IAS

Institute for Advanced Study

Faculty and Members 2012–2013

Contents

Information contained herein is current as of September 24, 2012.

Mission and History

The Institute for Advanced Study is one of the world's leading centers for theoretical research and intellectual inquiry. The Institute exists to encourage and support fundamental research in the sciences and humanities—the original, often speculative thinking that produces advances in knowledge that change the way we understand the world. It provides for the mentoring of scholars by Faculty, and it offers all who work there the freedom to undertake research that will make significant contributions in any of the broad range of fields in the sciences and humanities studied at the Institute.

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

Abraham Flexner was succeeded as Director in 1939 by Frank Aydelotte, followed by J. Robert Oppenheimer (1947), Carl Kaysen (1966), Harry Woolf (1976), Marvin L. Goldberger (1987), Phillip A. Griffiths (1991), and Peter Goddard (2004). In July 2012, Robbert Dijkgraaf became the Institute's ninth Director.

Dedicated to the disinterested pursuit of knowledge, the Institute has had permanent impact, in both intellectual and practical terms, through the work of its Faculty and Members. One of the Institute's unique strengths is its permanent Faculty, whose broad interests and extensive ties to the larger academic world are reflected in their own work and also in the guidance and direction they provide. The Faculty, numbering no more than twenty-eight, selects and works closely with visiting Members and defines the major themes and questions that become the focus of each School's seminars and other activities. Organized in four Schools (Historical Studies, Mathematics, Natural Sciences, and Social Science), the Faculty and Members interact with one another without any departmental or disciplinary barriers. Each year the Institute awards fellowships

to some 190 visiting Members from about one hundred universities and research institutions throughout the world. The Institute's more than six thousand former Members hold positions of intellectual and scientific leadership in the United States and abroad. Thirty-three Nobel Laureates and thirty-eight out of fifty-two Fields Medalists, as well as many winners of the Wolf and MacArthur prizes, have been affiliated with the Institute.

Located in Princeton, New Jersey, the Institute is a private, independent academic institution with no formal links to other educational institutions. However, there is a great deal of intellectual, cultural, and social interaction with other nearby institutions. The Institute's Historical Studies–Social Science Library has a collection of some 125,000 volumes and subscribes to more than 1,000 journals. The Mathematics–Natural Sciences Library contains about 30,000 volumes and an important collection of journals. Institute scholars have full access to the libraries of Princeton University and the Princeton Theological Seminary.

The Institute is situated on eight hundred acres of land, the majority of which is conserved permanently, forming a key link in a network of green spaces in central New Jersey and providing a tranquil environment for Institute scholars and members of the community. The Institute does not receive income from tuition or fees. Resources for operations come from endowment income, grants from private foundations and government agencies, and gifts from corporations and individuals.

Robbert Dijkgraaf

Director and Leon Levy Professor

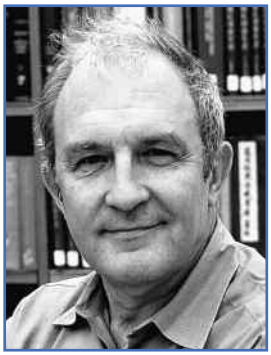
Robbert Dijkgraaf is a leading mathematical physicist who has made significant contributions to string theory and the advancement of science education. He has identified deep connections between particle physics and mathematics, as well as between different areas of mathematical physics. His work has influenced understanding of string theory in low dimensions, topological strings, the dynamics of supersymmetric gauge theories, and the quantum states of black holes. A distinguished public policy adviser and passionate advocate for science and the arts, Dijkgraaf previously served as President of the Royal Netherlands Academy of Arts and Sciences (2008–12) and has been Co-Chair of the InterAcademy Council since 2009.

School of Historical Studies

Administrative Officer: Marian Gallagher Zelazny

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

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



Yve-Alain Bois

Professor · Art History

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

Angelos Chaniotis

Professor · Ancient History and Classics

Angelos Chaniotis is engaged in wide-ranging research in the social, cultural, religious, legal, and economic history of the Hellenistic world and the Roman East. The author of many books and articles and senior editor of the *Supplementum Epigraphicum Graecum*, he has worked on war, religion, communicative aspects of rituals, and strategies of persuasion in the ancient world. His current research focuses on emotions, memory, and identity. He is interested in previously unexplored aspects of the ancient world in a dialogue with other disciplines.

Patricia Crone

Andrew W. Mellon Professor · Islamic History

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

Nicola Di Cosmo

Luce Foundation Professor in East Asian Studies · East Asian Studies

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

Patrick J. Geary

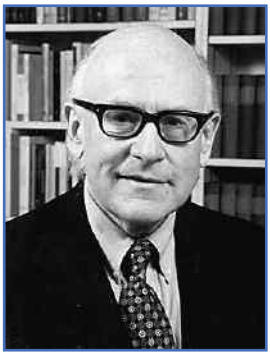
Professor · Medieval History

Patrick Geary's work extends over a vast range of topics in medieval history, both chronologically and conceptually—from religiosity to language, ethnicity, social structure, and political organization. Many of his essays and books remain standard literature in the field and have been translated in multiple languages. Currently, Geary is leading a major project that studies the migration of European societies north and south of the Alps through the analysis of ancient DNA in Longobard cemeteries in Hungary and in Italy. He also directs the St. Gall Plan Project, an Internet-based initiative funded by the Andrew W. Mellon Foundation that provides tools for the study of Carolingian monasticism.

Jonathan Israel

Professor · Modern European History

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



Glen W. Bowersock

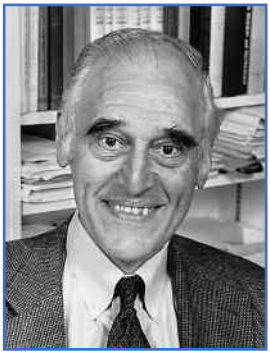
Professor Emeritus · Ancient History

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

Caroline Walker Bynum

Professor Emerita · European Medieval History

Caroline Bynum studies the social, cultural, and intellectual history of Europe from the early Middle Ages to the early modern period. Her books have explored women's religious movements, the history of the body, the role of sacrifice in religion, and the materiality of late medieval art and devotion. She is currently working on a comparison of Western and non-Western pieties.



