Professor

Members and Visitors

Benjamin Greenbaum
Biology · Institute for Advanced Study · *m*
Eric and Wendy Schmidt Member in Biology

Benjamin Greenbaum will be working on patterns in the evolution of viruses and how those patterns relate to host biology. Specifically, he is interested in using viruses to better understand the innate immune system.

Daniel Grin
Cosmology, Theoretical Astrophysics · Institute for Advanced Study
Funding provided by NASA; additional funding provided by the National Science Foundation

Daniel Grin is interested in a variety of topics in theoretical cosmology, including cosmological recombination, inflationary perturbations, the cosmic microwave background more generally, axions, dark matter halo profiles, nonstandard thermal histories for the early universe, modifications to general relativity, gravitational lensing, and Lyman limit absorbers.

Thomas Hartman
Particle Physics, String Theory · Institute for Advanced Study
Funding provided by the United States Department of Energy

Thomas Hartman's research is on string theory, black holes, and the holographic correspondence relating quantum gravity to gauge theory. He is interested in both theoretical and phenomenological questions in quantum gravity.

Jonathan Jacob Heckman
String Theory, Phenomenology · Institute for Advanced Study
William D. Loughlin Member; additional funding provided by the National Science Foundation

Jonathan Heckman's research concerns high-energy theoretical physics. He is interested in both formal and phenomenological aspects of string theory, particle physics, and cosmology, as well as potential interrelations between these areas.

Tobias Heinemann
Astrophysics · Institute for Advanced Study
IBM Einstein Fellow

Tobias Heinemann's research interests are broadly in the field of astrophysical fluid dynamics. During his stay at the Institute, he intends to further the understanding of, among other things, wave dynamics and dynamo processes in accretion discs, and will do so from an applied mathematics perspective.

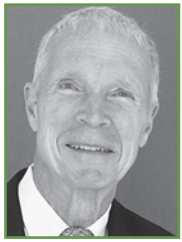
f First Term · *s* Second Term · *m* Long-term Member
v Visitor · *vp* Visiting Professor

Members and Visitors

Johannes Henn

Particle Physics · Institute for Advanced Study
Verizon Member; additional funding provided by the United States Department of Energy

Johannes Henn's research focuses on supersymmetric quantum field theory and its relation to string theory. He is working on recently discovered dualities between scattering amplitudes, correlation functions of local operators, and Wilson loops with the aim of finding new hidden structures in the weak and strong coupling description of these objects.



John J. Hopfield

Biology · Princeton University · *vp*
Martin A. and Helen Chooljian Visiting Professor in Biology

Physical systems with a large number of simple interacting parts typically exhibit robust collective dynamics. Brains are large systems whose cellular properties and interactions have evolved to yield activity dynamics that solve computational problems relevant to survival. John Hopfield's current research examines issues such as "thinking" and "perception" in the intersection between these two ideas.

Boaz Katz

Astrophysics · Institute for Advanced Study · *m*
John N. Bahcall Fellow; additional funding provided by the NASA Einstein Fellowship Program

While at the Institute, Boaz Katz plans to work on various problems within the field of high-energy astrophysics. In particular, he intends to continue his study of the early emission from supernovae and the origin of cosmic rays.

Woong-Tae Kim

Astrophysics · Seoul National University · *f*

Woong-Tae Kim works on astrophysical gas dynamics and magnetohydrodynamics using numerical simulations. His current interests include galactic star formation, gas dynamics in barred-spiral galaxies, gaseous dynamical friction, and cooling flows in galaxy clusters.

Igor R. Klebanov

Field Theory and Strings · Princeton University
IBM Einstein Fellow

Igor Klebanov has made progress on the foundational aspects of the gauge/gravity duality and on its applications to embedding cosmic inflation into string theory. He also works on various general issues in quantum field theory, such as the color confinement or measures of the number of degrees of freedom.

f First Term · *s* Second Term · *m* Long-term Member
v Visitor · *vp* Visiting Professor

Members and Visitors

Zohar Komargodski
String Theory, Supersymmetry, Phenomenology · Institute for Advanced Study · *m*
Corning Glass Works Foundation Member; additional funding provided by the National Science Foundation

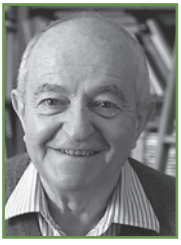
Zohar Komargodski's research concerns quantum field theories. He is interested in their connection to string theory and to particle physics phenomenology. In particular, he intends to work on supersymmetry and its breaking.

