IAS

Institute for Advanced Study

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$$\{\nabla_\alpha, \nabla_\beta\} = \gamma^c_{\alpha\beta} \nabla_c$$

$$c = 0 \ldots 9 \;,\; \alpha = 1 \ldots 16$$

$$\nabla_\alpha = D_\alpha + A_\alpha(x, \theta)$$

$$D_\alpha = \frac{\partial}{\partial \theta^\alpha} + (\gamma^c \theta) \frac{\partial}{\partial x^c}$$

$$\nabla_a = \frac{\partial}{\partial x^a} + A_a(x, \theta)$$

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Faculty and Members
2007–2008

Contents

Information contained herein is current as of September 10, 2007.

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 scholarship—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 philanthropists 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 twenty-seven 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 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. Small in number and organized in four Schools (Historical Studies, Mathematics, Natural Sciences, and Social Science), the Faculty and Members can interact with one another without any departmental or disciplinary barriers.

Each year the Institute awards fellowships to some 190 visiting Members from about one hundred universities and research institutions throughout the world. The Institute's more than 5,000 former Members hold positions of intellectual and scientific leadership in the United States and abroad. Some twenty-one Nobel laureates, and thirty-four out of forty-eight Fields Medalists have been Institute Faculty or Members. Many winners of the Wolf and MacArthur prizes have also 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 1,200 journals. The Mathematics-Natural Sciences Library contains over 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 800 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 research throughout the humanistic disciplines, from socioeconomic developments, political theory, and modern international relations, to the history of art, science, 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. Support has also been extended to the history of other regions, including central Asia, India, and Africa.

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
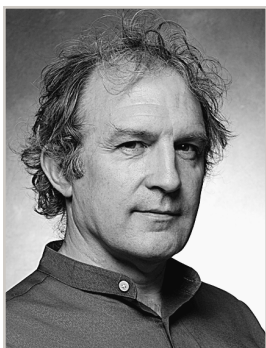
Yve-Alain Bois
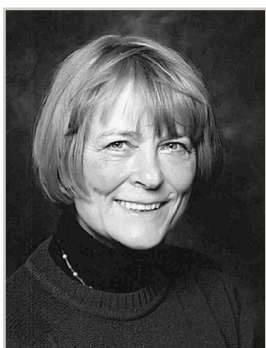*Professor* . Art History

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. Curator of a number of influential exhibitions in the past decade, 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.

Caroline Walker Bynum
Professor . Western Medieval History

Caroline Bynum's work has been instrumental in introducing the concept of gender into the study of medieval Christianity. Her path-breaking books created the paradigm for the study of women's piety that dominates the field today and helped propel the history of the body into a major area of premodern European studies. She is currently working on pilgrimage and piety in Germany, and on theories of identity in medieval theology.

Patricia Crone
Andrew W. Mellon Professor . Islamic History

Patricia Crone's scholarly and intellectual activities concentrate on the history of late antiquity and the early Middle Ages, ca. 630 to 1100, when a recognized Islamic culture appeared and subsequently rose to dominate the area from Spain to the frontiers of China and India. Author of numerous books and published papers, Crone's work challenges long-held explanations and provides new approaches for the social, economic, legal, and religious patterns that transformed late antiquity.

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, the historiography of Inner Asian peoples in ancient China, the political and economic history of the early Manchu state, and relations between European merchants and the Mongol empire in the Middle Ages.

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 the modern ideas of democracy, equality, toleration, freedom of the press, and individual freedom.
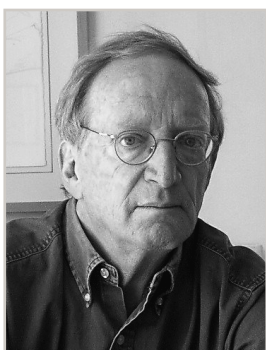
Avishai Margalit

George F. Kennan Professor · Philosophy and Modern International Relations

Avishai Margalit is one of the foremost thinkers and commentators on the contemporary human condition, the moral issues of our time, and current problems facing Western societies. In addition to his influence as a philosopher, he is highly regarded for his profound and cogent observations of the Israeli-Palestinian conflict and the broader struggle between Islam and the West. Author of a number of influential books, Margalit has transformed philosophical perspectives on a range of political and societal issues.

Faculty

Heinrich von Staden
*Professor* · 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 BC to the fifth-century AD. 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 projects include a book on Erasistratus (one of the two Hellenistic pioneers of human dissection), a study of the exegesis of scientific texts in antiquity, and further work on the "semantics of matter" in ancient science.
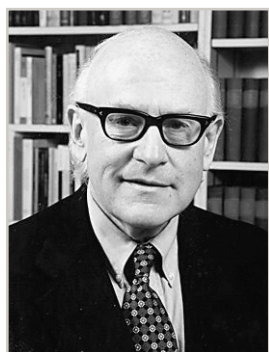
Glen W. Bowersock
Professor Emeritus · Ancient History

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.
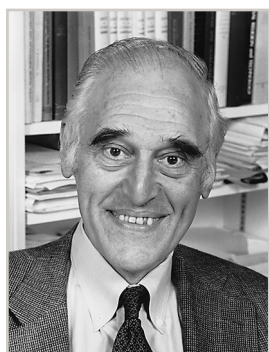
Giles Constable
Professor Emeritus · Medieval History

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, and Renaissance Florence as seen through the case of Antonio Rinaldeschi. He has written over a hundred articles, most of which have been reprinted in five volumes, and is currently working on a book on twelfth-century crusading.

Faculty
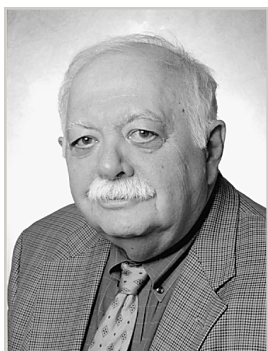
Oleg Grabar
*Professor Emeritus* · Islamic Art and Culture

Oleg Grabar's research has had a profound and far-reaching influence on the study of Islamic art and architecture. In his many authoritative books, he has introduced readers to the formation of Islamic art, the idea of ornament in the context of Islamic art, the physical and ideological influence of early Islam on Jerusalem, and a breadth of other subjects elucidating the history and range of Islamic art, architecture, decorative arts, and manuscriptss. His extensive archaeological expeditions and research trips cover the vast expanse of the Islamic world in Africa, the Middle East, and Muslim Asia.
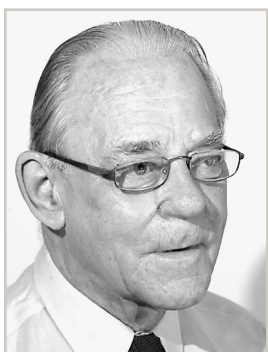
Christian Habicht
Professor Emeritus · Ancient History

Christian Habicht is among the leading historians of the Hellenistic period, and an authority on Greek Epigraphy and on the history of Athens in the centuries between the fall of the Athenian Empire and the establishment of the Roman Empire. He is also the author of books on the cults of the Hellenistic kings, on the Maccabees, and on Pausanias, among others.
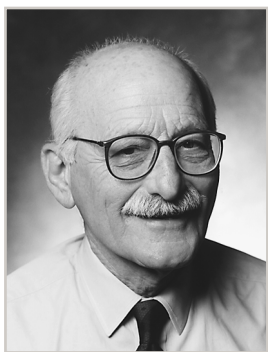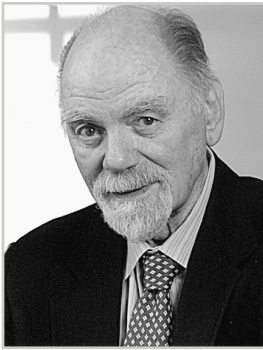

Irving Lavin
Professor Emeritus · Art History

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.

Faculty

Peter Paret

Professor Emeritus · Modern European History

Much of Peter Paret's research addresses two often related areas in history: conceptions of war and its uses, and the interaction of the arts with ideology and society. This year he published the third expanded edition of his biography of Clausewitz, as well as the German translation of his monograph on the artist Ernst Barlach under Nationalsocialism. He will deliver the 2008 Lees Knowles Lectures on the History of War at Cambridge University, and is preparing an exhibition in this country and in Germany of Barlach's interpretations of an iconic work in German culture and politics, the medieval Nibelungen epic.
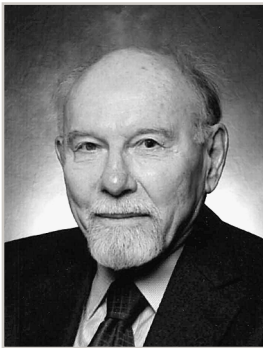
Morton White

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, religion, and their relations with science.

Members, Visitors, and Research Staff

Kazim Abdullaev

Art and Archaeology of Central Asia · Institute of Archaeology, Samarkand · *v, s*

Kazim Abdullaev's research project deals with gems, seals, and sealings from Bactria and Sogdia, dated from the Bronze Age to the early medieval period. He draws on many rare books, as well as published collections of gems and seals from museums in Uzbekistan, Tajikistan, and Russia.

Richard Abels

Medieval Military History · The United States Naval Academy · *f* · *v, s*
Funding provided by the Fund for Historical Studies

Richard Abels is using a wide range of evidence, including historical and literary narratives, charters, canon law, exegetical works, poetry, art, and archaeology to examine how cultural considerations and constraints shaped medieval warfare on all levels, from defining casus belli, to strategic and tactical decisionmaking, to the conduct and experiences of ordinary soldiers.

Aditya Behl

Islamic Studies, South Asia · University of Pennsylvania
*Funding provided by the Friends of the Institute for Advanced Study*

Aditya Behl is looking at the relationship between human and divine love in one of the major genres of premodern north Indian poetry, the Hindavi Sufi romance, composed by Muslim poets from the late fourteenth century onwards, which marks the inauguration of a new literary and devotional culture in a local language.

Persis Berlekamp

Islamic Studies, History of Art · University of Chicago
Funding provided by The Hetty Goldman Membership Fund

Persis Berlekamp is analyzing actual talismans within the medieval Islamic cosmological frameworks that were historically understood to govern their conditional efficacy. She intends to further the understanding of these talismans and contribute to the methodological challenge of interpreting premodern objects.
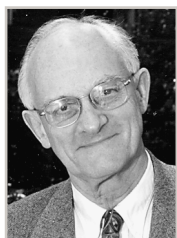
David Billington

Architecture and Engineering · Princeton University · *v, f*

David Billington is approaching modern engineering structure as a new art form parallel to but independent of architecture. As a second project, he will seek to show the central cultural role of modern engineering in American history.

Members, Visitors, and Research Staff

Joseph Blasi

Social and Economic History · Rutgers, The State University of New Jersey
William D. Loughlin Membership

Joseph Blasi is studying cases and specific periods in U.S. history where work and the corporation were conceived in ways that more broadly distributed power, prestige, and rewards. He will look at the use of employee ownership of company stock, profit sharing, broad-based stock options for all employees, and more cooperative employer-employee work cultures such as "shared capitalism."

Anne-Marie Bouché

Medieval History · Institute for Advanced Study · *a*

Anne-Marie Bouché is Professor Caroline Bynum's research assistant. She is completing a book on the mechanisms of visual communication that allowed medieval artists to convey complex intellectual messages to their audiences, and enabled those audiences to receive and understand them.

Susan Boynton

History of Music and Medieval Studies · Columbia University
Funding provided by the National Endowment for the Humanities

Susan Boynton's project centers on the study of medieval liturgical and musical manuscripts in Toledo Cathedral during the mid-eighteenth century by the Jesuit Andres Marcos Burriel (1719–62), including the reproductions created by his collaborator, the calligrapher Francisco Xavier Santiago y Palomares.

Philip Bullock

Russian Music, Literature, and Culture · University of Oxford · *f*
Edward T. Cone Membership in Music Studies

Philip Bullock will combine textual analysis and historical narrative to research and write the first English-language book-length study of art-song in Russia, a form exploited by all major Russian composers and loved by Russian audiences, but surprisingly little studied.

William Caferro

Medieval History · Vanderbilt University · *s*
Funding provided by The Gladys Krieble Delmas Foundation

William Caferro is examining the economic and cultural effects of war on Italian society from 1350 to 1450, and the counterintuitive hypothesis that war helped promote the cultural and artistic flourishing that we associate with the Renaissance movement.

f First Term · *s* Second Term
v visitor · *a* Research Assistant

Members, Visitors, and Research Staff
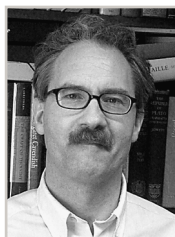
Stephen Clucas
Intellectual History · University of London · *v, f*

Stephen Clucas's research concerns Thomas Hobbes's *Elementorum philosophiae sectio prima de corpore* and its seventeenth-century context. He will produce a critical text of the 1655 edition as well as translations of passages from the 1655 Latin edition, which were omitted or substantially altered in the 1656 translation.