Giles Constable

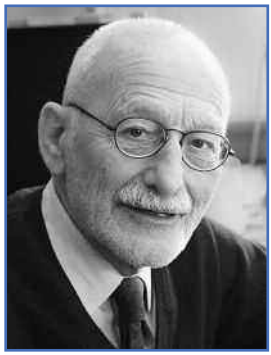
Professor Emeritus · Medieval History

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

Christian Habicht

Professor Emeritus · Ancient History

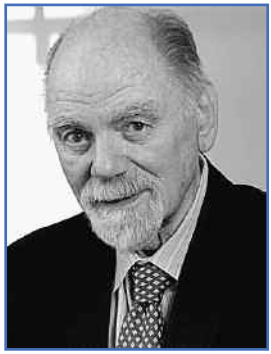
Christian Habicht is among the leading historians of the Hellenistic period. He is an authority on Greek epigraphy and on the history of Athens between Alexander the Great and Augustus. He has published books on the Hellenistic ruler-cults, on the Maccabees, on Cicero, and on Pausanias. He has edited hundreds of previously unpublished inscriptions from important sites in Greece and Asia Minor. To a new bilingual edition of Polybius, he contributed the introduction and explanatory notes; the first five of six volumes were published in 2010–12.



Irving Lavin

Professor Emeritus · Art History

Irving Lavin is one of America's most distinguished art historians. He has written extensively on the history of art from late antiquity to modern times, including numerous studies on Italian painting, sculpture, and architecture of the Renaissance and Baroque periods. His interests have focused primarily on the correlation between form and meaning in the visual arts. Two volumes of his collected works appeared under the title *Visible Spirit* (2007–09). A third volume is in press, "Bernini at St. Peter's: The Pilgrimage," as is an essay, "Divine Grace and the Remedy of the Imperfect: Michelangelo's Signature on the St. Peter's Pietà."



Peter Paret

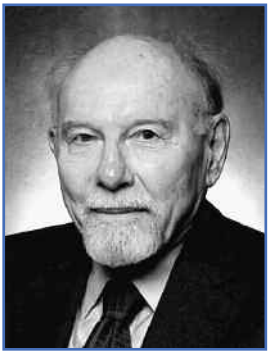
Professor Emeritus · Modern European History

Peter Paret is a cultural and intellectual historian with particular interest in the interaction of war and society since the eighteenth century, how historians integrate war with their interpretation of other historical forces, and the relationship between tradition and modernism in the art of nineteenth and twentieth-century Europe. His most recent book (2012), written with Helga Thieme, *Myth and Modernity: Ernst Barlach's Drawings on the Nibelungen*, discusses a modern interpretation of a medieval myth as a document of German history in the 1920s and 30s.

Heinrich von Staden

Professor Emeritus · Classics and History of Science

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



Morton White

Professor Emeritus · Philosophy and Intellectual History

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

Nathanael Andrade

Roman Imperial Near East · University of Oregon
The Andrew W. Mellon Foundation Fellowships for Assistant Professors

Nathanael Andrade's current research explores how the location of Roman imperial Syria on commercial networks between the Mediterranean and Indian ocean worlds enhanced the prestige value of local or regional forms of language and culture and helped facilitate the dissemination of Syriac as a mainstream Syrian language in late antiquity.

George Boys-Stones

Ancient Philosophy · Durham University · *s*

George Boys-Stones is working on a new study of so-called "Middle" Platonism (ca. 50 B.C.–A.D. 250). The aim is to make the case for the philosophical sophistication of this seminal movement, not least by tracing its polemical interactions with the Hellenistic schools and with Christian philosophy.

Alessandro Maria Bruni

Byzantium and Eastern Christianity · Institute for Advanced Study · *f*
Edward T. Cone Member in Music Studies

Alessandro M. Bruni is working on the edition of an Old Georgian codex from Mount Athos (X century), which contains liturgical hymns with musical notation. In his work, he adopts a comprehensive historical-philological method of inquiry, based on interdisciplinary, comparative, and typological research.

Christer Bruun

Roman History · University of Toronto · *f*
The Gladys Krieble Delmas Foundation Member

Christer Bruun's research concerns the civic identity of Ostia, Rome's harbor. He will study cultural and political trends in the town, the largest in ancient Italy after Rome, with the aim to analyze how trade, immigration, and the influx of ideas and religions impacted the inhabitants.

Mayke de Jong

Medieval History · Utrecht University · *f*
Funding provided by the Herodotus Fund

Mayke de Jong's project is about political thought, rhetoric, and action in the decades after the rebellions against Louis the Pious in the 830s. Her focus is on the "Epitaphium Arsenii," a major polemical narrative that has been a mainstay for modern historiography about "the decline of the Carolingians."

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

André Dombrowski

History of Art, Nineteenth-Century Europe · University of Pennsylvania
Funding provided by the Herodotus Fund

André Dombrowski's research centers on French art in the late nineteenth century, with an emphasis on the histories of science, politics, and psychology. He currently studies the intersections between Impressionism and modern technologies of time-keeping, such as the role played by the advent of universal time in 1884 within the serried order of Seurat's pointillist technique.

Mark William Driscoll

East Asian Intellectual and Political History · University of North Carolina
Elizabeth and J. Richardson Dilworth Fellow; additional funding provided by The Andrew W. Mellon Foundation

Mark Driscoll's research contests the standard historiography that Japan (from 1868) and China (from 1895) obediently adopted the templates of Western modernization. He argues that the historical experience of Japan and China shares much with recent calls for jihad/struggle against the West.

Marco Fantuzzi

Classicism, Greek Literature · Università degli Studi di Macerata · *f*
Funding provided by The Andrew W. Mellon Foundation

Marco Fantuzzi is studying the "Rhesus," a tragedy that the manuscripts ascribe to Euripides. Rather than provide yet another attempt at confirming or rejecting this alleged authorship, he is investigating how its style and content place it in the literary and historical milieu between the end of the fifth and the first half of the fourth centuries B.C.E.

Ingrid Maren Furniss

Chinese Art and Archaeology, Musicology · Lafayette College · *s*
Edward T. Cone Member in Music Studies; additional funding provided by the Hetty Goldman Membership Fund

Ingrid Furniss is studying the impact of Silk Road trade on one major aspect of premodern Chinese society and culture: its music. She will argue that the lute, a musical instrument likely originating in the Near East or Central Asia, was a highly charged object replete with associations of ethnic and political identity, emotion, and gender in China.