Brian Cameron Lacki
Astrophysics · Institute for Advanced Study
National Radio Observatory Jansky Fellowship

Radio waves and gamma-rays from galaxies come from cosmic rays, highly relativistic particles. Brian Lacki's research involves understanding this radiation: mapping the cosmic rays, especially in radio; galactic magnetic fields; and whether this radiation makes up the cosmic backgrounds of radio waves and gamma-rays.

Ning Lei
Biology · Institute for Advanced Study

Autism is a clinically and etiologically heterogeneous developmental disorder. Genetics plays a major role in the etiology of autism as evidenced from twin and family studies. Ning Lei is carrying out a family-based association study using the Autism Genetic Resource Exchange database to identify specific genes with a major effect on disease risk.



Albert Libchaber
Biology · The Rockefeller University · *vp*
Florence Gould Foundation Visiting Professor

Albert Libchaber studies mathematical patterns in biology at the molecular, cellular, and organismal levels. His work examines RNA molecular structure; the minimal conditions needed to produce an artificial cell; and the interactions and dynamics between organism and environment, including the effects of moving boundary conditions on fluid flow.

Marilena LoVerde
Cosmology, Astrophysics · Institute for Advanced Study
AMIAS Member; additional funding provided by the National Science Foundation

Marilena LoVerde is interested in all topics related to the origin and evolution of structure in the universe. At the Institute, she plans to develop techniques to study gravitational lensing and non-Gaussianity and to explore astrophysical probes of fundamental physics.

f First Term · *s* Second Term · *m* Long-term Member
v Visitor · *vp* Visiting Professor

Members and Visitors

Sergio Lukic
Genetics · Institute for Advanced Study
The Rita Allen Foundation Member in Biology

Sergio Lukic is broadly interested in the evolution of strongly interacting molecular-genetic networks. To this end, he is developing mathematical and statistical tools in population genetics to study the dynamics of demography, natural selection, epistasis, and recombination in patterns of genetic variation in natural populations.

Elke Katrin Markert
Biology · Institute for Advanced Study · *m*
Bristol-Myers Squibb Member in Biology

Elke Markert's research background is in algebraic topology, where she has been studying structures emerging from mathematical quantum field theory. She is working on the analysis of higher-level structures in biological systems using the mathematical framework of hyperstructures. She will also begin to study the influence of gene regulation in cancer and other diseases.

Gregory Moore
Mathematical Physics · Rutgers, The State University of New Jersey · *s*
Funding provided by the Ambrose Monell Foundation

Gregory Moore's work focuses on mathematical physics, with an emphasis on string theory, M-theory, and gauge theories more generally. His work places particular emphasis on the underlying mathematical structures and applications to and from modern mathematics.

Arvind Murugan
Biology · Institute for Advanced Study
Addie and Harold Broitman Member in Biology

Arvind Murugan plans to work on problems in biophysics, from problems involving the thermal nature of biochemistry to evolution and population dynamics.

Jean-Claude Nicolas
Biology · Université Pierre et Marie Curie
Susan and Jim Blair Member in Biology

Jean-Claude Nicolas is interested in LINE elements, which are selfish genes that move in the human genome to new locations over the lifetime of the host. Mapping these movements and locations and determining the consequences has become possible in the last year. Computational approaches to this task are being developed.

f First Term · *s* Second Term · *m* Long-term Member
v Visitor · *vp* Visiting Professor

Members and Visitors

Vasily Pestun
Theoretical Physics · Institute for Advanced Study
Funding provided by the National Science Foundation

Vasily Pestun is interested in nonperturbative dynamics of strongly interacting nonabelian gauge theories, in particular in exact results in supersymmetric gauge theories related to integrability, gauge-string correspondence, and topological field theories.

David Poland
Physics Beyond the Standard Model, Conformal Field Theories · Institute for Advanced Study
Funding provided by the United States Department of Energy

David Poland is interested in physics beyond the Standard Model and its connection to electroweak symmetry breaking and dark matter. He is also interested in developing new methods to learn about strongly coupled field theories and in particular the role that near-conformal dynamics might play in new physics.

Rafael A. Porto
Theoretical Physics · Institute for Advanced Study
Funding provided by the United States Department of Energy; additional funding provided by the National Science Foundation

Broadly speaking, Rafael Porto is a theoretical physicist working on the fundamental and observational aspects of gravity and quantum field theory. His interests include black holes, gravitational waves, cosmology, high-energy physics, and all the connections between them.