Luigi Capogrossi Colognesi
Roman Legal and Economic History · Università degli Studi di Roma "La Sapienza" · *v, s*

Luigi Capogrossi Colognesi is studying the managerial systems and the economic strategies that have characterized the history of Roman agrarian property, including the economic implications of Roman legal rules about real property; the rent and tenure of agrarian systems; and the relationship between slave and free labor employed in agriculture.

Harold Cook
History of Medicine · University College London · *f*
Funding provided by The Andrew W. Mellon Foundation

Harold Cook is studying "global history" approaches to the history of medicine, particularly Latin translations from Chinese medical texts made in the seventeenth century by Jesuit missionaries with interventions by Dutch and German editors.

Bryan Cuevas
East Asian and Tibetan Studies · Florida State University
Funding provided by The Starr Foundation Fund

Bryan Cuevas's project explores the politics of Tibetan war magic from the sixteenth to eighteenth centuries, leading up to and following the establishment of the office of Dalai Lama and the formation of a centralized Tibetan state. His research will look at the political uses of magic, the links between religion, violence, and war, and the role of religious ritual in the construction of sociopolitical identities.

Luc Duerloo
Early Modern International Relations · Universiteit Antwerpen · *s*
Funding provided by the Hans Kohn Membership Endowment

Luc Duerloo is working on a monograph that aims to deepen our understanding of the early seventeenth century, focusing on the international policies conducted by Archduke Albert (1598−1621) during his reign in the Netherlands, and revealing how traditional dynastic politics were increasingly at odds with military developments, religious tensions, and policies based on the reason of state.

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

Members, Visitors, and Research Staff

Sven Dupré

History of Science · Ghent University · *v, f*

Sven Dupré is working on a book-length study that will cover the long-term development of optics ca. 1450 to ca. 1700, and attempt to bridge the scholarly gap in research on the history of optics between the Middle Ages (when the discipline of optics was known as "perspectiva") and the Scientific Revolution of the seventeenth century (or the birth of modern geometrical optics).

Martin Eisner

Literary History · Duke University · *s*
Funding provided by the Fund for Historical Studies

Martin Eisner's project concerns the afterlife of Dante's *Vita Nuova*, focusing on its historical incarnations, from the earliest transcriptions to the most recent editions and adaptations. He will consider these materials as authentic testimonies to the potential meanings, and particular interpretive difficulties, of this complex and enigmatic work.

Andrea Falcon

Ancient Philosophy · Concordia University · *s*
Funding provided by The Herodotus Fund

Andrea Falcon works on Aristotle and the Aristotelian tradition in antiquity. He is currently looking at all the surviving evidence concerning Xenarchus of Seleucia, whose interests included physics, ethics, and psychology. He will also place Xenarchus's activity in the context of the return to Aristotle that took place in the first-century BC.

Arsenio Ferraces-Rodríguez

Classics · Universidad de La Coruña · *s*
Funding provided by The Andrew W. Mellon Foundation

Arsenio Ferraces-Rodríguez is working on a critical edition of a late antique herbal whose main source is a lost Latin translation of Dioscorides's *De materia medica*. The text with a full *apparatus criticus* will address various problems connected with the text, including its history, title, and the relationship between title and contents, secondary sources, date, and transmission.

Ofer Gal

History and Philosophy of Science · University of Sydney · *f*
Elizabeth and J. Richardson Dilworth Fellowship in Historical Studies

Ofer Gal's project explores the routes of the new science and the baroque, the two primary cultural movements of seventeenth-century Europe. He will also address the tension between overt commitment to harmony and practical acknowledgment of discordant reality, a tension that is perhaps the most distinctively baroque characteristic of early modern science.

f First Term · *s* Second Term
v visitor · *a* Research Assistant

Members, Visitors, and Research Staff
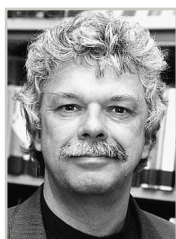
Detlef Garz

Exile Studies · Johannes Gutenberg University Mainz
Funding provided by the Fritz Thyssen Stiftung and The Andrew W. Mellon Foundation

Detlef Garz is conducting research into biographies (written in 1939) of "Jewish German" emigrants who had to leave their country during national socialism. He is interested in processes of recognition and even more so in processes of misrecognition, downward processes that began in imperial Germany and culminated in the 1930s.

Ursula Goldenbaum

Early Modern Intellectual History · Emory University
Funding provided by the Hans Kohn Membership Endowment

Ursula Goldenbaum will investigate Leibniz's turn to metaphysics, mechanical theory, and mathematics during his time in Mainz (1667–72). It is the claim of her book-length project that this was due to his concern about the dangerous theoretical consequences of mechanical philosophy for Christian dogmatic.

David F. Graf

Greek and Roman Near East · University of Miami · *s*
Funding provided by The Andrew W. Mellon Foundation

David Graf is preparing several hundred new Greek inscriptions recently discovered at Umm al-Jimāll and dated mainly from the first to the fourth-century AD. The corpus should make a significant contribution to future sociological and demographic analyses of the indigenous population of Arabia in the early Roman imperial era.

Brooke Holmes

Classics · Princeton University
Funding provided by The Andrew W. Mellon Foundation

Brooke Holmes is examining the concept of physical sympathy through three linked studies of Hellenistic poetry, life science, and philosophy. She will argue that sympathy can afford us a new aperture on postclassical Greek thinking about the natural world and its relationship to the human.

David Howell

Japanese History · Princeton University · *v*

David Howell is working on a book about disorder and the fear of violence in nineteenth-century Japan. He will explore how the peculiar contours of the landscape of power in early modern Japan shaped reactions to disorder, real and imagined, during the tumultuous decades leading up to the Meiji restoration of 1868.

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

Members, Visitors, and Research Staff

Masoud Jafarijaze

*Islamic History* · Institute for Advanced Study · *a*

Masoud Jafarijaze is a research assistant to Professor Patricia Crone. His research interests include Persian literature, especially the Samanid and Ghaznavid ages, and comparative studies in contemporary Persian literature.

Yosef Kaplan

Social and Cultural History · The Hebrew University of Jerusalem
Funding provided by The Andrew W. Mellon Foundation

Yosef Kaplan's research deals with the confessionalization of the Judeo-conversos who returned to Judaism in Western Europe in the early modern period, and with the means employed by the central Sephardic communities in northwestern Europe for the enforcement of confessional conformity and for the supervision of moral conduct and for the supervision of moral conduct among the members of these communities.
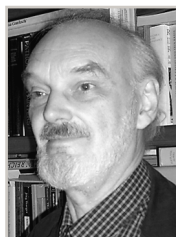
Peter Klein

Art History · Universität Tübingen
Funding provided by the Fritz Thyssen Stiftung

Peter Klein will apply a new theoretical concept, derived from ethnological and sociological models, to so-called "marginal images," which have emerged as a specific genre of medieval art. He will analyze the origin and early history of the images and will attempt to establish a general theory of marginal phenomena in medieval society and culture.

Barbara Kowalzig

Classics · Royal Holloway, University of London
Funding provided by The Herodotus Fund

Barbara Kowalzig's project investigates the interaction of religious behavior and economic practice in the archaic and classical Mediterranean. In addition to challenging traditional ideas about the social context from which ancient Greek religion emerged, her study will elucidate pioneering patterns of social, economic, and religious integration, productive and problematic, in Mediterranean societies to the present day.

Walter (Roy) Laird

History of Science · Carleton University, Ottawa
Funding provided by the Fund for Historical Studies

Walter (Roy) Laird is working on a comprehensive account of the rise of mechanics as a theoretical, mathematical, and practical science in the sixteenth century, leading to Galileo's new science of motion and a general tendency to see nature in mechanical terms, thus preparing the way for the mechanical philosophy of the seventeenth century.

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

Members, Visitors, and Research Staff

Jodi Magness
Archaeology · University of North Carolina at Chapel Hill · *s*
Funding provided by The Hetty Goldman Membership Fund

Jodi Magness is integrating the literary and archaeological evidence in an attempt to identify distinct sects, groups, and movements among the Jewish population in Palestine in the late Second Temple period (first century BCE to first-century CE).

Peter Alexander Meyers
Intellectual History and Political Theory · Université Paris 3 · *v*

Peter Alexander Meyers aims to remedy widespread misunderstanding of the at once classical and prescient modernist theory of political culture and the rule of law in Rousseau's *Du Contract Social* [sic], as well as continuing work on "rhetoric as inquiry," representations of violence, the public/private distinction, contemporary citizenship, and the modern "will."

Sergey Minyaev
Archaeology and Art History · Russian Academy of Sciences · *s*
Funding provided by The Starr Foundation Fund

Sergey Minyaev's research concerns the excavation of Xiongnu sites in Russia in the Trans-Baikal area that have resulted in a massive accumulation of new information about Xiongnu art and of well-documented artifacts from Xiongnu sites, leading to a new view of the history and archaeology of Central Asia during the Xiongnu period.

Ian Moyer
Ancient History · University of Michigan
Funding provided by The Andrew W. Mellon Foundation

Ian Moyer is examining both Greek and Egyptian sources to reassess the history of political and cultural relations between the Ptolemaic state and the Egyptian elite, exploring, in particular, the creation of a "middle ground" on which indigenes and immigrants negotiated their interests and their positions within the Ptolemaic state.

Uta Nitschke-Stumpf
History of Architecture, History of Berlin · Institute for Advanced Study · *a*

Uta Nitschke-Stumpf is a research assistant to Professor Irving Lavin. Her research interests include German-American relations, the history of Berlin, and architectural history.

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

Members, Visitors, and Research Staff

David O'Brien

Art History · University of Illinois at Urbana–Champaign · *f*
Elizabeth and J. Richardson Dilworth Fellowship in Historical Studies

David O'Brien is working on a book about the French artist Eugène Delacroix's depictions of North Africa. By following the changes in Delacroix's Orientalism over the course of his career, he hopes to reveal something of the shifting desires, demands, and constraints—aesthetic and social—that shaped French artistic depictions of North Africa.

Cormac Ó Gráda

Economic History · University College Dublin · *f*
Funding provided by the Gerda Henkel Stiftung

Cormac Ó Gráda is working on a global history of famine that will cover the following topics: the "horrors" of famine; famine demography; prevention and coping strategies; the role of markets and entitlements; how governments have exacerbated and mitigated famines; "totalitarian" famines; the long-term impact of famine on survivors' health; and future prospects.

Glenn Peers

Art History, Medieval Studies · University of Texas at Austin
George William Cottrell, Jr. Membership

Glenn Peers is working on a book-length project that examines art's role in defining faith and community in the Middle Ages. In addressing different regions of the Mediterranean, he will focus on the active role art played in defending and bridging communities against an "other."

Beate Pongratz-Leisten

Ancient Near Eastern Studies · Princeton University
Funding provided by the National Endowment for the Humanities

Beate Pongratz-Leisten aims to highlight the early beginnings of theological discourse by investigating the various cultic and theological strategies that were used in ancient Mesopotamia to generate and explain divine presence and agency. She argues that the ancient notion of the individual as "persona" had a crucial impact on the shaping of the divine.

Jonathan Rée

Philosophy, Intellectual History · Roehampton University · *f*
Agnes Gund and Daniel Shapiro Membership

Jonathan Rée is working on a detailed description of philosophical activity in the English language, from its beginnings in the sixteenth century to the present. He hopes to revisit moments of individual originality and creativity, revive old senses of ambiguous pasts and open futures, and cast light on what might be called the "agency" of philosophical thought.

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

Members, Visitors, and Research Staff

Denis Rousset
Ancient History · École Pratique des Hautes Études
Funding provided by the Patrons' Endowment Fund

Denis Rousset is working on a book that will gather 440 inscriptions into a critical edition on Phocis (Central Greece), complete with translations and commentaries. He is also working on the translation and commentary of the description of Phocis by Pausanias.

Jutta Schickore
History of Science · Indiana University
Funding provided by The Andrew W. Mellon Foundation

Jutta Schickore is studying how scientists have coped with the imperfections of experiments. Focusing on experimentation in optics and physiology, she hopes to reveal how confusion, noise, limitations, and disturbances have acted as productive forces in knowledge generation.

John Beldon Scott
Art History · University of Iowa · *v, f*

John Beldon Scott is researching mass ritual employed by totalitarian regimes and its impact on urban design in their capital cities. The project focuses on parades along the principal thoroughfares and squares of Rome, Berlin, and Moscow in the 1930s.