Alex Gottesman

Classics · Temple University · *s*
Funding provided by the Herodotus Fund

Alex Gottesman is examining extrainstitutional forms of Athenian democratic politics. He suggests that by studying noninstitutional forms of political action (such as festivals, rituals, and various "publicity stunts") and considering how they could be used to affect public opinion, we can trace the outlines of a broader and more inclusive public sphere.

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

Jeffrey Lawrence Gould
Latin American History · Indiana University
George Kennan Member

Jeffrey Gould is exploring the problematic relations between the Latin American left and its grassroots bases. In particular, he is focusing on minor utopian experiments promoted by peasants and workers in El Salvador during the 1970s and the ways in which the left leadership reacted to those movements.

Yannis Hamilakis
Greek Archaeology, Classical Reception · University of Southampton
Hetty Goldman Member

Yannis Hamilakis is examining the social biographies of primarily classical archaeological monuments, artifacts, and sites in Greece and the broader eastern Mediterranean, from the early modern period to the present. He is focusing on local, vernacular attitudes, discourses, and practices and their clash with and eventual transformation by national, modernist archaeology, and more recent globalized processes.

James A. Harris
Eighteenth-Century British Intellectual History · University of St Andrews
Hans Kohn Member; additional funding provided by the Elizabeth and J. Richardson Dilworth Fellowship Fund

James Harris is completing an intellectual biography of David Hume. In particular, he will be working on Hume's *History of England* and its historiographical and political contexts, and on the place of religion in Hume's intellectual career taken as a whole.

Charles Hartman
Chinese History · University at Albany, State University of New York · *s*
The Starr Foundation East Asian Studies Endowment Fund Member

Charles Hartman researches the historiography of the Chinese Song dynasty (960-1279). His present work explores the synergistic relationship between rhetorical appeals to precedent during debates on state economic policy and the creation of the dynasty's political history.

Helmut Heit
Philosophy · Technische Universität Berlin
Dilthey Fellowship funded by Volkswagen Stiftung

Helmut Heit is interested in the context, content, and currency of Nietzsche's philosophy of science. He is studying Nietzsche's relation to nineteenth-century developments in the sciences and his reception in the twentieth century. What (good) is science according to Nietzsche and what may he contribute to our ongoing dispute?

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

Yitzhak Hen

Early Medieval History · Ben-Gurion University of the Negev

Friends of the Institute for Advanced Study Member; additional funding provided by the Herodotus Fund

Yitzhak Hen is studying the nature and role of Arianism in the early medieval West. By looking at each of the post-Roman Barbarian kingdoms, with an emphasis on the place of Arianism within each, he is seeking to offer a new perspective on the function of Arianism in late antiquity and the early Middle Ages.

Yonglin Jiang

Chinese History · Bryn Mawr College

Frederick Burkhardt Fellowship funded by the American Council of Learned Societies

Yonglin Jiang's research interest focuses on legal culture in imperial China and ethnicity and law in contemporary China. At the Institute, he will explore how justice was constructed in local communities and how local adjudication and social change affected each other.

Mark Jurdjevic

Italian Renaissance · York University

Felix Gilbert Member; additional funding provided by the National Endowment for the Humanities

Mark Jurdjevic studies the political and intellectual history of the Italian Renaissance, focusing in particular on Machiavelli and the theory and practice of Florentine republicanism. He is currently studying Machiavelli's correspondence with Francesco Guicciardini and other Florentine intellectuals and politicians and its impact on Machiavelli's later political thought.

David Kennedy

Roman Archaeology · University of Western Australia · *v, f*

David Kennedy is studying Arabia Petraea, across which are the traces of several thousand "sites" from roads through villages to field systems. The published data is extensive and now complemented by extensive aerial survey, offering a rare opportunity to interpret and map, define and explain the dynamics of an extensive "Roman" landscape.

Jungwon Kim

Korean History · University of Illinois at Urbana-Champaign

The Andrew W. Mellon Foundation Fellowships for Assistant Professors

Jungwon Kim is examining socio-cultural-legal aspects of late Chosŏn Korea (1392–1910) by locating legal agencies of the state, local authorities, and clientele in the making of early modern Korean local courts. Her study utilizes legal archives as a lens through which to view the interactions between local courts and society.

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

Derek Krueger

Religion, Late Ancient and Byzantine Studies · The University of North Carolina at Greensboro

Funding provided by the National Endowment for the Humanities; additional funding provided by the Herodotus Fund

Derek Krueger is studying the representation of the self in Byzantine Christian ritual from the sixth to the ninth centuries. Hymns, architectural settings, devotional objects collected on pilgrimage, and the emerging cult of icons gave Christians the opportunity to enter the narratives of the Bible and become the subjects of liturgy.

Anna Krylova

Modern Russian History · Duke University · *s*

George Kennan Member

Anna Krylova specializes in intellectual, cultural, and social history of modern Russia. Her interests also include questions of historical interpretation and critical theory. Her new project turns the pivotal and seemingly obvious term of modern Russian history—the "Soviet"—into a historical problematic and rethinks the history of building socialism in the age of globalization.

Stephen D. Lambert

Ancient History, Greek Epigraphy · Cardiff University

Funding provided by the Patrons' Endowment Fund

Stephen Lambert plans to write a monograph on the city of Athens in one of the most eventful periods of its history, from the perspective of the city's inscribed laws and decrees. It represents the final phase of a project that has also involved preparation of a new corpus of these inscriptions.

Renée Levine Melammed

Medieval History, Jewish Studies · The Schechter Institute of Jewish Studies · *s*

Funding provided by The Andrew W. Mellon Foundation

Renée Levine Melammed's field of research is medieval Jewish history with an emphasis on social history and gender analysis of communities in Spain and Islamic countries. She will be working on a project focusing on women's lives in Mediterranean society on the basis of documents located in the Cairo Genizah (950–1250).

Munkh-Erdene Lhamsuren

Central Eurasian Studies · National University of Mongolia

George Kennan Member

Munkh-Erdene Lhamsuren is studying the interweaving effects of "scientific" knowledge and state power upon the construction of collective identity. In particular, he is examining how a Russo-Soviet ethnically framed vision of Mongolia and the Mongolian state's Soviet-imposed and -inspired nationality policy transformed modern Mongolia into a multiethnic polity.