Shlomo S. Razamat
Theoretical Physics · Institute for Advanced Study
Funding provided by the National Science Foundation

Shlomo Razamat's research interests concern different aspects of quantum field theory and string theory and the interplay between them. He is mainly working on gauge/string (gravity) duality and on studying properties of strongly coupled supersymmetric field theories.

Hanno Rein
Theoretical Astrophysics · Institute for Advanced Study
Funding provided by the National Science Foundation

Hanno Rein is studying the formation and evolution of planetary systems. During his stay at the Institute, he intends to work on analytic models and large-scale numerical simulations to explain the dynamical configuration of exoplanets and our own solar system.

f First Term · *s* Second Term · *m* Long-term Member
v Visitor · *vp* Visiting Professor

Members and Visitors

Adam Rej
AdS/CFT Correspondence and Integrable Models · Institute for Advanced Study
European Commission Madame Curie Fellowship

Adam Rej's research focuses on diverse aspects of integrable systems, nonperturbative methods in gauge and string theory, and strong/weak coupling dualities. He is particularly interested in the integrable and solvable structures emerging in the planar AdS/CFT correspondence.

Amit Sever
String Theory, Quantum Field Theory · Perimeter Institute for Theoretical Physics
Funding provided by the United States Department of Energy

Amit Sever is working to solve the simplest example of an interacting quantum field theory in four dimensions: N=4 SYM, which is an interacting conformal gauge theory with maximal supersymmetry. He is focusing on computing scattering amplitudes using integrability, and have started computing correlation functions, the next step in complexity.

Joan Simon
Theoretical Physics · The University of Edinburgh · *v, s*

Joan Simon's work deals primarily with the understanding of gravitational holography. In particular, he is interested in its relation to thermodynamics beyond black holes physics, the emergence of classical geometry, and the extension of holographic ideas in time-dependent situations such as in cosmology or thermalization processes.

Tracy Slatyer
Particle Physics, Astrophysics · Institute for Advanced Study
Funding provided by the National Science Foundation

At the Institute, Tracy Slatyer will continue her work on novel models of dark matter and their astrophysical and cosmological consequences. She is also interested in model-building and experimental probes for physics beyond the Standard Model more generally, and in exploring new research directions in high-energy theoretical physics.

Aristotle Socrates
Astrophysics · Institute for Advanced Study · *m*
John N. Bahcall Fellow; additional funding provided by the Ambrose Monell Foundation

Aristotle Socrates is interested in high-energy astrophysics, particularly the physical processes that underlie accretion onto black holes and neutron stars. He is exploring the effects of cosmic ray production on the mass and luminosity of galaxies and their respective black holes, and studying the tidal and thermal evolution of extrasolar giant planets.

f First Term · *s* Second Term · *m* Long-term Member
v Visitor · *vp* Visiting Professor

Members and Visitors

David S. Spiegel
Exoplanetary Science · Institute for Advanced Study
Funding provided by the National Science Foundation

Dave Spiegel, whose interests range from X-ray studies of the intergalactic medium to understanding the origin of highly magnetic white dwarf stars, is focusing on theoretical studies of the climates of, and radiative transfer in, exoplanetary atmospheres; on habitability models of terrestrial exoplanets; and on radiation-dynamical models of gas giant planets.

Matthew Sudano
Particle Physics · Institute for the Physics and Mathematics of the Universe, Kashiwa, Japan · *v, f*

Matthew Sudano's work has primarily been devoted to understanding supersymmetry and how it might interface with the real world. He plans to continue studying relatively tractable systems, including supersymmetric and conformal field theories, while deriving inspiration from observation.

Rashid Sunyaev
Astrophysics · Max-Planck-Institut für Astrophysik · *vp*
Maureen and John Hendricks Visiting Professor

Rashid Sunyaev has made major contributions in the fields of physical cosmology and high-energy astrophysics. His current research interests include the cosmological recombination of hydrogen and helium, the physics of gas accretion onto neutron stars and black holes, the problem of matter, and radiation interaction under extreme astrophysical conditions.

Tiberiu Tesileanu
Biology · Institute for Advanced Study
Charles L. Brown Member in Biology

Tiberiu Tesileanu is currently working on developing thermodynamic models of transcriptional regulation in bacteria and in mammalian cells. While at the Institute, he plans to work on understanding how computation with unreliable components is achieved in biological systems, and to draw parallels with artificial computation.