Jonathan Skaff
Chinese History · Shippensburg University · *f*
Felix Gilbert Membership

Jonathan Skaff is examining the frequent pragmatic interactions that occurred between nomadic peoples and Tang dynasty civil and military officials stationed in the capital and northern borderlands. The interactions influenced Tang officials to adopt Inner Asian diplomatic and military practices, which ultimately affected the culture and institutions of the Tang government and military.
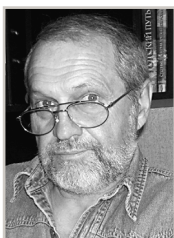
Oleksandr Symonenko
Archaeology · Institute of Archaeology (Ukrainian National Academy of Sciences) · *s*
Funding provided by the Gerda Henkel Stiftung

Oleksandr Symonenko is investigating the elements of Inner Asian nomadic cultures in the Sarmatian culture, who since the third-century BC lived in the Hsiung-nu milieu, had close contacts with China, and were the ancestors of Sarmatians and Alans of the second-century BC to the first-century AD.

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

Members, Visitors, and Research Staff

Cynthia Talbot

South Asian History · University of Texas at Austin
Funding provided by the Fund for Historical Studies

Cynthia Talbot is exploring historical traditions about the twelfth-century king Prithviraj Cauhan, often described as the last Hindu ruler of India. This study of how cultural symbols or historical memories are transmitted and transformed over time will also cast light on India's martial ethos, historical consciousness, and past Hindu-Muslim relations.

Giacomo Todeschini

Medieval History · Università di Trieste · *s*
Funding provided by The Andrew W. Mellon Foundation

Giacomo Todeschini's research concerns the deep connection between the multifaceted medieval notion of "infamy" (resumed by juridical and theological keywords as "*infamia iuris*," "*infamia facti,*" "*indignitas,*" "*infidelitas*") and the gradual construction of a self-doubting European identity from the end of the Middle Ages to the early modern era.

Nancy J. Troy

Art History · University of Southern California · *f*
Funding provided by The Andrew W. Mellon Foundation

Nancy Troy is examining the circumstances in which the Dutch painter Piet Mondrian's mature work was displayed, described, marketed, conserved, publicized, circulated, and manipulated by a variety of interested parties in the months and years that followed his death in New York City in 1944.

Nurit Tsafrir

Medieval Islamic Law · Tel Aviv University
The Martin L. and Sarah F. Leibowitz Membership

Nurit Tsafrir is studying the transition of Sunni Muslim law from its formative to its classical period in the tenth century, concentrating particularly on the Hanafi school, one of the four Sunni schools of law.

Kevin van Bladel

Classics and Arabic/Islamic Studies · University of Southern California · *f*
Funding provided by The Herodotus Fund

Kevin van Bladel's research will test the hypothesis that Arabic annalistic historiography (and its offshoot traditions in other languages such as Persian) is a descendant of late antique Greek chronography through the study of sources hitherto neglected.

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

*Members, Visitors, and Research Staff*
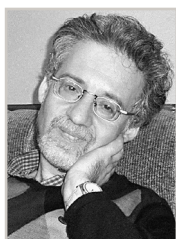
Alexander Verlinsky

Classics, Ancient Philosophy · State University of St. Petersburg,
Bibliotheca Classica Petropolitana · *s*
Edwin C. and Elizabeth A. Whitehead Fellowship

Alexander Verlinsky's research concerns problematic aspects of Plato's, Aristotle's, and Epicurus's views about the origin and growth of human culture. He contends that Plato and Aristotle have much to say on the character of evolution itself, and that Epicurus's views on the subject have not been thoroughly compared with those of his antagonistic predecessors.
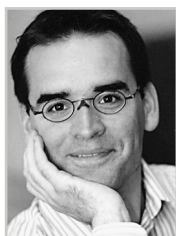
Thomas Weber

Modern European History · University of Pennsylvania
Funding provided by The Herodotus Fund

Thomas Weber aims to produce the collective biography of the men of Hitler's regiment during the First World War. It is the first project to make use of the wealth of the Bavarian War Archive collections, rather than relying on the mythical postwar recollections of Hitler and his comrades.

Witold Witakowski

Semitic Studies · Uppsala University
Funding provided by The Gladys Krieble Delmas Foundation

Witold Witakowski is working on a monograph dealing with events in South Arabia at the beginning of the sixth-century AD that culminated in the persecution of the Christians in the city of Nagran by the Jewish king of Himyar, Yusuf Asa'r Yath'ar, a.k.a. Dhu Nuwas.

Margherita Zanasi

Chinese History · Louisiana State University
Funding provided by the National Endowment for the Humanities

Margherita Zanasi is examining the transformation of Chinese discourse on the economy from the eighteenth to the mid-twentieth century, when China experienced dramatic political changes (the fall of the imperial system and the establishment of a republic) and unprecedented exposure to worldwide trends following defeat in the Opium War.

Graham Zanker

Classics, Hellenistic Poetry · University of Canterbury, New Zealand · *v, f*

Graham Zanker is working on a monograph (with Oswyn Murray) on Ch.G. Heyne's *De Genio Saeculi Ptolemaeorum* (1763), establishing its place in modern concepts of Hellenistic civilization, and an edition of Herodas's *Mimiambs,* in particular placing them within their Hellenistic cultural and historical context.

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

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 was among the School's first Members.

Today, the School is an international center for research on 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 of 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 2007–08 academic year, the School of Mathematics will have two special programs. School Faculty member Jean Bourgain and Van Vu of Rutgers University will lead a program on arithmetic combinatorics during the first term of the year. The program will deal with problems in number theory with combinatorial flavor.

During the academic year, Roman Bezrukavnikov of the Massachusetts Institute of Technology will lead a special program on algebraic geometry and physics in representation theory. In the first term, the emphasis will be on mathematics connected to quantum field theory, in particular the new differential approach to the geometric Langlands program. A part of the second term will be devoted to absorbing the emerging new homotopy foundations of algebraic geometry with a view towards applications. A workshop will be held during each of the two terms.

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

Enrico Bombieri
*IBM von Neumann Professor*

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.

Jean Bourgain
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.
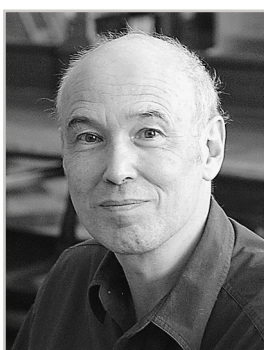
Pierre Deligne
Professor

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 21st problem, Hodge theory, the relations between modular forms, Galois representations and L series, the theory of moduli, tannakian categories, and configurations of hyperplanes.

Faculty

Phillip A. Griffiths
Professor

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 the uses of that subject in modern theoretical physics. In addition to algebraic geometry, Griffiths 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), Professor Griffiths leads the Millennium Science Initiative (MSI) whose primary goal is to create and nurture world-class science and scientific talent in the developing world.

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.

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.

Faculty
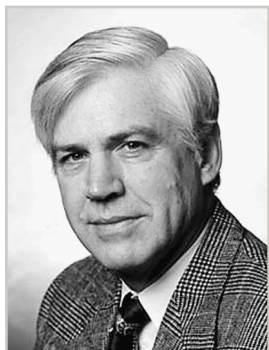
Thomas Spencer
Professor

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.

Vladimir Voevodsky
Professor

Vladimir Voevodsky is known for 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. One consequence of his work is the solution of the Milnor Conjecture. Currently he is interested in categorical probability theory, mathematical population genetics, and automated proof verification. He is working on a new approach to formalization of mathematics based on homotopy lambda calculus. His other interests include wildlife photography and trance music.
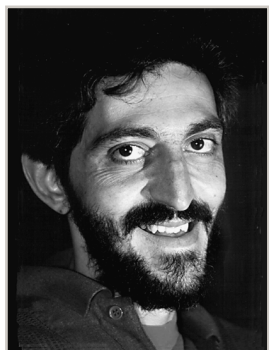
Avi Wigderson
Herbert H. Maass Professor

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)?

Faculty

Robert P. Langlands
Professor Emeritus
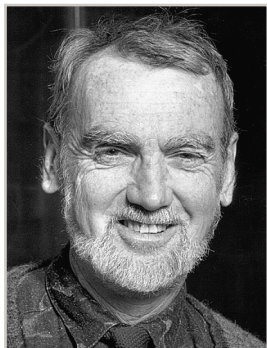
Robert Langlands's profound insights in number theory and representation theory include the formulation of general principles relating automorphic forms and algebraic number theory; the introduction of a general class of L-functions; the construction of a general theory of Eisenstein series; the introduction of techniques for dealing with particular cases of the Artin conjecture (that 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, himself, has spent some of his time in recent years studying lattice models of statistical physics and the attendant conformal invariance.

Members and Visitors

Adi Akavia

Complexity, Coding Theory · Massachusetts Institute of Technology
Funding provided by the State of New Jersey

Adi Akavia is studying problems in cryptography, error correcting codes, and complexity.

Daniel Allcock

Discrete Groups, Algebraic Geometry · The University of Texas at Austin · *s*
Funding provided by the Friends of the Institute for Advanced Study

Daniel Allcock is continuing his research on discrete and finite groups in algebraic geometry, including a possible connection with the monster simple group. He will also work to bring himself up to speed on modern representation theory.

Noga Alon

Combinatorics · Tel Aviv University · *vp, s*

Noga Alon will work on questions in discrete mathematics and theoretical computer science, focusing on problems in extremal and probabilistic combinatorics, property testing, combinatorial geometry, and discrete probability. He expects to combine combinatorial tools with algebraic and probabilistic techniques.

Clark Barwick

Homotopical Algebraic Geometry · University of Oslo · *v, f · s*

Clark Barwick is investigating possible applications of homotopical algebraic geometry—in particular the homotopy theory of D-crystals and chiral algebras in derived algebraic geometry—to the geometric Langlands program.

Dmitri Beliaev

Function Theory · Institute for Advanced Study · *vri*

Dmitri Beliaev will continue to study local properties of harmonic measure and related problems of the geometric function theory. He will study harmonic measure on random clusters, and he will use harmonic measure to study random fractals, and random fractals to construct sets with extremal behavior of harmonic measure.

S C H O O L   O F   M A T H E M A T I C S

f First Term · *s* Second Term · *v* Visitor · *vp* Visiting Professor
j Joint Member School of Natural Sciences · *vri* Veblen Research Instructorship
vnecf von Neumann Early Career Fellow

Members and Visitors

David Ben-Zvi

Geometric Langlands Program · The University of Texas at Austin · *s*

At the Institute, David Ben-Zvi plans to explore the connections between the geometric Langlands program, representation theory of Lie groups, topological field theory, and derived algebraic geometry.

Roman Bezrukavnikov

Representation Theory, D-modules · Massachusetts Institute of Technology
Funding provided by The Ambrose Monell Foundation; The Bell Companies Fellowship; The James D. Wolfensohn Fund; and The Oswald Veblen Fund

Roman Bezrukavnikov is participating in the special year program whose goal is to learn and enhance new connections between representation theory and other fields, such as gauge theory and its generalizations, (derived) algebraic geometry, etc. He will also continue his work on representation theory in prime characteristic and local geometric Langlands duality.

Philip Boalch

Moduli Spaces of Meromorphic Connections · École Normale Supérieure · *f*

Philip Boalch is studying the geometry of moduli spaces of meromorphic connections on G-bundles over complex curves, especially the case of irregular singularities. In particular some questions related to isomonodromic deformations, quantization, and the wildly ramified geometric Langlands correspondence will be considered.

Mitya Boyarchenko

Character Sheaves for Unipotent Groups · University of Chicago · *s*

Mitya Boyarchenko is studying character sheaves for unipotent groups over fields of positive characteristic. He is planning to use character sheaves to understand blocks in the equivariant derived categories of such groups, and to analyze the relationship between character sheaves and characters of unipotent groups over finite fields.

Alexander Braverman

Representation Theory, Algebraic Geometry · Brown University · *s*

Alexander Braverman is participating in the program "New Connections of Representation Theory to Algebraic Geometry and Physics." Specifically, he plans to focus on certain generalization of Langlands theory to affine Kac-Moody groups and its relation to gauge theory.

S C H O O L   O F   M A T H E M A T I C S

Members and Visitors

Emmanuel Breuillard

Ergodic Theory, Number Theory · École Polytechnique · *f*

During his stay at the Institute, Emmanuel Breuillard is hoping to learn some of the new techniques from additive combinatorics in order to apply them to his own research in group theory.

Xi Chen

Game Theory, Complexity Theory · Tsinghua University
Funding provided by the State of New Jersey

Xi Chen continues his study in complexity theory, especially in searching for ways to characterize the computational complexity of natural problems.

Kevin Costello

Combinatorics, Discrete Probability · Rutgers, The State University of New Jersey
Funding provided by the State of New Jersey

Kevin Costello intends to work on questions in discrete probability while at the Institute, and in particular on questions involving the asymptotic behavior of discrete random structures, such as random graphs or random matrices.