Maria Hsiuya Loh

History of Art · University College London

Willis F. Doney Member; additional funding provided by the Herodotus Fund

Maria Loh is interested in ghost stories and in the pathos of portraiture. The focus of her research is the perfidious nature of portraits, the perishable body of the artist, and the multiple lives that rise from the ashes of the dead.

Carolyn Merchant

History of Science, Environmental History · University of California, Berkeley · *f*

Funding provided by The Andrew W. Mellon Foundation

Carolyn Merchant is examining thinkers from medieval times through the seventeenth century who grappled with the tensions between nature as an active, uncontrollable, creative force (*natura naturans*) as experienced in everyday life versus nature as created world (*natura naturata*) that could be rationally understood and controlled though the laws of nature.

Christian Meyer

East Asian Studies · Friedrich-Alexander-Universität Erlangen-Nürnberg

Gerda Henkel Stiftung Member; additional funding provided by the Herodotus Fund

Christian Meyer is studying how the traditional Chinese formula *shendao shejiao* (by "theistic ways" establishing the (moral) teachings) played an instrumental role in the processes of appropriating the new Western concept of "religion." The project analyzes its use as an illuminating example of the conceptual history of "religion" in modern China.

Jan-Werner Müller

Modern Intellectual History · Princeton University · *s*

Jan-Werner Müller is tracing three strategies for finding a place for Christianity—and Catholicism in particular—in the modern democratic order: the creation of a Christian demos, a demos constrained by Christian institutions, and Christian Democratic party politics. He aims to draw larger normative lessons from this history, especially for thinking about the relationship between Islam and democracy.

Hyun Ok Park

East Asian Studies · York University · *v, f*

Hyun Ok Park is completing an investigation of the ways that the task of rapprochement of the two Koreas has been changed to the formation of ethnic sovereignty in the post–Cold War era. It concerns a democratic politics that imagines the market as a mechanism of reparation, peace, and human rights.

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

Marcus M. Payk
Modern European History · Humboldt-Universität zu Berlin
Dilthey Fellowship funded by Volkswagen Stiftung

Marcus Payk is exploring the role of international law and international lawyers at the Paris Peace Conference of 1919–20. His work seeks to understand the procedures that define "politics" and "law" in modern international relations and how this contributed to the emergence of international legal regimes in Europe.

Roberta Pergher
European History, Fascism, Empire · Indiana University · *s*
Elizabeth and J. Richardson Dilworth Fellow

The Fascist regime dreamt of a *nazione impero*, a vision that sometimes implied a greater Italy populated only by Italians and at other times assumed a variety of peoples living under beneficent Roman rule. Roberta Pergher is exploring the character and contradictions of Italian expansionism, locating them in the dilemmas of imperial rule in the interwar period.

Anne-Lise Rey
Philosophy, History of Science · Université Lille 1
Funding provided by the Florence Gould Foundation Fund

Anne-Lise Rey is exploring how many thinkers of the first half of the eighteenth century, often from different perspectives, attempted to combine two incommensurable paradigms: Leibniz's natural philosophy, whose physics is based on metaphysics, and modern science, as embodied by Newton who "does not imagine hypotheses."

Juhyung Rhi
Art History · Seoul National University
Edwin C. and Elizabeth A. Whitehead Fellow; additional funding provided by the Herodotus Fund

Juhyung Rhi specializes in Buddhist art focusing on South Asia and Korea. He has worked primarily on the tradition of Gandhara and currently is working on a book that explores diverse aspects in the relationship between the Buddhist religion and its visual manifestations in the region.

Marijana Ricl
Ancient History, Greek Epigraphy · University of Belgrade
Martin L. and Sarah F. Leibowitz Member

Marijana Ricl is currently looking at available literary sources, inscriptions, coins, and material traces of known sacred places in her investigation of local sanctuaries as human communities, unities of persons and things, and not simply places of cult in the everyday life of several Anatolian regions (e.g., Mysia, Lydia, Phrygia) in the Hellenistic and Roman period.

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

Bruce Rusk

Cultural History of Early Modern China · The University of British Columbia · *f*

The Starr Foundation East Asian Studies Endowment Fund Member

Bruce Rusk is examining the creation and assessment of authenticity in China during the late Ming (1368–1644) and early Qing (1644–1911). He seeks to show how the ubiquitous concept of authenticity (*zhen*) was defined through its opposites, ubiquitous failures, and subversions.

Ortal-Paz Saar

Middle Eastern History, Judaic Studies · Tel Aviv University

AMIAS Member; additional funding provided by the Herodotus Fund

Ortal-Paz Saar researches Jewish cultural history with a focus on magic and rituals. She is developing a socioreligious textual typology of Babylonian incantation bowls. These intriguing ritual objects from late-antique Mesopotamia reflect the relations between the various religious groups who employed them.

Adam Sabra

Islamic Studies · University of California, Santa Barbara

Funding provided by the National Endowment for the Humanities; additional funding provided by the Herodotus Fund

Adam Sabra is studying an aristocratic family in Ottoman Egypt (ca. 1500–1800). Arguing that families can be considered historical actors, he will attempt to explain the success of one family in advancing and preserving its political, economic, and cultural status over a period of three centuries.

Ron Sela

History, Historiography of Islamic Central Asia · Indiana University · *f*

Funding provided by the Herodotus Fund

Ron Sela is examining the formation, development, and range of meanings of Turkic identity in Central Asia in the Islamic period based on expressions of self-representation in written sources from the region, authored in Chaghatay Turkic, Persian, Russian, and Arabic.

Mitra Sharafi

History of Law and Medicine in South Asia · University of Wisconsin–Madison · *f*

The Andrew W. Mellon Foundation Fellowships for Assistant Professors

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

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

Weirong Shen

History, Philology, Buddist Studies · Renmin University of China
The Starr Foundation East Asian Studies Endowment Fund Member

Weirong Shen, a philologist and Chinese historian of Tibetan Buddhism, is currently researching the history of Tibetan tantric Buddhism of central Eurasia from the eleventh to fifteenth centuries through textual criticism.

Evrydiki Sifnaiou

Economic and Social History · The National Hellenic Research Foundation · *f*
Elizabeth and J. Richardson Dilworth Fellow

Evrydiki Sifnaiou is investigating the social and economic networks of the eastern Mediterranean. She is focusing on Odessa, a "peripatetic" approach to a nineteenth-century port-city, and how its multiethnic social groups "shared," competed, clashed, and cooperated by presenting common or distinctive experiences in the city's space.