Tsvi Tlusty
Biology · Weizmann Institute of Science
Martin A. and Helen Chooljian Founders' Circle Member

Tsvi Tlusty is interested in what distinguishes living matter from the lifeless and looking at living systems as evolvable molecular information processors that may reveal their fundamental principles. In particular, he is focused on how the function of proteins as information channels that operate under distinct biochemical constraints may explain the unique physical properties of this state of matter.

f First Term · *s* Second Term · *m* Long-term Member
v Visitor · *vp* Visiting Professor

Members and Visitors

Alexei Vazquez
Biology · The Cancer Institute of New Jersey · *v*

At the Institute, Alexei Vazquez will continue to work on developing statistical frameworks to analyze large biological datasets and to understand the organization of biological systems. He will also study the metabolism of cancer cells.

Dan Xie
Particle Physics · Institute for Advanced Study
Zurich Financial Services Member; additional funding provided by the United States Department of Energy

Dan Xie's research focuses on string theory and quantum field theory and the mathematical structure behind these physical theories. At the Institute, he will continue studying dynamics of quantum field theory in various dimensions and their phenomenological applications.

Amit Pratap Singh Yadav
Cosmology, Astrophysics · Institute for Advanced Study
Funding provided by NASA

Amit Yadav's research focuses on the Cosmic Microwave Background (CMB) temperature and polarization, and the early universe. Specific topics of his research include connecting primordial non-Gaussian signatures in CMB to specific classes of inflationary models, weak gravitational lensing, and extracting primordial B-modes.

f First Term · *s* Second Term · *m* Long-term Member
v Visitor · *vp* Visiting Professor

School of Social Science

Administrative Officer: Donne Petito

Founded in 1973, the School of Social Science takes as its mission the analysis of societies and social change. It is devoted to a multidisciplinary, comparative, and international approach to social research.

Professors of the School have participated actively in the most important contemporary debates about the meaning of the "interpretive turn" in anthropology, history, and political theory; about the centrality of culture, language, ritual, and moral understandings in the study of society; about the character and direction of social change; about the explanatory power of rational choice in the analysis of political decision-making and economic exchange; and about the epistemological and theoretical issues related to critical thinking. Although each is rooted in his or her own discipline, all do work that transcends disciplinary boundaries. The School operates under the guiding principles of informality and collegiality and with a shared understanding that the social sciences are not to be narrowly defined. Each year, the School brings together scholars from various fields—including political science, economics, law, psychology, sociology, anthropology, history, philosophy, and literary criticism—to examine historical and contemporary problems.

In an attempt to create a sense of community among the Members, the School designates an annual theme, which is neither exclusive nor excluding. The theme for the 2011–12 academic year is "Morals and Moralities." Moral arguments and moral sentiments are constantly mobilized in policy decisions. Philosophers have always dealt with morality; historians, sociologists, anthropologists, and economists have analyzed moral norms and values; and emerging fields, such as moral psychology and neuroethics, propose innovative understandings. But how can we articulate these paradigms? How could the study of morality move beyond formal dilemmas to comprehend the ordinary functioning of social action? How could the interpretation of moralities resist reduction to relativism or universalism? How are moral economies negotiated and transformed? How are moral and political issues increasingly associated, particularly around human rights and humanitarian intervention? How can social scientists continue to develop their critical approach when accounting for situations and facts so morally loaded? Under the direction of Didier Fassin, James D. Wolfensohn Professor, these are some issues the seminar will examine.

Faculty

Danielle S. Allen
UPS Foundation Professor

Danielle Allen is a political theorist who has published broadly in democratic theory, political sociology, and the history of political thought. As a democratic theorist and historian of political thought, she investigates core values such as equality, non-domination or freedom, and trustworthiness. As a political sociologist, she analyzes relations among legal structures, political values, and power dynamics, as well as foundational practices such as punishment, deliberation, opinion formation, and citizenship generally. She is currently working on books on citizenship in the digital age and education and equality.

Didier Fassin
James D. Wolfensohn Professor

Didier Fassin, an anthropologist and a sociologist, trained as a physician in internal medicine and public health. He dedicated his early research to medical anthropology, illuminating important issues about the AIDS epidemic, social inequalities in health, and the changing landscape of global health. More recently, he has developed a new domain of inquiry he terms "political and moral anthropology," analyzing the reformulation of injustice and violence as suffering and trauma, the expansion of an international humanitarian government, and the contradictions in the contemporary politics of life. His present project explores the political and moral treatment of disadvantaged groups, including immigrants and refugees, through an ethnography of police, justice, and prison.