Ciprian Demeter

Ergodic Theory, Harmonic Analysis · University of California, Los Angeles

At the Institute, Ciprian Demeter will investigate bilinear singular integral operators and maximal averages lying at the interface between ergodic theory and harmonic analysis. The approach to these problems relies on time-frequency techniques.

Brent Doran

Geometric Invariant Theory · Institute for Advanced Study

Brent Doran will study problems in algebraic geometry such as higher rational connectivity, finite generation of rings, the Zariski cancellation problem, and moduli of bundles and varieties, using techniques from geometric invariant theory and A1-homotopy, with a special focus on non-reductive quotients.

Members and Visitors

Barbara Fantechi

Quantum Cohomology · Scuola Internazionale Superiore di Studi Avanzati, Italy · *s*

During her stay at the Institute, Barbara Fantechi plans to study the relationship between DG schemes and extended deformation functors.

Michael Finkelberg

Quantum Groups · Independent University of Moscow · *s*
Funding provided by The Oswald Veblen Fund

Michael Finkelberg is working on various aspects of two-dimensional geometric Langlands program; more specifically, geometric realization of integrable modules over affine Lie algebras via Uhlenbeck moduli spaces.

Alexander Gamburd

Arithmetic Combinatorics · University of California, Santa Cruz · *vnecf*

At the Institute, Alexander Gamburd plans to work on problems involving interactions between arithmetic combinatorics, expanders, and sieving.

Jayce R. Getz

Number Theory · University of Wisconsin at Madison · *vri*

During his stay at the Institute, Jayce Getz will investigate the arithmetic and geometry of cycles on Shimura varieties. Particular attention will be paid to the relationship of such cycles to functorial transfer in the theory of automorphic representations.

Alexey Glibichuk

Sum-Product Estimates · Moscow State University · *f*

Alexey Glibichuk plans to extend his joint result with Sergei Konyagin on Waring numbers to arbitrary field. He is also planning to acquire new skills in using harmonic analysis in additive combinatorics.

f First Term · *s* Second Term · *v* Visitor · *vp* Visiting Professor
j Joint Member School of Natural Sciences · *vri* Veblen Research Instructorship
vnecf von Neumann Early Career Fellow

S C H O O L   O F   M A T H E M A T I C S

Members and Visitors

Lothar Goettsche

Algebraic Geometry, Mathematical Physics · International Centre for Theoretical Physics · *s*
Funding provided by The Oswald Veblen Fund

Lothar Goettsche's field of interest is moduli spaces in algebraic geometry and their numerical invariants. During his stay at the Institute, Goettsche plans to work on moduli spaces of sheaves on algebraic surfaces and generalizations of Donaldson invariants.

William Goldman

Moduli Spaces · University of Maryland · *s*
Funding provided by The Oswald Veblen Fund

William Goldman will continue his investigation into the representation theory of surface groups in Lie groups, relationship to the moduli of geometric structures on manifolds, geometries on these moduli spaces, and dynamical systems arising from the action of mapping class groups and outer automorphism groups of free groups on deformation spaces.

Mark Goresky

Geometry, Automorphic Forms · Institute for Advanced Study

Mark Goresky's main interest this year concerns the generation of pseudorandom sequences for use in cryptography and spread-spectrum communications. He plans to complete the first draft of his book, *Algebraic Shift Register Sequences*, written jointly with Andrew Klapper.
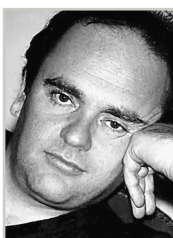
Andrew Granville

Analytic Number Theory · University of Montreal · *f*
Funding provided by The Charles Simonyi Endowment

The recent extraordinary impact of additive combinatorics on analytic number theory has led to exciting breakthroughs in the distribution of prime numbers and on exponential sums. Andrew Granville hopes to use his time at the Institute to help develop further applications to his subject.

Ben Green

Arithmetic Combinatorics · Centre for Mathematical Sciences · *f*

Ben Green will work on various aspects of additive combinatorics. In particular, he will endeavor to further his program of research with Terence Tao concerning the Gowers norms. He also hopes to advance his knowledge of Ratner's theorem and other topics in ergodic theory, with particular reference to finding discrete and quantitative versions of these results.

S C H O O L   O F   M A T H E M A T I C S

Members and Visitors

Sergei Gukov

Representation Theory, Geometry, Physics · University of California, Santa Barbara

At the Institute, Sergei Gukov plans to study physical realization of geometric methods in representation theory and homological knot invariants in four-dimensional gauge theory.

Venkatesan Guruswami

Theory of Computation · University of Washington

Venkatesan Guruswami is interested in a broad array of topics within theoretical computer science. He plans to work on further deepening our understanding of constructions of error-correcting codes, expander graphs, and other "pseudorandom" objects, and their interplay with algebraic methods. He also plans to continue his work on pinpointing the approximability threshold of fundamental NP-hard optimization problems.

Nir Halman

Optimization, Stochastic Programming · Institute for Advanced Study · *v*

During Nir Halman's stay at the Institute, he plans to develop fully polynomial approximation schemes for a wide range of stochastic combinatorial optimization problems. The main tool he will use will be K-approximation sets and functions.

Harald Helfgott

Linear Algebraic Groups · Bristol University · *f*

Harald Helfgott is studying the growth of sets in linear algebraic groups. He would like to relate his current techniques to older results on growth in groups and also to work on new problems in additive combinatorics.

Michael Hochman

Dynamical Systems · The Hebrew University of Jerusalem · *vri*

Michael Hochman's research interests include ergodic theory, topological dynamics, and their applications to information theory and symbolic dynamics. He is currently working on descriptive and information-theoretic aspects of the dynamics of multidimensional symbolic systems.

S C H O O L   O F   M A T H E M A T I C S

Members and Visitors

Atsushi Ichino

Automorphic Forms · Osaka City University

Atsushi Ichino is working on the following problem in the theory of automorphic forms and representation theory: the relation between periods of automorphic forms and special values of automorphic L–functions.

Russell Impagliazzo

Computational Complexity · University of California, San Diego · *vp*
Funding provided by The Charles Simonyi Endowment

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. He plans to continue work with Avi Wigderson and others on applications of additive number theory to constructions of combinatorial objects with random-like properties.

Yukari Ito

Algebraic Geometry · Nagoya University

Yukari Ito is studying algebraic structures of a resolution of quotient singularities and the group representations in terms of orbifold cohomology and the McKay correspondence. Moreover, she wants to see the existence of a crepant resolution of higher dimensional canonical singularities.

Juhi Jang

Fluid Mechanics, Kinetic Theory · Brown University

Juhi Jang is working on the stability theory of Lane-Emden steady stars along the compressible flow driven by the self-gravitation and the viscosity. She will also study the asymptotic relationship between semilinear equations and Minkowski minimal surfaces.

Tali Kaufman

Algorithms · Institute for Advanced Study

Tali Kaufman is using algebraic and analytic tools to study local testability, local decodability, and self correction properties of error correcting codes, with an aim of finding new tools for correcting programs.

S C H O O L   O F   M A T H E M A T I C S

Members and Visitors

Dubi Kelmer

Number Theory, Quantum Chaos · Tel Aviv University

Dubi Kelmer plans to work on problems in quantum chaos, that is, the study of semiclassical properties of quantum systems with an underlying chaotic classical dynamics. In particular, he intends to work on questions of "quantum ergodicity" on multidimensional models coming from arithmetics.

Mikhail Khovanov

Geometric Representation Theory · Columbia University · *vnecf*

Mikhail Khovanov will study the interrelation between link homology, TQFTs, homological algebra, geometric representation theory, and the Langlands program.

Rowan Killip

Spectral Theory, Random Matrices · Institute for Advanced Study

Rowan Killip is interested in a variety of topics from mathematical physics: random matrices, integrable systems, and the (non)linear Schrödinger equation. While at the Institute, his main lines of investigation will concern the behavior of eigenvalues under small random perturbations and the behavior of the mass-critical nonlinear Schrödinger equation.

Sergei Konyagin

Harmonic Analysis · Moscow State University · *f*
Funding provided by The Oswald Veblen Fund

Sergei Konyagin plans to study additive and multiplicative properties of subsets of residues using combinatorial and analytic arguments.

Dong Li

Mathematical Physics, Fluid Dynamics · Institute for Advanced Study

At the Institute, Dong Li will work on interrelated problems in molecular dynamics, mathematical physics, and fluid dynamics.

<div style="text-align:right">S C H O O L   O F   M A T H E M A T I C S</div>

f First Term · *s* Second Term · *v* Visitor · *vp* Visiting Professor
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vnecf von Neumann Early Career Fellow

Members and Visitors

SCHOOL OF MATHEMATICS

Elon Lindenstrauss

Ergodic Theory · Princeton University · *f*

Elon Lindenstrauss's field of study is ergodic theory dynamical systems: particularly the study of concrete systems whose behavior relates to number theory or automorphic forms. Lindenstrauss plans to study the interrelations between these problems and recent advances in arithmetic combinatorics.

Alina Marian

Algebraic Geometry, Representation Theory · Yale University

Alina Marian is interested in algebraic geometry and its connections with mathematical physics. During her stay at the Institute, she plans to study in particular the geometry and representation theory of moduli spaces of sheaves on varieties.

William A. Massey

Dynamical Queueing Systems · Princeton University

At the Institute, William Massey will continue his study of random measures, the asymptotic theory of strong approximations for Lévy processes, and the dynamical optimization methods of Lagrange, Hamilton, and Bellman. He plans to develop a book on new techniques to analyze stochastic queueing models from a dynamical systems perspective.

Kevin McGerty

Modular Representation Theory, Geometry · Imperial College · *s*

Kevin McGerty is studying modular representation theory of quantum groups and algebraic groups via constructible geometry. He is also interested in the theory of character sheaves and Hall algebras.

Emanuel Milman

Asymptotic Geometric Analysis, Convex Geometry · The Weizmann Institute of Science

During Emanuel Milman's stay at the Institute, he plans to investigate several volumetric properties of convex domains in Euclidean space, such as the spectral gap of the Neumann Laplacian, other isoperimetric and concentration inequalities, and the slicing problem for convex bodies.

Members and Visitors

Ivan Mirkovic

Group Representations · University of Massachusetts
Funding provided by The Ellentuck Fund

Ivan Mirkovic intends to study interrelation of quantum field theory, geometric Langlands program, and number theory from the point of view of his background in geometric representation theory. While the mathematical verification of specific predictions coming from physics continues to be very fruitful, Mirkovic is particularly interested in the mathematical structure of quantum field theory and understanding the "way physicists think."

Sophie Morel

Shimura Varieties · Institute for Advanced Study

Sophie Morel is studying the automorphic representations appearing in the intersection cohomology of the Baily-Borel compactification of Shimura varieties. One of her main tools will be Arthur's stable trace formula.

David Nadler

Representation Theory, Algebraic Geometry, Physics · Northwestern University · *s*

David Nadler plans to study new developments in the relationship between topological field theory and representation theory. In particular, he hopes to better understand the interplay of the two subjects in the context of the geometric Langlands program.
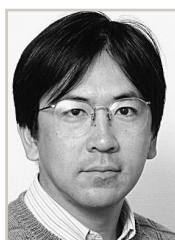
Hiraku Nakajima

Geometry, Representation Theory · Kyoto University
Funding provided by the Friends of the Institute for Advanced Study

Hiraku Nakajima is studying the interplay between the geometry of quiver varieties or instanton moduli spaces on 4-manifolds, and the representation theory of quantum groups.

Melvyn Nathanson

Additive Combinatorics · City University of New York–Lehman College · *v, f*

Melvyn Nathanson will work on problems in additive and combinatorial number theory, and connections between number theory and various universal objects, such as Urysohn space. He also expects to complete the fourth and fifth volumes of a series of monographs on additive number theory (the first three were written during previous visits to the Institute).

S C H O O L   O F   M A T H E M A T I C S

Members and Visitors
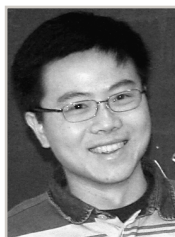
Bao Châu Ngô
Algebraic Geometry, Group Theory · Université de Paris 11
Funding provided by The Charles Simonyi Endowment

At the Institute, Bao Châu Ngô plans to work on the redaction of an article on the Langlands–Shelstad's fundamental lemma.

Tuan Ngô Dac
Algebraic Geometry · Université de Paris 13 · *s*
Funding provided by The Charles Simonyi Endowment

Tuan Ngô Dac is working on the geometry of the stacks of shtukas and its related subjects. He is also interested in the Hitchin fibration and its connection with the trace formula.

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

Dmitri Orlov plans to study different aspects of homological mirror symmetry: relations between derived categories of coherent sheaves on varieties and categories of Lagrangian vanishing cycles for mirror symmetric Landau-Ginzburg models; descriptions of categories of Dbranes for Landau-Ginzburg models; and constructions of mirror symmetric models for some Fano varieties and varieties of general type.