Nigel Scott Smith

Comparative Literature and History · Princeton University

Nigel Smith is writing about the relationship between state structure and performance and literary production in early modern Europe, with a comparative focus on cases in England, the Dutch Republic, France, Spain, and German and Italian states. He will explore the articulation of ideas of freedom in poetry and drama written in the region in the period 1500 to 1700.

Jörg Sonntag

Medieval History · Technische Universität Dresden · *f*
George William Cottrell, Jr. Member; additional funding provided by the Herodotus Fund

Jörg Sonntag is examining the cultural potential in medieval monasticism for the innovation, reception, and transmission of games and play as well as their ethical, political, and theological meanings and messages within society.

Nicola Terrenato

Roman Art and Archaeology · University of Michigan · *s*
William D. Loughlin Member; additional funding provided by the Hetty Goldman Membership Fund

Nicola Terrenato studies the early phases of Rome's expansion (fourth–third centuries B.C.E.) through archaeological and textual sources. He thinks that a different model of imperialism can be proposed by focusing on elite negotiation and non-Roman agency.

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

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

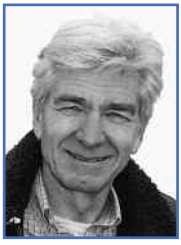
Stephen Tracy is helping English and Australian colleagues prepare a new edition of Athenian decrees of the late fourth to third centuries B.C. He is also working on Athenian lettercutting of the second half of the fifth century B.C. and on the hands of the so-called Athenian Tribute Lists.

Francesca Trivellato
Early Modern European History · Yale University · *f*
Hans Kohn Member

Francesca Trivellato is studying the persistence and transformation of Christian ideas about Jewish usury to understand changing attitudes toward credit in seventeenth- and eighteenth-century Europe. She will also examine how nineteenth-century views of medieval Jews shaped grand narratives about the rise of Western capitalism when economic history emerged as an academic discipline.

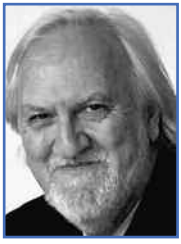
Frans van Liere
Medieval History · Calvin College
Agnes Gund and Daniel Shapiro Member

Frans van Liere is exploring how medieval Christians' encounter with Jewish scripture shows that medieval Christians came to acknowledge that Jewish textual traditions were neither written in stone nor frozen in time, an acknowledgement that deeply influenced their attitudes toward Jews in this period.



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

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



Anthony Vidler
Architecture and Urban Studies · The Cooper Union for the Advancement of Science and Art · *s*

Anthony Vidler is completing a history of architecture from 1945 to the present, commissioned by the Oxford History of Art, in its intellectual, social, and political contexts with an emphasis on the role of architecture in urban development, from postwar reconstruction to the mega-cities of global expansion.

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

Adelheid Voskuhl

History of Technology · Harvard University · *s*
Funding provided by the Herodotus Fund

Heidi Voskuhl is studying how engineers first drew up "philosophies of technology" in the period of high industrialism in Germany and the United States and examining how questions about the "consequences" of technology in society and engineers' "social responsibilities" became matters of systematic public and semi-public debates of contemporary metaphysics, political theory, and ethics.

Aihe Wang

Chinese Studies · The University of Hong Kong · *s*
Willis F. Doney Member; additional funding provided by The Andrew W. Mellon Foundation

Aihe Wang is researching the underground art communities during China's Cultural Revolution. Centered on the Wuming painters and other cultural groups active in the 1970s, she is exploring how their everyday practice generated alternative communities, and how human creativity engendered visions and forces for social transformation.

Ittai Weinryb

History of Art · Bard Graduate Center
The Andrew W. Mellon Foundation Fellowships for Assistant Professors

Ittai Weinryb is studying the art and material culture of the long twelfth century. By focusing on a complex and highly creative moment of technological development, he will examine the reemergence and spread of metal-casting techniques in medieval Europe.

Frédérique Woerther

Islamic Philosophy · Centre National de la Recherche Scientifique
Willis F. Doney Member

Frédérique Woerther works on Aristotle and the Aristotelian tradition in antiquity and in medieval Islamic philosophy. She is currently working on the Latin translation of Averroes's "Middle Commentary on the Nicomachean Ethics."

Chen-Pang Yeang

History of Science and Technology · University of Toronto
Funding provided by the Herodotus Fund

Chen-Pang Yeang works on the history of physics and technology in twentieth-century Western Europe and North America. At the Institute, he plans to explore a broad history of noise in sound technology, statistical physics, mathematics of probability, and telecommunications engineering from the late nineteenth to the mid-twentieth centuries.

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

School of Mathematics

Administrative Officer: Mary Jane Hayes

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

During the 2012–13 academic year, the School's special program will focus on univalent foundations of mathematics. The program activities will be organized by Steve Awodey of Carnegie Mellon University, Thierry Coquand of the University of Gothenburg, and Vladimir Voevodsky of the Institute. The main goal of the program will be to make available to a wider mathematical audience the recent advances that may finally make it practical for pure mathematicians to use "proof assistants" in their work.

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.

Jean Bourgain

IBM von Neumann Professor

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

Helmut Hofer

Professor

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

Robert MacPherson

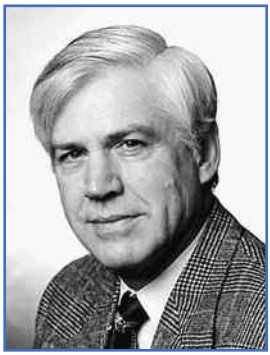
Hermann Weyl Professor

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

Peter Sarnak

Professor

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



Thomas Spencer

Professor

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

Richard Taylor

Professor

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

Vladimir Voevodsky

Professor

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

Avi Wigderson

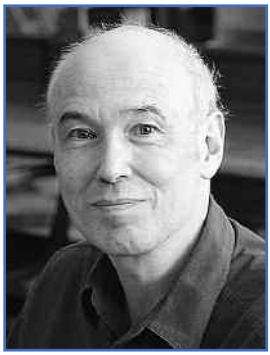
Herbert H. Maass Professor

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

Enrico Bombieri

Professor Emeritus

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



Pierre Deligne

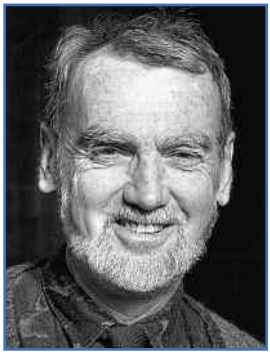
Professor Emeritus

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

Phillip A. Griffiths

Professor Emeritus

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



Robert P. Langlands

Professor Emeritus

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

Peter Aczel

Mathematical Logic · The University of Manchester · *f*

Peter Aczel has worked in mathematical logic, motivated by an interest in the foundations of mathematics. Among other topics, he is interested in constructive set theory, a topic founded on dependent type theory. He plans to contribute to the development of type theory as a univalent foundation.