Eric S. Maskin *(through December 31, 2011)*
Albert O. Hirschman Professor

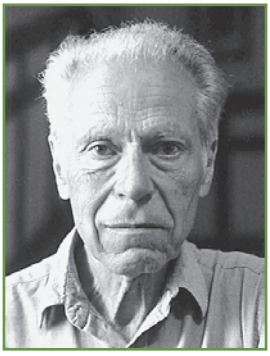
Eric Maskin is probably best known for his work on the theory of mechanism design, for which he shared the 2007 Nobel Memorial Prize in Economics. He has made contributions to many other areas of economics as well, including game theory, social choice theory, and political economy.

Faculty

Joan Wallach Scott

Harold F. Linder Professor

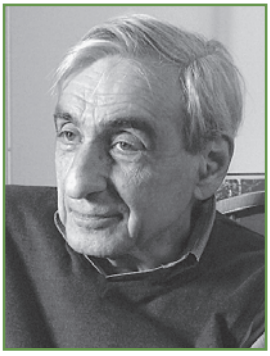
Joan Scott's groundbreaking work has challenged the foundations of conventional historical practice, including the nature of historical evidence and historical experience and the role of narrative in the writing of history. Her recent books have focused on the vexed relationship of the particularity of gender to the universalizing force of democratic politics. More broadly, the object of her work is the question of difference in history: its uses, enunciations, implementations, justifications, and transformations in the construction of social and political life.



Albert O. Hirschman

Professor Emeritus

During his retirement years, Albert Hirschman continued to work and write on problems of economic development in Latin America as well as on more general social-science subjects. Lately, health problems have forced him to retire from active academic work.



Michael Walzer

Professor Emeritus

One of America's foremost political thinkers, Michael Walzer has written about a wide variety of topics in political theory and moral philosophy, including political obligation, just and unjust war, nationalism and ethnicity, economic justice, and the welfare state. In addition to writing frequently about war and terrorism, he is currently addressing questions of pluralism, ethnicity, cultural rights, and multiculturalism. He continues to work on volumes three and four of a major collaborative project focused on the history of Jewish political thought.

Members and Visitors

Celeste Arrington
Political Science · The George Washington University
Ginny and Robert Loughlin Founders' Circle Member

Celeste Arrington is studying mechanisms of inclusion and exclusion in democratic politics in South Korea and Japan. Her book project analyzes state responsiveness to victim redress movements. She is also examining how conflicts over what constitutes morally just-and-fair redress are mediated by legal institutions, moral codes, framing, and power dynamics.

Gail Bederman
History · University of Notre Dame

Gail Bederman's project is focused on a set of interwoven narratives about the lives and writings of William Godwin, Mary Wollstonecraft, and T. R. Malthus between 1792 and 1803, which provide a sort of genealogy of the naturalized logics and political premises underlying contemporary U.S. disputes over the morality of abortion.

Elizabeth Bernstein
Sociology · Barnard College

Elizabeth Bernstein is researching the construction of "sex trafficking" as a moral and political issue within the contemporary United States and transnationally. She is considering the moral politics of conservative Christians, secular feminists, and bipartisan state officials who have successfully framed their concerns around sexual slavery and forced migration into broad-ranging discourses and policies.

Andreas Blume
Economics · University of Pittsburgh
Roger W. Ferguson Jr. and Annette L. Nazareth Member

Andreas Blume studies strategic communication. He currently is focused on reconciling the intuition of frequent disagreement about meaning with the fact that in the equilibria of communication games the uses of messages are known. The aim is to understand how language compatibility shapes organizations and institutions such as contracting and expert advice.

Jonathan Caverley
Political Science · Northwestern University · *v*

Jonathan Caverley is completing a book, "Death and Taxes: The Political Economy of Democratic Militarism," which examines the distribution of the costs of defense within democracies, and its contribution to military aggressiveness. He also studies the globalization of the defense industry and the role of technology in international politics.

v Visitor

Members and Visitors

Wendy Hui Kyong Chun
New Media Studies · Brown University

Wendy Chun's work on new media addresses the interrelations between media, culture, and technology. Her newest book project, "Imagined Networks," focuses on the importance of the imagination and images to the experience and conception of networks.