Victor Ostrik
Character Sheaves, Tensor Categories · University of Oregon · *f*
Funding provided by The Oswald Veblen Fund

Victor Ostrik is working on the theory of tensor categories and its relations with representation theory. In particular, he plans to study the tensor structures related with the theory of character sheaves.

Dinh Huong Pham
Algebraic Geometry · Université de Paris 11 · *f*
Funding provided by The Weyl Fund

Dinh Huong Pham is studying the geometric interpretation of the geometric side of the trace formula. She wishes to construct an analogue of Hitchin fibration in the case of Lie groups instead of Lie algebras.

Members and Visitors

Anup Rao

Theoretical Computer Science · University of Texas at Austin

During Anup Rao's stay at the Institute, he plans to seek answers to various questions in computational complexity. Anup is particularly interested in the construction of randomness extractors and in the design of pseudorandom objects.

Alexander Razborov

Combinatorics, Computer Science · Institute for Advanced Study · vp

Alexander Razborov will work in the area of combinatorics, notably in its branches known as extremal combinatorics and arithmetic combinatorics. He also plans to revisit several areas in theoretical computer science, including proof complexity and possibly quantum computing.

Simon Riche

Algebraic Groups, Lie Algebras · Université de Paris 6 · s

At the Institute, Simon Riche will participate in the special year, "New Connections of Representation Theory to Algebraic Geometry and Physics." He will work on the geometric approach to representation theory of Lie algebras in prime characteristic, via D-modules and coherent sheaves.

Leonid Rybnikov

Quantum Systems, Kac-Moody Algebras · Institute for Theoretical and Experimental Physics

Leonid Rybnikov plans to study the connection between Bethe ansatz for generalized Gaudin quantum integrable models (associated to finite-dimensional simple Lie algebras) and opers on the projective line having regular or irregular singularities at finite number of points. He hopes to generalize this connection to some KdV-type systems associated to affine Kac-Moody algebras.

Alireza Salehi Golsefidy

Semisimple Lie Groups · Institute for Advanced Study · vri

Alireza Salehi Golsefidy is working on various topics centering at semisimple Lie groups, such as homogeneous dynamical system, its application in number theory, action of discrete subgroups on the Bruhat-Tits building, and studying the lattices of minimum covolume in various semisimple Lie groups.

Members and Visitors
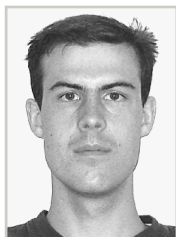
Tom Sanders

Additive Combinatorics · University of Cambridge

The problems that Tom Sanders studies typically arise in the areas of harmonic analysis and combinatorial number theory; they are more aptly defined as those questions that are susceptible to attack through the development of a suitable dichotomy between "structure" and "randomness."

Olivier Schiffmann

Geometric Representation Theory · École Normale Supérieure · *s*
Funding provided by the Friends of the Institute for Advanced Study

Olivier Schiffmann is exploring the possibility of defining affinization of various structures in geometric representation theory, such as Lusztig's theory of character sheaves, the affine Grassmanian, et al., using the geometry of vector bundles on curves.

Sug Woo Shin

Number Theory, Shimura Varieties · Harvard University

Sug Woo Shin would like to investigate the Langlands correspondence as realized in the cohomology of Shimura varieties (global) or Rapoport-Zink spaces (local). The techniques will range from arithmetic geometry to the trace formula and endoscopy.

Ilya Shkredov

Number Theory, Ergodic Theory · Moscow State University · *f*

Ilya Shkredov plans to obtain the analogues Roth's theorem on arithmetic progressions in the multidimensional case and prove structural results on the sets of large exponential sums. One of his main tools will be Fourier transform and theory of graphs.

Lior Silberman

Locally Symmetric Spaces · Harvard University

Lior Silberman will study asymptotic properties of eigenfunctions on locally symmetric spaces, especially with a view of applications to number theory, as well as the spectral and geometrical properties of random groups.

f First Term · *s* Second Term · *v* Visitor · *vp* Visiting Professor
j Joint Member School of Natural Sciences · *vri* Veblen Research Instructorship
vnecf von Neumann Early Career Fellow

Members and Visitors

Jozsef Solymosi
Combinatorics · University of British Columbia · *f*
Funding provided by The Charles Simonyi Endowment

Jozsef Solymosi plans to study problems in incidence geometry with applications to additive combinatorics. At the Institute, Solymosi will work on two problems: the distinct distances problem and the sum-product problem over various fields, both central in additive combinatorics.

Catharina Stroppel
Representation Theory · University of Glasgow · *vnecf*
Funding provided by the Minerva Research Foundation

Catharina Stroppel is working on categorification in connection with representation theory and geometry and focusing on derived categories of coherent sheaves and Fukaya categories in relation to Khovanov homology. She would like to clarify the connection between classical Lie theory and symplectic geometry.

Benjamin Sudakov
Combinatorics, Number Theory · Princeton University · *f*

Benjamin Sudakov is interested in algebraic and probabilistic methods in discrete mathematics, extremal combinatorics, combinatorial number theory, and application of combinatorics to theoretical computer science. He plans to participate in the activities of the special semester on arithmetic combinatorics.

Endre Szemerédi
Number Theory, Graph Theory · Rutgers, The State University of New Jersey · *f*
Funding provided by The Ellentuck Fund

Endre Szemerédi is working on extremal graph theory and additive combinatorics. He plans to work on problems related to Freiman theorem and problems about the sum-product theorem.

Dinesh Thakur
Number Theory, Algebraic Geometry · University of Arizona · *s*
Funding provided by The von Neumann Fund and The Ellentuck Fund

During Dinesh Thakur's stay at the Institute, he will work on understanding mathematical structures related to function field multizeta values that he has defined, and will work on the elaboration of the related concept of function field Ihara power series developed with Greg Anderson.

f First Term · *s* Second Term · *v* Visitor · *vp* Visiting Professor
j Joint Member School of Natural Sciences · *vri* Veblen Research Instructorship
vnecf von Neumann Early Career Fellow

Members and Visitors

Valerio Toledano Laredo

Quantum Groups · Northeastern University · *f*

Valerio Toledano Laredo is studying the relevance of the Casimir connection to conformal field theory and Bridgeland's space of stability conditions on a triangulated category. He also plans to better understand the relation of the description of its monodromy in terms of quantum groups to the quantum Langlands correspondence.

Luca Trevisan

Computational Complexity · University of California, Berkeley · *f*

Luca Trevisan is working on applications to computer science of techniques from additive combinatorics, as well as on problems in computational complexity related to approximation algorithms and to pseudorandomness.

Corinna Ulcigrai

Dynamical Systems, Ergodic Theory · Princeton University · *s*
Funding provided by The Giorgio and Elena Petronio Fellowship Fund

During her stay at the Institute, Corinna Ulcigrai will work on problems interrelating ergodic theory, number theory, and geometry. Her current research interests are in dynamical systems, in particular spectral theory of interval exchange transformations and dynamics in Teichmueller spaces.

Monica Visan

Nonlinear PDE · Institute for Advanced Study

Monica Visan works in harmonic analysis and dispersive PDE, with a particular focus on nonlinear Schrödinger equations. The problem she is most eager to solve is global wellposedness and scattering for the cubic NLS in three space dimensions.

Vadim Vologodsky

Algebraic Geometry · University of Chicago · *s*

Vadim Vologodsky will work on the theory of D-modules in characteristic p. In particular, generalizing a construction of Faltings, he plans to develop a theory of Hodge D-modules in positive characteristic.

Members and Visitors

Van Vu

Combinatorics · Rutgers, The State University of New Jersey · *f*
Funding provided by The Charles Simonyi Endowment

Van Vu's research concerns combinatorics, additive number theory, and probability.

Benjamin Webster

Representation Theory, Field Theory · University of California, Berkeley

During Benjamin Webster's stay at the Institute, he plans to think about connections of applications of representation theory and algebraic geometry in knot theory (in particular, knot homology) and combinatorics, especially through the geometry of symplectic and Poisson varieties.

Andrew Wiles

Algebraic Number Theory · Princeton University · *v*

Andrew Wiles is working primarily on two projects at the moment. The first concerns the solvability of equations in more than one variable. In one variable Abel proved that most equations are not solvable, but the corresponding result in more than one variable is unknown. The second is a long-term project to understand the problem of functoriality in Langlands's theory of automorphic representations.

Julia Wolf

Arithmetic Combinatorics · University of Cambridge · *f*

Julia Wolf's research focuses on arithmetic structures in dense sets of integers and combines Fourier analytic, combinatorial, and probabilistic methods. During her stay at the Institute, she intends to work toward a deeper understanding of Gowers uniformity by exploiting the connections with recent results in ergodic theory.

Sergey Yekhanin

Complexity Theory · Massachusetts Institute of Technology

Sergey Yekhanin's research interests lie in computational complexity theory, cryptography, and the theory of error-correcting codes. He plans to work on matrix rigidity and on constructions of subsets of integers without three-term arithmetic progressions.

Members and Visitors

Bei Zhang
Number Theory · Columbia University

Bei Zhang's interest is in the application of Eisenstein series on Iwasawa theory. During her stay at the Institute, she plans to continue the computation of Fourier-Jacobi coefficients of Eisenstein series on unitary groups and study the arithmetic properties of these coefficients.

Xiaoyi Zhang
Nonlinear Equations, Harmonic Analysis · Academy of Mathematics and System Sciences

During Xiaoyi Zhang's stay at the Institute, she will mainly work on the wellposedness, the scattering theory, and the blow-up properties of nonlinear Schrödinger equations.

S C H O O L   O F   M A T H E M A T I C S

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, string theory, quantum theory and quantum gravity and their relationship to geometry and theoretical and observational astrophysics. The astrophysics group employs both classical and quantum physics techniques, combined with modern observational studies, to investigate the origin and composition of the universe. The research in mathematical physics and string theory benefits from a strong synergistic activity involving the School of Mathematics and the School of Natural Sciences. The programs in physics and astronomy are closely integrated with the 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. 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 who attend lectures and working sessions on the latest advances and open questions in the field of theoretical physics.

Faculty
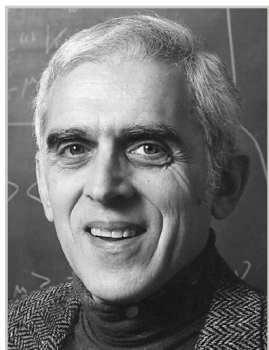
Stephen L. Adler
Professor · Particle Physics

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.
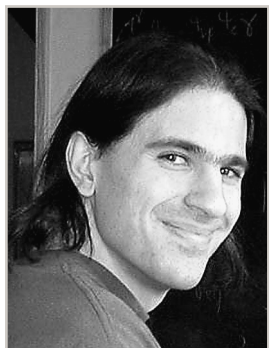
Nima Arkani-Hamed *(from January 1, 2008)*
Professor · Particle Physics

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 (LHC) at CERN in Switzerland, which is scheduled to start up in May 2008.
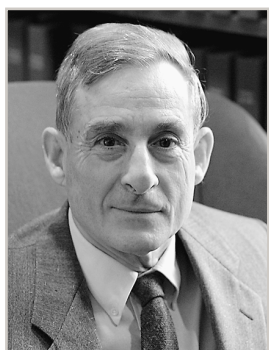
Peter Goldreich
Professor · Astrophysics

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, and turbulence in magnetized fluids. His current research is focused on planet formation.

Faculty

Arnold J. Levine
Professor · Biology

Arnold Levine is a widely acclaimed leader in cancer research. In 1979, Professor 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.
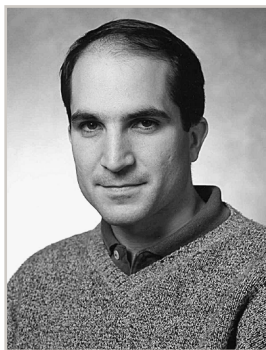
Juan Maldacena
Professor · Theoretical Physics

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, which 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 is also exploring the connection between string theory and cosmology.
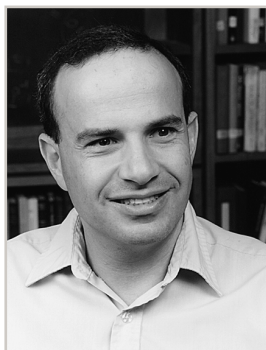
Nathan Seiberg
Professor · Mathematical Physics

Nathan Seiberg's work focuses on various aspects of string theory, field theory, and particle physics. In recent years he has found with various collaborators exact solutions of supersymmetric quantum field theories and string theories. These solutions have applications to mathematics, and to the dynamics of quantum field theories and string theory, leading to many new and unexpected insights; one is the fundamental role played by the "duality" between electricity and magnetism in these theories.