Benedikt Ahrens

Semantics of Programming Languages · Institute for Advanced Study

Funding provided by the National Science Foundation

Benedikt Ahrens is interested in the logic, syntax, and semantics of programming languages, and the formalization of mathematics. During his time at the Institute, he will participate in the development of univalent foundations.

Peter Albers

Symplectic Geometry · Westfälische Wilhelms-Universität Münster · *v*

Peter Albers is working on symplectic geometry and Hamiltonian dynamical systems. During his visit at the IAS, he will mostly focus on working on the polyfold theory developed by Hofer, Wysocki, and Zehnder.

Thorsten Altenkirch

Computer Science, Univalent Foundations · University of Nottingham · *s*

Thorsten Altenkirch researches type theory as a foundation of formal reasoning and its application to computer science, particularly category theory and constructive logic. He has formulated an extensional intensional type theory (LICS99,PLPv08), also called observational type theory, which he would like to extend to a proof-relevant setting and also capture Voevodsky's univalence axiom.

Nalini Anantharaman

Mathematics · Université Paris-Sud 11 · *vnf, s*

Funding provided by the National Science Foundation; additional funding provided by the Fernholz Foundation

Nalini Anantharaman's research explores the applications of the theory of dynamical systems to the spectral theory of Schrödinger operators. She has been particularly interested in understanding "quantum chaos," that is, the behavior of waves when the underlying classical dynamics is chaotic. Her current research program focuses on Laplacian eigenfunctions on large graphs.

f First Term · *s* Second Term · *m* Long-term Member · *v* Visitor · *vp* Visiting Professor
j Joint Member School of Natural Sciences · *vri* Veblen Research Instructorship · *vnf* von Neumann Fellowship

Stefanos Aretakis
Partial Differential Equations, Mathematical Physics · Institute for Advanced Study and Princeton University · *vri*

Stefanos Aretakis is interested in hyperbolic partial differential equations that arise in Einstein's theory of general relativity. His main focus has been the study of stability and instability properties of the wave equation on black hole backgrounds. At the Institute, he plans to study the black hole stability and uniqueness problem.

Steve Awodey
Univalent Foundations · Carnegie Mellon University
Friends of the Institute for Advanced Study Member; additional funding provided by the Charles Simonyi Endowment

Steve Awodey is investigating connections between logic and homotopy theory. He uses methods from higher category theory to relate constructive type theories and Quillen model categories.

Nils A. Baas
Algebraic Topology, Systems Biology · Norwegian University of Science and Technology · *j, s*

Nils Baas plans to study the use of higher order structures in topology and geometry, especially in relation to new K-theories, generalized bundles and cobordism categories. In systems biology, Baas plans to look for structures in genomic data.

Bruno Barras
Theoretical Computer Science · Institut National de Recherche en Informatique et en Automatique · *f*

Bruno Barras is working on the formalization of set-theoretical models of type theory. During his stay at the Institute, he will study the extension of the calculus of inductive constructions with Voevodsky's univalence axiom.

Andrej Bauer
Logic, Computation · University of Ljubljana · *f*

Andrej Bauer is broadly interested in computation and the computational nature of mathematics, approaching the subject through logic, category theory, type theory, and constructive mathematics. He also works on mathematical foundations of programming languages with emphasis on their mathematical semantics.

f First Term · *s* Second Term · *m* Long-term Member · *v* Visitor · *vp* Visiting Professor
j Joint Member School of Natural Sciences · *vri* Veblen Research Instructorship · *vnf* von Neumann Fellowship

Marius Beceanu
Partial Differential Equations · Rutgers, The State University of New Jersey
Funding provided by the National Science Foundation

Marius Beceanu studies the global behavior of solutions to evolution partial differential equations, such as the wave and Schrödinger's equation. This includes questions related to the global existence, asymptotic stability, and scattering of large solutions.

Costante Bellettini
Mathematics and Geometric Analysis · Institute for Advanced Study and Princeton University · *vri*
Funding provided by the Giorgio and Elena Petronio Fellowship Fund and the National Science Foundation

Costante Bellettini's research focuses on regularity questions in geometric measure theory, particularly calibrated currents and the role that they play in several geometric problems, such as invariants of manifolds and gauge theory.

Yves Bertot
Computer Science · Institut National de Recherche en Informatique et en Automatique · *s*
Funding provided by the Charles Simonyi Endowment

Yves Bertot works on programming languages, foundations, type theory, and formalized mathematics. He concentrates on the calculus of constructions as implemented in the Coq system and studies its expressive power, especially concerning real numbers, geometry, and the termination of algorithms.

Marc Bezem
Mathematical Logic, Computer Science · University of Bergen · *s*

Marc Bezem studies logic and computer science with an emphasis on type theory, constructive mathematics, and the mechanization of reasoning. At the Institute, he will work on the univalent foundations of mathematics from the viewpoint of formalizing mathematics.

Bhargav Bhatt
Arithmetic Algebraic Geometry · Institute for Advanced Study
Funding provided by the National Science Foundation

Bhargav Bhatt is interested in arithmetic geometry, especially in the p-adic context. At the Institute, he will study the interactions between arithmetic geometry, commutative algebra, and the newly emerging subject of derived algebraic geometry.

f First Term · *s* Second Term · *m* Long-term Member · *v* Visitor · *vp* Visiting Professor
j Joint Member School of Natural Sciences · *vri* Veblen Research Instructorship · *vnf* von Neumann Fellowship

Jochen Wulf Bruening

Differential Geometry, Geometric Analysis · Humboldt–Universität zu Berlin · *f*

Funding provided by the Charles Simonyi Endowment

Jochen Bruening will work on the spectral theory of Dirac operators defined on compact Riemannian pseudomanifolds. The main objectives are localized index formulas and geometric properties that are determined by the spectrum; an important point concerns finding a convenient description of the space of admissible metrics.