Thomas J. Csordas
Anthropology · University of California, San Diego

Thomas Csordas works on issues of embodiment and the transformation of meaning in illness and healing. He is examining (with Janis H. Jenkins) the moral valence of adolescent mental health care, particularly the experiential immediacy of young people's lives and the institutional structure of care available to them and their families.

Jeremiah Dittmar
Economics · American University
Deutsche Bank Member

The printing press was the great innovation in early modern information technology and arguably provides the closest historical parallel to the Internet. Jeremiah Dittmar's research documents how the information technology revolution of the Renaissance transformed the economic geography of Europe and contributed to the emergence of modern economic growth.

James Doyle
Philosophy · University of Bristol · *v*

James Doyle is working on a book on Plato's *Gorgias*. This will give an analysis of the main arguments of the dialogue, and an account of the use to which Plato puts the dialogue form, as leveling an implicit critique of Socrates' conception of philosophical method and his associated doctrine of "intellectualism."

Sherine F. Hamdy
Anthropology · Brown University
The Wolfensohn Family Member

Sherine Hamdy's current project treats sensational media reports about strange medical cases and new forms of bodily intervention in contemporary Egypt as moments that can shed light on dramatic transformations in Egypt's sociopolitical landscape. She is particularly interested in shifting gender norms and everyday ethical dilemmas that emerge in overlooked and marginalized segments of Egyptian society.

v Visitor

Members and Visitors

Alexander L. Hinton
Anthropology · Rutgers, The State University of New Jersey

Alex Hinton's research focuses on genocide and mass violence. His early work explored the origins of genocide and perpetrator motivation. His more recent research examines the aftermaths of genocide, with an emphasis on trauma, memory, and transitional justice. His current book project focuses on the Khmer Rouge Tribunal in Cambodia.

Beth Kiyoko Jamieson
Political Science · Institute for Advanced Study · *v*

Kiki Jamieson studies the ways gender is defined and enforced through legal and political institutions. She explores issues of discrimination and punishment related to gender identity and expression, with particular emphasis on the force of law felt by gender nonconforming people in institutions ranging from prisons to schools to marriage.

Janis H. Jenkins
Anthropology · University of California, San Diego

Janis Jenkins studies subjectivity, cultural meaning, and sociopolitical dimensions of mental health and illness. She is examining (with Thomas J. Csordas) the moral subjectivities of youths and families living under conditions of structural violence and personal crisis, particularly the lived experience of institutional arrangements for care, containment, and management of adolescent mental health.

Andrew Johnston
Architecture, Cultural Geography · Xi'an Jiaotong-Liverpool University, Suzhou, China · *v*

Andrew Johnston is working on a book, "Quicksilver Landscapes: Space, Power, and Ethnicity in the Mercury Mining Industry in California and the West, 1845–1890." This book reconstructs the cultural landscapes of the mercury industry in the context of race, technology, the organization of labor, and everyday life.

Amy Kaplan
American Studies · University of Pennsylvania

Amy Kaplan is writing a book, "American Zionism," historicizing the presumption that the United States and Israel have a timeless bond rooted in common traditions and values. She focuses on U.S. culture as the medium in which this relationship grew. Beyond the political alliance, Kaplan explores how cultural identification with Israel upheld cherished American myths.

v Visitor

Members and Visitors

Eugene Kontorovich

Constitutional and International Law · Northwestern University School of Law
Deutsche Bank Member

Eugene Kontorovich will examine the lessons of piracy for international criminal law. Piracy is the oldest international crime, a revived security challenge, and the conceptual model for the modern international criminal regime. Thus it offers a yardstick for measuring the progress of international law from the eighteenth century to today.

Jennifer S. Light

History · Northwestern University

Jennifer Light is writing about the historical and contemporary significance of the junior republic movement, 1895–1945, when children joined self-governing communities for civic and character education. A book will expand the historiography of educational simulations. A companion article will address technology designers seeking to educate today's youth using digital simulation tools.

Jennifer London

Political Science · Institute for Advanced Study · *v*

Jennifer London is a political theorist working on Arabic models of the just world. She will complete a manuscript on the political thought of the Persian secretary Ibn al-Muqaffa'—a luminary of early Arabic prose. She will analyze how Ibn al-Muqaffa' introduced Persian political ideas at the 'Abbasid court to achieve greater authority.

Steven Lukes

Sociology · New York University

Steven Lukes is writing a book that aims to reconstruct the history of sociological and anthropological thinking about morality, surveys the ways in which morals have been understood historically and cross-culturally, and seeks to bring a sociological perspective to the current discussions of morality among evolutionary biologists, neuroscientists, and geneticists.