Faculty

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 Professor Peter Goldreich, 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.
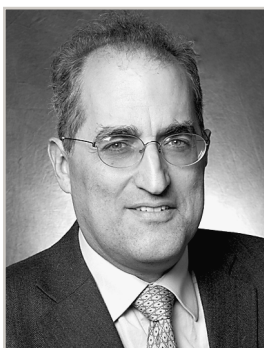
Edward Witten

Charles Simonyi Professor · Mathematical Physics

Edward Witten's work exhibits a unique combination of mathematical power and physics insight, and his contributions have greatly enriched both fields. He is largely responsible for the modern interest in superstrings as a candidate theory for 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.
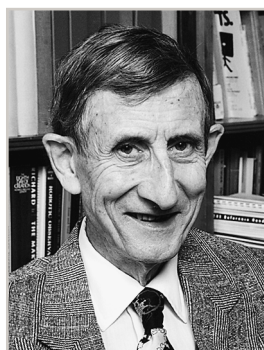
Freeman J. Dyson

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.

Members, Visitors, and Research Staff

Prashanth A.K.

Biology · Institute for Advanced Study · *s*

Prashanth A.K.'s research program aims to elucidate general principles underlying complex behavior of biological systems. He focuses on how DNA structural properties (specifically, destabilization of the DNA duplex) determine fundamental biological mechanisms, by examining the interaction of such properties with other biological features to mediate biological system-level behavior.

Gurinder Atwal

Biology · Institute for Advanced Study

Gurinder Atwal will continue to develop and use tools from statistical mechanics and information theory to address problems in population genetics and association studies. He will study haplotype structure and selection of genes in the p53 pathway, and also seek to uncover epistatic interactions between single nucleotide polymorphisms related to cell apoptosis.

Vijay Balasubramanian

Particle Physics, Biology · University of Pennsylvania
Helen and Martin Chooljian Member

Vijay Balasubramanian's current work in string theory focuses on the physics of black holes and the Big Bang, the "emergence" of space and time from a complex underlying configuration space, and the quest to construct realistic predictive models of particle physics and cosmology from string theory. His current work in neuroscience attempts to give a theory of the structural and functional design of the visual pathway.

Anirban Basu

Mathematical and Particle Physics · Institute for Advanced Study
William D. Loughlin Membership

Anirban Basu wants to understand higher derivative corrections in the effective action of toroidally compactified string/M theory. Apart from unravelling the role of perturbative and nonperturbative states, which constrain the coefficients of the various operators, this will also fix the modular forms of the various U duality groups.

Vladimir Belyi

Biology · Institute for Advanced Study

Vladimir Belyi is interested in the role of electrostatic interactions and local environment in the evolution of genetic sequences, optimization of genetic data, and stability of structural elements of cells and viruses.

Members, Visitors, and Research Staff

Oren Bergman

Particle Physics · Technion University

Oren Bergman's main interests are in fundamental aspects of string theory and in the application of string theory to problems in gauge field theories. While at the Institute, he will continue to explore the role played by tachyons in string theory, and in particular in closed string theory. He will also continue to study string theory models for gauge theories with fundamental matter, with the aim of gaining new insight into the phase structure of QCD in extreme conditions.

Gyan Bhanot

Biology · Rutgers, The State University of New Jersey, and The Cancer Institute of New Jersey · *v*

Gyan Bhanot's research concerns computational biology related to cancer. He uses microarray, mass spectrometry and SNP polymorphism data to identify, quantify, and explain cancer initiation, progression, and metastasis. He also works in evolutionary genetics: including human migration, phylogeny, disease association studies, and patterns of mutations correlated with longevity and complex disease phenotypes.

Niels Emil Jannik Bjerrum-Bohr

Mathematical and Particle Physics · Institute for Advanced Study

N. Emil J. Bjerrum-Bohr is investigating the recent conjecture of supersymmetric Yang-Mills as a topological string theory in twistor space, and continuing his computations of amplitudes relevant to understanding the physics and phenomenology in and beyond the Standard Model as well as in quantum gravity.

Gareth Bond

Biology · Institute for Advanced Study

The goal of Gareth Bond's work at the Institute is to gain a better understanding of the contribution of germline genetics to both the susceptibility to and the progression of cancer. He will be integrating computational, molecular, cellular, and human genetic approaches to identify and study functional high-frequency genetic variations in biologically relevant signaling pathways.

Chang S. Chan

Biology · Institute for Advanced Study

Chang Chan's research focuses on the role gene regulation plays in cancer and other diseases. MicroRNAs comprise a class of short RNAs that inhibit translation of their target mRNAs. He is using comparative genomics and the integration of diverse genome-wide experiments to predict the microRNAs and their cognate targets to help in understanding their biological functions as well as their association with various diseases.

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

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SCHOOL OF NATURAL SCIENCES

Members, Visitors, and Research Staff

Doron Chelouche

Astrophysics · Institute for Advanced Study · *f*

Doron Chelouche is exploring the physics of various astronomical phenomena by studying their spectra. Specifically, he will investigate how accreting systems shed their mass via gaseous outflows, and probe the properties of gas in the halos of galaxies and quasars. He will continue to study the fundamental physics of photoionized gas.

Shane Davis

Astrophysics · Institute for Advanced Study

While at the Institute, Shane Davis plans to work on a broad list of problems within the field of high-energy astrophysics. This includes a continuing emphasis on the study of accreting black hole systems and the nature of their emission mechanisms.

Radovan Dermisek

Particle Physics · Institute for Advanced Study

Radovan Dermisek will continue to work on theoretical and phenomenological aspects of models beyond the standard model of particle physics. He is mainly focused on ideas that are related to the understanding of electroweak symmetry breaking and that can solve the hierarchy problem. These include supersymmetry, models with extended Higgs sector, and grand unified theories. He is also interested in understanding of quark and lepton masses, and neutrino masses and mixing.
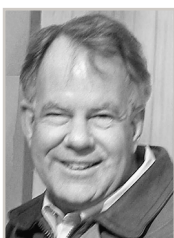
S. Michael Fall

Astrophysics · Space Telescope Science Institute
Funding provided by The Ambrose Monell Foundation

S. Michael Fall is an astrophysicist with expertise in the following fields: formation and structure of galaxies, formation and structure of star clusters, cosmology and large-scale structure, interstellar and intergalactic media, and nucleosynthesis and chemical evolution.
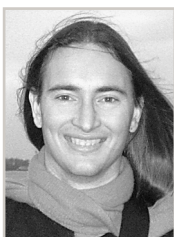
Davide Gaiotto

Particle Physics · Harvard University

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.

Members, Visitors, and Research Staff

Simeon Hellerman

Mathematical and Particle Physics · Institute for Advanced Study · *m*

Simeon Hellerman is exploring models of particle physics and gravity that are capable of describing all currently observed natural phenomena and predicting new ones. He continues to work on models of string theory with broken supersymmetry.

Kevin Heng

Astrophysics · University of Colorado

Kevin Heng's research interests are in supernova remnants, shocks, gamma-ray bursts, and the general application of physics to astrophysical phenomena. He is involved in the study of shocks in Balmer-dominated supernova remnants (SNRs), including SNR 1987A, dust echoes from gamma-ray bursts and Lyman-alpha nebulae around high-redshift radio galaxies, and is a part of observational campaigns to study these objects.

Mario Juric

Astrophysics · Institute for Advanced Study
Frank and Peggy Taplin Membership

Mario Juric's current area of research is the dynamics of few-body systems. During his stay at the Institute, he will numerically investigate the long-term evolution of planetary systems, with the goal of understanding and explaining the observed properties of extrasolar planets.

Gordon Kane

Particle Physics · University of Michigan, Ann Arbor · *f*
Funding provided by The Ambrose Monell Foundation

Gordon Kane is active in several areas beyond the Standard Model: string phenomenology, supersymmetry, Higgs physics, dark matter, particle cosmology, and collider physics. At the Institute, Kane will work on extending and applying his G2 compactification approach, extending his LHC-string theory analysis, and strengthening the basis of his approach to the cosmological constant problems and inflation.

Uri Keshet

Astrophysics · Institute for Advanced Study

At the Institute, Uri Keshet will explore topics in high-energy astrophysics, such as the physical processes involved in collisionless shock waves. He will also continue his work on black hole spectroscopy.

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

Members, Visitors, and Research Staff
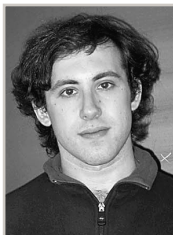
Michael Krasnitz

Biology · Institute for Advanced Study · *m*

At the Institute, Michael Krasnitz will continue to work on the bioinformatics of the influenza virus, focusing on what the evolution of virus sequences can tell us about functional properties such as segment reassortment and packaging. Additional work involves sequence optimization for the development of improved HIV and influenza vaccines.

Michael Kuhlen

Astrophysics · Institute for Advanced Study
The Ralph E. and Doris M. Hansmann Membership

Michael Kuhlen continues to investigate the formation of structure in the universe, using both analytical methods as well as large scale numerical simulations. In particular, he is interested in the dark matter substructure of our galaxy, the formation of the first luminous objects, and feedback processes before and during reionization.
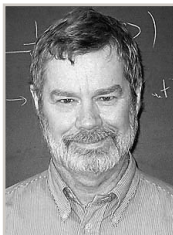
Paul Langacker

Particle Physics · Institute for Advanced Study
Funding provided by the Friends of the Institute for Advanced Study

Paul Langacker will explore the physics implications of concrete string constructions. This will include possibilities for extended gauge, Higgs, fermion, and quasi-hidden sectors for collider physics, and nonstandard mechanisms for generating neutrino mass.

Rachel Mandelbaum

Astrophysics · Institute for Advanced Study

Rachel Mandelbaum continues to work in the field of weak gravitational lensing. Her work includes an analysis of data to answer a variety of astrophysical questions, and development of techniques for using lensing as a probe of cosmological parameters.

Dario Martelli

Mathematical and Particle Physics · Institute for Advanced Study

Dario Martelli continues to develop his approach to the AdS/CFT correspondence. He is also exploring aspects of Sasaki-Einstein and Calabi-Yau geometry as a framework for studying the correspondence.

Members, Visitors, and Research Staff

Patrick Meade
Particle Physics · Harvard University

Patrick Meade's research concerns theoretical high-energy physics. He is primarily focused on ideas related to the upcoming experiments at the Large Hadron Collider (LHC). Additionally, he continues to explore connections between particle physics and cosmology.

Satoshi Mishima
Particle Physics · Institute for Advanced Study

Satoshi Mishima is studying phenomenological aspects of theoretical particle physics. In particular, he will explore the flavor structure of various new physics models, such as supersymmetric standard models.

Jonathan Mitchell
Astrophysics · University of Chicago

Jonathan Mitchell's current interests are in attributing physical mechanisms to observed phenomena in planetary atmospheres. At the Institute, he will continue his work on planetary atmospheres, and will expand this to other planetary and astrophysical phenomena.

Andrew Neitzke
Particle Physics · Institute for Advanced Study
Martin A. and Helen Chooljian Membership

At the Institute, Andrew Neitzke is studying mathematical aspects of string theory. In particular he is working on the problem of constructing a nonperturbative generalization of the topological string, and associated questions related to the quaternionic geometry of supergravity theories.

Donal O'Connell
Particle Physics · California Institute of Technology

Donal O'Connell expects that his research for the year will focus on general features of new physics that might be discovered at the LHC. Some examples are sources of CP violation, and new physics associated with stabilizing the Higgs mass.

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

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Members, Visitors, and Research Staff

Margaret Pan

Astrophysics · Institute for Advanced Study
Association of Members of the Institute for Advanced Study (AMIAS)
Membership

Margaret Pan is exploring solar system dynamics, extrasolar planets, the Kuiper belt, and relativistic self-similar solutions.
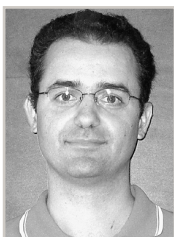
Michele Papucci

Particle Physics · University of California, Berkeley

During Michele Papucci's stay at the Institute, he will continue to work on particle physics, with particular interest on models of electroweak symmetry breaking and how they can be tested using data coming from collider experiments.
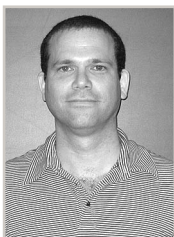
Gil Paz

Particle Physics · Institute for Advanced Study

Gil Paz will work on projects related to observing and studying new physics at the LHC. He will also continue to work on inclusive B decays and their implications for extracting standard model parameters and constraining models of new physics.

Martin Pessah

Astrophysics · University of Arizona

Martin Pessah's work concerns the physical properties of turbulent magnetized flows: developing theoretical accretion disk models for which angular momentum transport is mediated by magneto-hydrodynamic turbulence driven by the magneto-rotational instability; and understanding the similarities exhibited by the global spectral and timing properties of accreting binary systems and active galactic nuclei.