Aynur Bulut

Partial Differential Equations, Harmonic Analysis · Institute for Advanced Study · *f*

Funding provided by the National Science Foundation; additional funding provided by the Fernholz Foundation

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

Marc Burger

Lie Groups · Eidgenössische Technische Hochschule Zürich · *s*

At the Institute, Marc Burger plans to work on questions pertaining to the realm of thin groups in the framework of higher Teichmüller theories.

Jing Chen

Computer Science · Institute for Advanced Study

Zurich Financial Services Member; additional funding provided by the National Science Foundation

Jing Chen's research is in theoretical computer science. Her main interests are game theory and mechanism design. She is also interested in cryptography, algorithms, computational complexity, and secure hardware.

Tsao-Hsien Chen

Representation Theory · Institute for Advanced Study

Funding provided by the National Science Foundation

Tsao-Hsien Chen is working on geometric Langlands in positive characteristic and representation of affine Lie algebra at critical level. He plans to study geometric Hecke correspondence in positive characteristic and character formulas for irreducible highest weight modules at critical level.

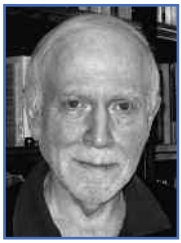
f First Term · *s* Second Term · *m* Long-term Member · *v* Visitor · *vp* Visiting Professor
j Joint Member School of Natural Sciences · *vri* Veblen Research Instructorship · *vnf* von Neumann Fellowship

Thierry Coquand

Type Theory and Constructive Mathematics · University of Gothenburg

Funding provided by the Ellentuck Fund and the Charles Simonyi Endowment

Thierry Coquand's research is about the foundation and formalization of mathematics, mainly using ideas from type theory. During his stay, he would like to understand if one can justify constructively Voevodsky's axiom of univalence, and to explore the formalization of mathematics in the univalent foundation.



Percy A. Deift

Mathematical Physics · Courant Institute of Mathematical Sciences, New York University · *s*

Funding provided by the Charles Simonyi Endowment

Percy Deift's main interests are in integrable systems, random matrix theory, and related areas. He is also interested in problems in partial differential equation with analysis.

Andrew Drucker

Computer Science · Institute for Advanced Study

Funding provided by the National Science Foundation

Andrew Drucker studies the complexity of computational tasks. He is also interested in understanding the power of various computational resources, such as randomness and interaction with provers.

Klim Efremenko

Computer Science · Institute for Advanced Study

Funding provided by the National Science Foundation and the Charles Simonyi Endowment

Klim Efremenko's research areas are theoretical computer science, abstract algebra, and the interaction between them. He plans to develop algebraic tools that will allow him to study local properties of the error correcting codes.

Eric Lee Finster

Mathematics · Institute for Advanced Study

Funding provided by the National Science Foundation

Eric Finster's research has focused on the connections between homotopy theory, higher category theory, and computer science. He is interested in the formalization of homotopy theoretic ideas in proof assistants and the relationship between type theories and coherence issues in higher category theory, both of which he plans to pursue at the Institute.

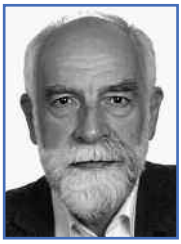
f First Term · *s* Second Term · *m* Long-term Member · *v* Visitor · *vp* Visiting Professor
j Joint Member School of Natural Sciences · *vri* Veblen Research Instructorship · *vnf* von Neumann Fellowship

Charles Frances

Conformal Geometry, Pseudo-Riemannian Geometry · Université Paris-Sud 11 · *s*

The Bell Companies Fellowship; additional funding provided by the Charles Simonyi Endowment

Charles Frances is interested in rigid geometric structures in general, and more particularly in conformal geometry. He studies dynamical properties of the automorphism group, and the interplay between the dynamics and the underlying geometric structure.



Jürg Fröhlich

Theoretical and Mathematical Physics · Eidengenössische Technische Hochschule Zürich · *vp*

Funding provided by The Ambrose Monell Foundation

Jürg Fröhlich's field of specialization is theoretical and mathematical physics. During his stay at the Institute, he plans to focus on problems in quantum theory, statistical mechanics, and transport theory. His interests overlap with those of Thomas Spencer.

Radhika Ganapathy

Number Theory · Institute for Advanced Study

Funding provided by the National Science Foundation; additional funding provided by the Fernholz Foundation

Radhika Ganapathy's research interests lie in the representation theory of p-adic groups in the context of the Langlands program. Ganapathy's current research focuses on understanding the local Langlands conjecture for the group GSp(4,F), where F is a nonarchimedean local field of characteristic p.

David Geraghty

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

Funding provided by the National Science Foundation

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

Marian Gidea

Dynamical Systems · Northeastern Illinois University

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

f First Term · *s* Second Term · *m* Long-term Member · *v* Visitor · *vp* Visiting Professor
j Joint Member School of Natural Sciences · *vri* Veblen Research Instructorship · *vnf* von Neumann Fellowship

Wushi Goldring

Number Theory, Galois Representations, Automorphic Forms · Institute for Advanced Study · *f*

Funding provided by the Oswald Veblen Fund

Wushi Goldring studies parts of the relationship between Galois representations and automorphic forms, also known as the Langlands program. More specifically, he is most interested in associating Galois representations to automorphic representations whose Archimedean component is a limit of discrete series.

Mark Goresky

Geometry, Automorphic Forms · Institute for Advanced Study · *m*

Funding provided by the James D. Wolfensohn Fund

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

Daniel Grayson

Mathematics · University of Illinois at Urbana-Champaign

AMIAS Member; additional funding provided by the Charles Simonyi Endowment

Daniel Grayson's research focuses on algebraic K-theory and its connection with motivic cohomology. He has also helped write mathematical software, including Mathematica and Macaulay2. At the Institute, he will help develop homotopy type theory and related software into a useful tool for verifying the proofs of modern mathematics.

Robert Guralnick

Group Theory and Representation Theory · University of Southern California · *v*

Robert Guralnick works on the linear and permutation representation theory of finite and algebraic groups. He is currently working on obtaining bounds for low degree cohomology with applications to presentations. Much of the motivation comes from problems in algebraic and arithmetic geometry and number theory.