William Bentley MacLeod

Economics · Columbia University
Leon Levy Foundation Member

W. Bentley MacLeod studies the design of contracts for the supply of complex goods and services, particularly labor and education. He plans to complete the book "The Economics of Incentive Contracts" for MIT Press. In addition, he will continue work on the economics of education with Miguel Urquiola at Columbia University.

v Visitor

Members and Visitors

Karuna Mantena
Political Science · Yale University

Karuna Mantena's project reconsiders Gandhi's political thought from the standpoint of a realist theory of political means. Though Gandhi is often taken to be the exemplary figure of a form of conviction politics, Mantena will explore how Gandhi's politics were connected to a contextual and consequentialist theory of political violence.

Andrew Moravcsik
Political Science, International Relations, European Studies · Princeton University · *v*

In two parallel projects on the European Union and on global multilateral institutions, Andrew Moravcsik is looking at how international law and organization—which are said to distance individuals from the public decisions that shape their lives—can sustain, and often even enhance, the legitimate functioning of national democracies.

Angel Adams Parham
Sociology · Loyola University New Orleans

In her work, Angel Parham argues that theories of race in the United States need to better account for the ways local experiences are often shaped by past or present ties to transnational regions. Her project examines the impact of Louisiana's historical ties to St. Domingue/Haiti on current understandings of race in Louisiana.

In-Uck Park
Economics · University of Bristol
Richard B. Fisher Member

In-Uck Park's research uses game-theoretic approaches and aims to further our understanding of how agents communicate information and coordinate actions in various situations involving conflict of interests. Currently, he is studying the interrelationship between vertical inequality within organizations and the structure of organizations to be formed endogenously.

Nancy Scheper-Hughes
Anthropology · University of California, Berkeley
Friends of the Institute for Advanced Study Member

Nancy Scheper-Hughes is writing a book, "The Ghosts of Montes de Oca," which is based on archival and ethnographic research between 2000–11 and analyzes the cultural-ideological, political, and psychiatric forces that created a death-camp-like environment within Argentina's national asylum for the profoundly mentally deficient during the Dirty War, and why it continued through 2007.

v Visitor

Members and Visitors

Jessica E. Sewell
Architectural History · Boston University

Jessica Sewell's work focuses on the intersection between gender and architecture, cities, and material culture. Her book, "Manly Things: Masculine Interiors and Domestic Objects in the Postwar United States," will explore the relationship between masculine interiors and domestic objects, masculinity, and the shift to consumption-based identity in the postwar United States.

Judith Surkis
History · Institute for Advanced Study · *v*

Judith Surkis is writing a book about how ideas of religious and sexual difference underwrote the plural and hierarchical juridical system that operated in colonial Algeria. Her project offers a new vantage from which to understand the entangled history of French and "Muslim" law.

Kabir Tambar
Anthropology · Stanford University

Kabir Tambar is completing a book that examines the institutional pressures and risks that shape the moral experience of modernity in contemporary Turkey, focusing specifically on the Alevi community. The book illuminates the stakes of challenging, as well as of yielding to, the seductions of modernity in the contemporary Muslim world.

Kimberly Theidon
Anthropology · Harvard University

Kimberly Theidon is exploring how the former combatants with whom she works in Colombia conceptualize not only killing, but also justice, reparations, and reconciliation. In the context of sustained lethal violence, what are the resources individuals and collectives marshal to bring violence to a halt? Once the killing stops, how do people live together again?

Peter Vanderschraaf
Philosophy · University of California, Merced

Peter Vanderschraaf is exploring the relationship between morality and convention. His work is intended to form part of an ancient but relatively underdeveloped tradition in philosophy that analyzes justice and other large parts of morality as subsets of the systems of conventions that regulate human societies.

v Visitor

Members and Visitors

Justus von Daniels
Law and Religion, Sociology of Law · Benjamin N. Cardozo School of Law, Yeshiva University · *v*

Justus von Daniels is analyzing the processes and mechanisms of practiced legal interaction of religious law and state law in the United States. His study aims to explain some dynamics of legal pluralism: in the case of religious law, different forms of hybrid norms, weak legal autonomy, and procedural cooperation evolve from a context-sensitive coordination.