Raúl Rabadán

Biology · Institute for Advanced Study
Martin A. and Helen Chooljian Membership in Biology

Raúl Rabadán uses large databases of viral genome sequences to investigate the patterns of the evolution of Influenza A, an RNA virus that infects birds and mammals. He analyzes the evolutionary rates, the reassortment rates, the patterns of evolution in different hosts, the molecular biology of interactions with the host, and the assembly of the virus. Other interests include retroviruses, cancer, and patterns in graphs.

S C H O O L   O F   N A T U R A L   S C I E N C E S

Members, Visitors, and Research Staff

Pierre Ramond

Particle Physics · University of Florida · *f*
Funding provided by The Ambrose Monell Foundation

A particle physicist, Pierre Ramond is currently interested in using finite groups to explain the pattern of masses and mixings of the elementary particles. He is also working on the light-cone formulation of maximally supersymmetric field theories. During his stay at the Institute, he intends to finalize a book on group theory.
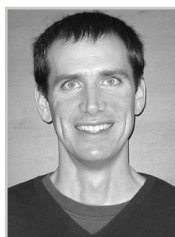
Todd Riley

Biology · Rutgers, The State University of New Jersey · *r*

Todd Riley is working on methods for modeling the binding characteristics of proteins to nucleic acids. His work focuses on the p53 tumor suppressor pathway in the hopes of increasing our knowledge of cancer prevention and treatment.

Douglas Rudd

Astrophysics · University of Chicago

Douglas Rudd is using large-scale computer simulations to study the growth and evolution of clusters of galaxies, and explore their use as a probe of dark energy.

Martin Schnabl

Mathematical and Particle Physics · Institute for Advanced Study

Martin Schnabl's research focuses on central questions of string theory and particle physics. While carrying on active research within string field theory, he will pursue other promising directions as well.

Alexia Schulz

Astrophysics · University of California, Berkeley

While at the Institute, Alexia Schulz will examine astrophysical probes of large scale structure in the universe to discover signatures that may shed light on the interplay between dark matter, baryonic matter, and dark energy in the formation processes of galaxies and clusters of galaxies.

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

Members, Visitors, and Research Staff
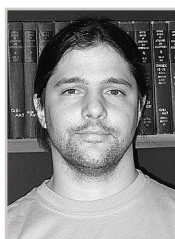
Aldo Serenelli

Astrophysics · Institute for Advanced Study · m
John Bahcall Fellowship

Aldo Serenelli's work concerns modeling late evolutionary stages of low and intermediate mass stars, with emphasis on nucleosynthesis processes occurring during these phases. He is also working on detailed models of the solar structure and has started a project aimed at determining the solar interior composition using solar models and helioseismology data.

Alfred Shapere

Particle Physics · University of Kentucky
Funding provided by The Ambrose Monell Foundation

Al Shapere's interests in string theory, quantum gravity, and gauge theories range from formal to phenomenological. At the Institute, he is exploring connections between gauge theories and strings and seeking signatures of extra dimensions in cosmic rays and at the LHC.
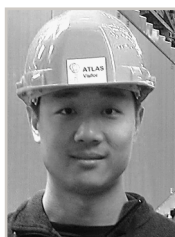
David Shih

Particle Physics · Harvard University

David Shih is working on particle phenomenology and collider physics at the Institute, with a focus on building models to describe the eagerly anticipated flood of data from the LHC.

Stanislav Shvartsman

Biology · Princeton University · s

Stanislav Shvartsman is interested in the quantitative analysis of embryonic development. He is using a variety of analytical and computational tools and uses Drosophila as the main experimental system to test his predictions. During his stay at the Institute, he is planning to work on a book on nonlinear dynamics in chemistry and biology.

Jun Song

Biology · Institute for Advanced Study

Jun Song's research focuses on computational approaches to understanding gene regulation in humans. He is particularly interested in studying how chromatin structure influences transcriptional activities in cancer.

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

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Members, Visitors, and Research Staff

Andrei Starinets

Particle Physics · University of Southampton

At the Institute, Andrei Starinets will continue his work on gauge/gravity duality at finite temperature and density. He will study nonequilibrium properties of strongly coupled plasmas using methods of string theory, holography, and black hole physics.

Gustavo Stolovitsky

Biology · IBM T. J. Watson Research Center · *s*

Gustavo Stolovitzky works on different areas of computational biology and systems biology. His interests revolve around the development of algorithms for data mining of biological data, reverse engineering biological circuits, and modeling of biological processes. During his stay at the Institute, he plans to explore plausible consequences of oscillations in biological systems.

Ian Swanson

Mathematical and Particle Physics · Institute for Advanced Study
Marvin L. Goldberger Membership

Ian Swanson will continue to study various aspects of string theory, gauge theory, and theoretical cosmology. His work includes investigations of the AdS/CFT correspondence and integrable systems, exact solutions of closed-string tachyon condensation, and new dynamical transitions among string theories that arise from these solutions.

Yuji Tachikawa

Mathematical and Particle Physics · University of Tokyo
Carl and Toby Feinberg Member

As a postdoctoral fellow at the Institute, Yuji Tachikawa will continue his research on the superstring theory. He mainly works on the effective Lagrangian of supersymmetric compactifications, which will help uncover the quantum effect of gravity coupled with matter.

Meng-Chwan Tan

Particle Physics · National University of Singapore

Meng-Chwan Tan is exploring the relevance of twisted sigma models and chiral differential operators in the conformal field-theoretic approach to the geometric Langlands conjecture. He is also looking at analogous extensions of the gauge-theoretic approach to the Langlands conjecture with ramification, or any other topic at the interface of physics and contemporary mathematics.

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

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Members, Visitors, and Research Staff
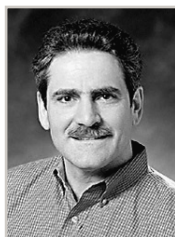
Salvatore Torquato
Particle Physics · Princeton University

Salvatore Torquato continues to work on the problem of the determination of the densest sphere packings in high-dimensional Euclidean spaces, and its connection to condensed matter theory and statistical mechanics. In addition, he is working on the second edition of his book *Random Heterogeneous Materials: Microstructure and Macroscopic Properties.*

Tanmay Vachaspati
Particle Physics · Case Western Reserve University

Tanmay Vachaspati's research interests include cosmology, topological defects, and gravitational physics. During his stay at the Institute, he plans to study the formation of black holes, the generation of cosmic magnetic fields, and the properties of non-Abelian magnetic monopoles.

Glenn van de Ven
Astrophysics · Institute for Advanced Study

Glenn van de Ven is investigating the dynamical structure and evolution of galaxies and globular clusters through detailed modeling of their observed photometry and two-dimensional kinematics. The three-dimensional reconstructions provide a look inside these stellar systems and allow the search for the "fossil record" of their formation history.

Jiri Vanicek
Biology · Institute for Advanced Study

Jiri Vanicek's work includes the development of numerically efficient theoretical methods to describe quantum effects experimentally observed in enzymatic reactions. At the Institute, he has used statistical algorithms to predict genes regulated by herpesviral microRNAs, leading to a theoretical model of the mechanism of latency in herpesviruses. Together with Todd Riley, he has also extended methods to search for new signals encoded in the human genome.

Alexei Vazquez
Biology · Institute for Advanced Study

At the Institute, Alexei Vazquez will continue to work on developing statistical frameworks to analyze large biological datasets, understanding the organization of biological systems, and will begin studying the metabolism of cancer cells.

SCHOOL OF NATURAL SCIENCES

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

Members, Visitors, and Research Staff

Tomer Volansky

Particle Physics · The Weizmann Institute of Science

Tomer Volansky's research interests span topics in particle cosmology, phenomenology of high-energy physics, and some aspects of string theory. He is mainly interested in the interface between these subjects. In the next year, he hopes to continue his study of the LHC phenomenology and various aspects of supersymmetry and supersymmetry breaking.

Johannes Walcher

Mathematical and Particle Physics · Institute for Advanced Study · *m*
Roger Dashen Membership

Johannes Walcher is working on a range of topics in string theory. He is mostly interested in mathematical and phenomenological aspects of string compactifications with D-branes, orientifolds, and fluxes, as well as possible implications for cosmology.
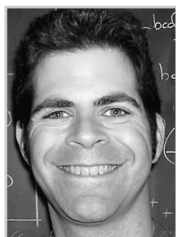
Brian Wecht

Particle Physics · Massachusetts Institute of Technology
Frank and Peggy Taplin Membership

Brian Wecht is interested in working on string theory and supersymmetric gauge theories. In particular, Brian plans to continue studying novel string compactifications, as well as pursuing some (possibly) phenomenological aspects of supersymmetry.

John Wikswo

Biology · Vanderbilt University · *f*

John Wikswo uses novel instrumentation, quantitative measurements, and mathematical models to study the electrodynamics of isolated rabbit hearts and the metabolism and signaling of individual mammalian cells. At the Institute, he is exploring the problem of metabolic model inference using symbolic regression and closed-loop control of instrumented biological microelectromechanical systems (BioMEMS).

Chen-Hsiang Yeang

Biology · Institute for Advanced Study

During his stay at the Institute, Chen-Hsiang Yeang plans to study the combinatorial patterns of gene mutations in cancer tissues, and relate this information to signal transduction and gene regulatory networks.

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

Members, Visitors, and Research Staff

Nadia Zakamska
Astrophysics · Institute for Advanced Study

Nadia Zakamska is studying processes near compact objects, such as neutron stars and black holes. In particular, she is investigating the structure and origin of relativistic outflows using theoretical and observational methods. She will also pursue her interests in dynamics of stellar and planetary systems.
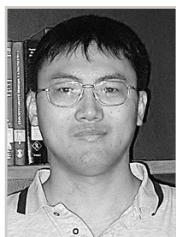
Zheng Zheng
Astrophysics · Institute for Advanced Study

At the Institute, Zheng Zheng will study the large-scale structure of the universe probed by the distribution of galaxies and use it to learn about galaxy formation and evolution. He is also interested in many other fields of astrophysics, such as radiative transfer of Lyman-alpha photons and its applications.

S C H O O L   O F   N A T U R A L   S C I E N C E S

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

School of Social Science

Administrative Officer: Donne Petito

Founded in 1973, the School of Social Science at the Institute for Advanced Study takes as its mission the analysis of societies and social change, and 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; and about the explanatory power of rational choice in the analysis of political decisionmaking and economic exchange. 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 of the 2007–08 academic year is "The Rule of Law Under Pressure." The pressure comes from the "war on terrorism" (and other wars) and from the claim that military and political emergencies require the expansion of executive power and the violation of conventional moral norms. We are interested in all these issues as they arise, and as they have arisen, in political life: dirty hands, Machiavellian princes, emergency powers, the debate about torture, and so on. But we are also interested in the opposite of all these: constitutionalism, limited government, judicial review, and civil liberties. How does the rule of law work to protect ordinary citizens? What is the role of judges and courts in maintaining the rule of law? When do the "needs of the hour" override constitutional limits? What does "necessity" mean in politics and war, and who decides when it comes into play?

Faculty

Danielle Allen
UPS Foundation Professor

Danielle Allen is a political theorist who has published widely 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, nondomination 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. This year she continues work on the concept of equality and on assessing whether concepts of "paradigm shift" can be useful for analyzing political change.

Eric S. Maskin
Albert O. Hirschman Professor

Eric Maskin's work in economic theory has had a deep influence on many areas of economics, political science, and law. This year he will continue his work on mechanism design, repeated games, income inequality, and the theory of voting.

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.

Faculty
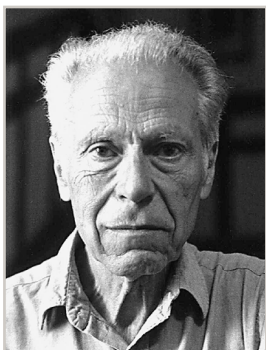
Albert O. Hirschman
Professor Emeritus

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.
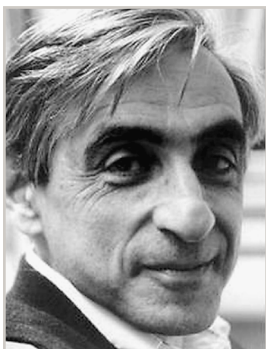
Michael Walzer
Professor Emeritus

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, Visitors, and Research Staff

Lakhdar Brahimi

Political Science · Institute for Advanced Study · *dv*

Lakhdar Brahimi, former Special Advisor to the Secretary-General of the United Nations, is working on a book with Salman Ahmed, who has worked closely with Brahimi in several UN Peace Operations, that will look at conflict and postconflict problems in a post-9/11 world, and reflect more broadly on the shape and direction of international relations in the years to come, both inside and outside of the UN.

Benjamin Brower

History · Texas A&M University
National Endowment for the Humanities Fellow

Benjamin Brower is examining the Muslim pilgrimage to Mecca and the Holy Places *(Hajj)* during the colonial period when French officials introduced new rules regulating the travel of Muslim pilgrims from the Mediterranean countries, becoming a source of negative inspiration marking the boundary between the "tolerant" values of metropolitan France and an "archaic" religiosity represented by France's Muslim subjects.

Edmund (Terry) Burke III

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

Edmund (Terry) Burke is researching France and the sociology of Islam from 1798 to 1962: particularly how the creation of the French colonial archive on Islam resulted in the development of French modernity itself, albeit from an unfamiliar angle; and how the complex legacy of French ethnographic study of Islam continues to haunt contemporary representations of Islam and the Maghrib.

Mary L. Dudziak

Law · University of Southern California Law School
Ginny and Robert Loughlin Member

Mary Dudziak is reexamining the history of twentieth-century America as a war story, in particular how war and preparation for war persistently shaped the nature of American democracy, the powers of government, the rights of citizens, and the nation's place in the world.

Leonard C. Feldman

Political Science · University of Oregon

Leonard Feldman's research concerns the examination of early modern and late-modern political thought, particularly the concept of necessity and the specific contexts within which necessity claims emerge, the set of relations, institutions, and identities that render a necessity claim intelligible, and the kinds of political practices necessity enables.

f First Term · *s* Second Term · *dv* Director's Visitor
v Visitor · *a* Research Assistant

Members, Visitors, and Research Staff

Ariel Furstenberg

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

Ariel Furstenberg is looking at Jewish intellectual reactions to historical events, as well as other conceptions of political phenomena such as war and peace, for a multivolume project being published by Yale University Press and chaired by Professor Michael Walzer that focuses on the history of Jewish political thought from the ancient period to modern times.

Piero Gottardi

Economics · University of Venice · *v*

Piero Gottardi is analyzing the properties of markets and contractual arrangements in economies where information is asymmetric. He is studying the conditions under which markets for information will emerge and what are their properties. He is also investigating the tradeoff between flexible and rigid contracts and the role that the presence of unforeseen contingencies may have in such choices.

Jonathan Hyslop

History · University of the Witwatersrand
Association of Members of the Institute for Advanced Study (AMIAS) Membership

Jonathan Hyslop is examining the political uses of rule of law in South Africa between the 1870s and 1914, particularly how contestations over the rule of law played themselves out in politics, popular culture, and literary production and to what extent they operated in an Empire-wide context rather than a regional one.

G. John Ikenberry

Political Science · Princeton University
National Endowment for the Humanities Fellow

G. John Ikenberry is studying the crisis of rule-based order in the contemporary American-dominated global system, particularly the implications of the United States' lessening commitment to supporting and operating within a system of mutually agreed upon rules and institutions and how the U.S. has become more of a rulebreaker than a rulemaker in the international community.

Michael M. Karayanni

Law · Hebrew University of Jerusalem
Funding provided by the Friends of the Institute for Advanced Study

Michael Karayanni is looking at religious communities and multiculturalism in the Middle East, in particular the implications of the judicial autonomy granted to religious groups in a number of Middle East countries. His study will focus on the Palestinian–Arab minority in Israel and make comparative analysis with the religious accommodations in other Middle Eastern countries.

f First Term · *s* Second Term · *dv* Director's Visitor
v Visitor · *a* Research Assistant

Members, Visitors, and Research Staff

Navin Kartik

Economics · University of California, San Diego
The Roger W. Ferguson, Jr. and Annette L. Nazareth Membership

Navin Kartik is working on applied game theory and political economy. His main project will study why decisionmakers solicit advice from experts with different opinions. He is also developing a dynamic model of "character" in political competition, with a focus on "flip-flopping," and working on information-based momentum in elections with sequential voting.

R. Daniel Kelemen

Political Science · Rutgers, The State University of New Jersey

R. Daniel Kelemen is researching the spread of American legal and regulatory style across Europe, assessing the degree to which a shift toward American legal style is occurring in the European Union and exploring the link between this shift and the process of European integration.

Ellen Kennedy

Political Science · University of Pennsylvania
Rosanna and Charles Jaffin Member

Ellen Kennedy is focusing on the economic sources of enlarged prerogative and sovereign discretion in twentieth-century Germany and on the development of international monetary constitutions after Bretton Woods. Each is an arena of debate and political theory increasingly relevant to the important question of whether, and how, the economy can be governed through the rule of law.

Alan B. Krueger

Economics · Princeton University
Leon Levy Foundation Member

Alan Krueger's research concerns estimating the value of attending an elite college; subjective well-being and time allocation; improving measures of economic and labor market performance; and developing methods to measure the extent of occupational licensing in the U.S. labor market and analyzing its effects on earnings and worker performance.

Lisa J. Laplante

Law · Praxis Institute for Social Justice

Lisa Laplante's study will follow the chronology of Peru's war against terrorism, using both legal and social lenses to analyze issues related to the delicate and difficult task of balancing individual rights with national security.

f First Term · *s* Second Term · *dv* Director's Visitor
v Visitor · *a* Research Assistant

Members, Visitors, and Research Staff

Patrick Macklem

Law · University of Toronto
Louise and John Steffens Member

Patrick Macklem's research concerns how international law is reorienting itself to address the challenges posed by new forms of military and political emergency, requiring a more robust conception of the rule of law in relation to the exercise of sovereign power in the international legal order. In particular, he will focus on humanitarian intervention and how its legality and legitimacy are intertwined.

Daijiro Okada

Economics · Rutgers, The State University of New Jersey
Richard B. Fisher Membership

Daijiro Okada is developing models of large-scale (self-enforced) social cooperation and applying the models to explain emergence, or breakdown thereof, of large-scale, uniquely human enterprises such as markets and law (including social norms). The models' predictions will be compared to empirical evidence from areas as diverse as economics, anthropology, history, and biology.

Bruno Perreau

Political Science · Sciences Po
Florence Gould Foundation Membership

Bruno Perreau is researching homosexuality and the rule of law in contemporary France, particularly how the regulation of homosexuality plays an active part in the legitimization of the political order, both in ordinary and exceptional circumstances, such as during war or in a postwar period.

Ralf Poscher

Law · Ruhr-Universität

Ralf Poscher is exploring how the state of exception can be described in relation to the legal system with an aim to establishing a guideline for jurisprudential, doctrinal, and public discussions on extraordinary legal powers in the defense against terrorism and other hazards that are likely to persist or recur in the years to come.

Nancy Ries

Anthropology · Colgate University
National Endowment for the Humanities Fellow

Nancy Ries is looking at public cynicism and everyday experience, particularly the multiple ways in which the Russian state is dynamically given form out of discourses and activities labeled—even by those who speak and employ them—as cynical or corrupt.

f First Term · *s* Second Term · *dv* Director's Visitor
v Visitor · *a* Research Assistant

Members, Visitors, and Research Staff

Ian Roxborough

Sociology · State University of New York, Stony Brook · *v*

Ian Roxborough is researching how U.S. strategic thinkers have con-
ceptualized operations in developing countries. He will build on
recent work on Cold War intellectual history by analyzing debates
within the U.S. military about threats emanating from the global
periphery (rogues, weak states, Islam, "chaos," ethnic conflict, "evil-
doers," etc.) and appropriate U.S. responses.

Hilary Silver

Sociology · Brown University

Through her research, Hilary Silver aims to acquaint Americans with
social exclusion, a sociological perspective and an empirical literature
influential in Europe and beyond, recognized as a social problem of
increasing multidimensional disadvantage that ruptures the social bond
of solidarity and impedes full participation in normatively proscribed
social activities.

Brian Z. Tamanaha

Law · St. John's University School of Law

Brian Tamanaha is attempting to overcome the realist–formalist
antithesis that dominates views of judging within the American legal
culture. In the pursuit of this project, his research will compare and
contrast claims about judging made by judges, social scientists, and
legal theorists.

Olivier Tercieux

Economics · CNRS-École Normale Supérieure
Deutsche Bank Membership

Olivier Tercieux aims to contribute to recent literature that
characterizes robust predictions in noncooperative games, that is, pre-
dictions of a given game that are not (too) sensitive to slight departures
from the assumption that this game is common knowledge.

Sari Wastell

Anthropology · Goldsmiths College, University of London

Sari Wastell is exploring the tensions and challenges involved in the
closure of the International Criminal Tribunal for the former
Yugoslavia in 2010 and the full transfer of prosecutorial responsibility
to the national jurisdictions based in Sarajevo, Zagreb, Belgrade, and
Pristina with the aim of offering some provisional suggestions for a
different model of transitional justice.

SCHOOL OF SOCIAL SCIENCE

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 U.S., and elsewhere.

Visitors

Yoshiyuki Inoue

Astrophysics · Kyoto University

Yoshi Inoue has worked on the extragalactic gamma ray background, and his interests span cosmology, gamma ray bursts, magnetohydrodynamic, black hole physics, and related topics.

Andrew McGowan

Theoretical Physics · College of William and Mary

During Andrew McGowan's stay at the Institute he will be exploring questions of epistemology and ontology and their relationship to scientific inquiry. He will also investigate the relevance of these questions to human concerns such as values and ethics.

Visitors

Jan-Markus Schwindt

Theoretical Physics · University of Heidelberg

Jan-Markus Schwindt's work in physics so far addresses issues in cosmology, extra dimensions, and quantum gravity. During his visit at the Institute, he will work on interdisciplinary projects concerning the philosophy of science and the mind/matter problem in collaboration with Professor Piet Hut.
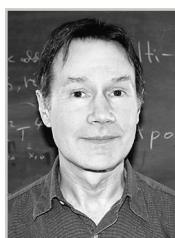
Steven Tainer

Asian Philosophy · Institute for World Religions

Steven Tainer is on the faculty of the Institute for World Religions in Berkeley, teaching Asian Studies. At the Institute, he will work on possible applications of traditional Asian notions of epistemology and ontology to both Western ethics and modern science, particularly new areas in cognitive science.

Ed Turner

Astrophysics · Princeton University

Ed Turner's primary research activities concern exoplanets, astrobiology, cosmology, gravitational lenses, quasars and statistical problems in astrophysics. At the Institute, he will work on these topics, particularly the latter one, as well as exploring issues related to the history, philosophy and nature of both science and other approaches to acquiring knowledge.

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.

In 2007, a new Artist-in-Residence joins the Institute: Pulitzer Prize-winning composer Paul Moravec. His inaugural season, "Tradition Redefined," will continue to explore the wide variety of aesthetic perspectives in art music, especially of the twentieth and twenty-first centuries.
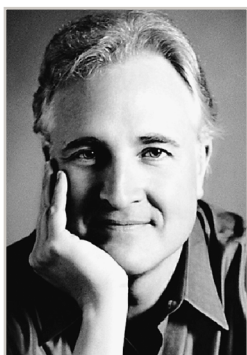
Paul Moravec
Composer

The recipient of the 2004 Pulitzer Prize in Music, Moravec has composed more than ninety orchestral, chamber, choral, lyric, film, and electro-acoustic compositions. In addition to directing the IAS concert series, he will be composing an opera for Santa Fe Opera as well as a new piece for the Orpheus Chamber Orchestra.

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 upon the nature of their work.

Lakhdar Brahimi

Former Special Advisor to the Secretary-General of the United Nations

Lakhdar Brahimi is working on a book with Salman Ahmed, who has worked closely with Brahimi in several UN Peace Operations, that will look at conflict and post-conflict problems in a post-9/11 world, and reflect more broadly on the shape and direction of international relations in the years to come, both inside and outside of the UN.
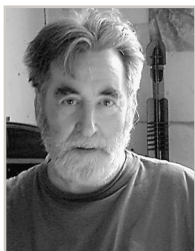
Tom Phillips

Painter, writer, composer

Tom Phillips would like to be conducting proton collider experiments but in fact will be continuing work on his now forty-year-old project A HUMUMENT, and pursuing his current collaboration (with Tarik O'Regan) on the opera *Heart of Darkness*, and having lunch and once again looking at trees in the fall.

Siobhan Roberts

Writer, journalist

Siobhan Roberts—author of *King of Infinite Space: Donald Coxeter, The Man Who Saved Geometry,* and a journalist who has contributed to the *The New York Times, The Boston Globe,* and *Seed,* among other publications—plans to investigate the role of analogy in scientific research and discovery, explore the field of molecular biology, and generally chase her curiosity.

Claudine Serre

French diplomat, author, historian

French diplomat and historian Claudine Serre is a specialist involved in women's rights and a writer under the pen name of Claudine Monteil. Author of five books on Sartre, Beauvoir, and Chaplin, including *The Beauvoir Sisters*, she will conduct research in the archives of the Institute for books in preparation.

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