Jarrett Zigon
Anthropology · University of Amsterdam
AMIAS Member

Utilizing an anthropological theory of moralities that he has developed over the last ten years, Jarrett Zigon will do a genealogical-discursive analysis on the sociopolitical context of the rise of human rights as a moral discourse, and consider the results of ongoing transnational ethnographic research in four HIV/AIDS prevention and treatment programs.

v Visitor

Program in Interdisciplinary Studies

The Program in Interdisciplinary Studies explores different ways of viewing the world, spanning a range of disciplines from physics—especially computational astrophysics, geology, and paleontology—to artificial intelligence, cognitive psychology, and philosophy. The program is headed by Professor Piet Hut.

Faculty

Piet Hut
Professor

The focus of Piet Hut's research is computational astrophysics, in particular multiscale multiphysics simulations of dense stellar systems. In addition, he is actively involved in interdisciplinary explorations in the areas of cognitive science and philosophy of science centered around questions involving the nature of knowledge. In both areas, he has recently started to explore the use of virtual worlds to enable remote online collaborative research through simultaneous "lab meetings" with colleagues from Europe, Japan, the United States, and elsewhere.

Visitors

Jeff Ames
Computer Science · Rutgers, The State University of New Jersey · *v*

Jeff Ames is interested in the potential of virtual worlds in education, to facilitate experiential learning and add an element of play, and in scientific research, especially for collaborative data visualization and simulation.

Monica Manolescu
American Literature and Art · Université de Strasbourg · *v*

Monica Manolescu has done research on Vladimir Nabokov and on contemporary American literature. She is now working on a book about the geographical imagination of recent American writers and artists who are using maps and mapmaking in their work.

v Visitor · *s* Second Term

Visitors

Philip Ording

Mathematics · Medgar Evers College, The City University of New York · *v, s*

Philip Ording is a New York-based mathematician writing a manuscript comprising a variety of proofs of a single theorem. Inspired by Raymond Queneau's *Exercises in Style*, the work explores the notion of mathematical style.

Edwin Turner

Astrophysics · Princeton University · *v*

Edwin Turner will be working on statistical biases and estimators for samples of exoplanets detected using various techniques; on the SEEDS project (Subaru exoplanet studies); and on implications of complexity in cellular automata systems for the limits of reductionism, as well as related topics in the philosophy of science.

v Visitor · *s* Second Term

Director's Visitors

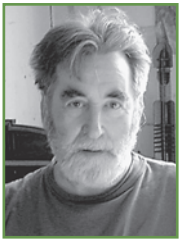
Director's Visitors contribute much to the vitality of the Institute. Scholars from a variety of fields, including areas not represented in the Schools, are invited to the Institute for varying periods of time, depending on the nature of their work.

Subhankar Banerjee
Photographer, writer

Subhankar Banerjee is an Indian-born American photographer, writer, and activist, and the founder of ClimateStoryTellers.org. His ongoing work, land-as-home, focuses on ecocultural rights issues in the arctic and desert ecoregions of North America and Siberia. At the Institute, he will begin his study of forest ecoregion of the Global South.

Louise Dolan
Professor, The University of North Carolina at Chapel Hill

Louise Dolan's work is on string theory and non-Lagrangian formulations of gauge theories; and she continues her computations of infinite-dimensional symmetries in relativistic field theories and their applications to exact solvability.



Tom Phillips
Painter, writer, composer

Tom Phillips comes with a few tasks for default reassurance but always ends up thinking along new lines or even embarking on new projects in the here and now. Stimulation comes from the woods and from the words of people who shine small torches on the infinite.

Artist-in-Residence Program

The Artist-in-Residence Program was established in 1994 to create a musical presence within the Institute community, and to have in residence a person whose work could be experienced and appreciated by scholars from all disciplines. Derek Bermel continues as Artist-in-Residence, organizing "The Harmonic Series," the 2011–12 Edward T. Cone Concert Series, while pursuing his scholarly and creative interests and developing major work.

Derek Bermel

Composer, clarinetist, conductor, and jazz and rock musician

Derek Bermel, who was nominated for a Grammy Award in 2010, directs the Edward T. Cone Concert Series at the Institute. He has composed a new work combining the ensembles Music from China and Music from Copland House, to be premiered at the Freer Gallery in Washington, D.C., in October 2011. He will be performing Aaron Copland's Clarinet Concerto at Carnegie Hall with the American Composers Orchestra in February 2012, and he has received a comission from SummerStage in New York City for a large-scale work for the ensemble Alarm Will Sound.

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Index

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SHS School of Historical Studies · *SM* School of Mathematics · *SNS* School of Natural Sciences · *SSS* School of Social Science

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