Philipp Habegger

Number Theory · Goethe-Universität Frankfurt am Main · *vnf, s*

Funding provided by the National Science Foundation

Height functions are useful for "bookkeeping" when solving diophantine equations but also have interesting intrinsic properties. They played an important role in resolving the Mordell conjecture and its generalizations. Philipp Habegger's research includes applications to conjectures on unlikely intersections and the distribution of height values.

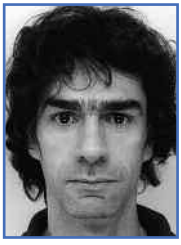
f First Term · *s* Second Term · *m* Long-term Member · *v* Visitor · *vp* Visiting Professor
j Joint Member School of Natural Sciences · *vri* Veblen Research Instructorship · *vnf* von Neumann Fellowship

Julia Hartmann
Algebra · RWTH Aachen University · *vnf, f*
Funding provided by the National Science Foundation

Julia Hartmann's current research deals with local-global principles for Galois cohomology over arithmetic function fields, using so-called patching techniques. Her plan is to generalize these techniques to higher dimensional situations and to obtain new applications. She is also interested in differential algebra and invariant theory.

Doris Hein
Symplectic Geometry · University of California, Santa Cruz
Funding provided by the National Science Foundation

Doris Hein is working in symplectic geometry and its applications in Hamiltonian dynamics. She plans to study the existence of infinitely many periodic orbits of Hamiltonian systems and to apply similar tools to periodic orbits of Reeb flow on contact manifolds.



Hugo Herbelin
Computer Science · Institut National de Recherche en Informatique et en Automatique · *f*

Hugo Herbelin's research focuses on the correspondence between proofs and programs. On a foundational side, he is currently investigating the relations between forcing and memory effects and between choice and lazy evaluation. On a more applied side, he is contributing to the implementation of proof assistants, such as Coq.

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

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

Yi Hu
Analysis · Institute for Advanced Study
Funding provided by the National Science Foundation

During his stay at the Institute, Yi Hu will study the discrete Fourier restriction phenomenon on paraboloids and spheres, as well as the well-posedness and long-time behavior of some associated periodic partial differential equations.

f First Term · *s* Second Term · *m* Long-term Member · *v* Visitor · *vp* Visiting Professor
j Joint Member School of Natural Sciences · *vri* Veblen Research Instructorship · *vnf* von Neumann Fellowship

Hao Huang

Combinatorics, Theoretical Computer Science · Institute for Advanced Study

Funding provided by the National Science Foundation

Hao Huang's research interests mainly focus on problems from extremal graph and hypergraph theory, random structures, and applications of algebraic and probabilistic tools in combinatorics. Huang is also interested in problems on the interface of discrete mathematics and theoretical computer science.

Alessandra Iozzi

Lie Groups · Eidgenössische Technische Hochschule Zürich · *s*

The Robert and Luisa Fernholz Visiting Professor

Alessandra Iozzi currently is interested in these topics of research: 1) higher Teichmüller theories (generalizations to Hermitian Lie groups of properties or characterizations of classical Teichmüller space) 2) actions on CAT(0) cube complexes 3) multiplicative representations of free groups, virtually free groups, and more generally Gromov hyperbolic groups.

André Joyal

Category Theory, Homotopy Theory, Logic · Université du Québec à Montréal · *s*

Funding provided by the Charles Simonyi Endowment

André Joyal is working on the applications of category theory to homotopy theory, higher category theory, operads, and Koszul duality. He is interested in the foundation of homotopical logic. He plans to collaborate with Steve Awodey, Thierry Coquand, and Vladimir Voevodsky in the univalent foundations program.

Tasho Kaletha

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

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

Payman Kassaei

Arithmetic Geometry · King's College London · *v, f*

Payman Kassaei investigates the geometry of arithmetic varieties and employs them to study automorphic forms, especially from a p-adic viewpoint. A major theme in his work has been to devise methods to prove the classicality of p-adic automorphic forms. At the Institute, he will further pursue this line of work and its recent generalizations.

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Gillat Kol
Theory of Computation · Weizmann Institute of Science · *v, f*

Gillat Kol is interested in complexity theory, with a focus on interactive proofs, probabilistically checkable proofs, and hardness of approximation.

Dieter Kotschick
Geometry and Topology · Ludwig-Maximilians-Universität München
Funding provided by the Oswald Veblen Fund

Dieter Kotschick expects to work on the topology of complex algebraic varieties and Kähler manifolds, studying questions on characteristic classes and Hodge structures, on rational domination, and on fundamental groups.

Ravishankar Krishnaswamy
Theoretical Computer Science · Princeton University · *v*

Ravishankar Krishnaswamy's interests are in theoretical computer science. More specifically, he is interested in exploring the approximability of basic problems that arise in combinatorial optimization.

Pierre Le Boudec
Number Theory · Institute for Advanced Study
Funding provided by the National Science Foundation

Pierre Le Boudec's research has been so far mainly focused on the study of the distribution of rational points on algebraic varieties. He is also interested in analytic number theory in a broad sense.

Michael Lesnick
Applied Algebraic Topology · Institute for Advanced Study
Funding provided by the National Science Foundation

Michael Lesnick's research focuses on the theoretical foundations of topological data analysis. Currently, he is interested in studying pseudometrics on diagrams of topological spaces, called interleaving distances, which arise naturally in the study of topological inference.

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Dong Li
Mathematical Physics, Fluid Dynamics · The University of British Columbia · *vnf*
Funding provided by the National Science Foundation

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

Jing Li
Applied Mathematics · Institute for Advanced Study · *v*

Jing Li's research in applied mathematics is concerned with using mathematical techniques (e.g., ordinary differential equations, partial differential equations, delay differential equations, game theory, etc.) to describe, understand, and predict the dynamics of biological systems in a variety of settings related to epidemiology, ecology, and immunology, as well as in the study of economic and logistical issues involved in infectious disease management.

Dan Licata
Computer Science · Institute for Advanced Study
Funding provided by the National Science Foundation and the Oswald Veblen Fund

Dan Licata will work on the theory and implementation of proof assistants for homotopy type theory, including the computational content of the univalence axiom and higher-dimensional inductive types, and applications in computer science to generic programming.

Shachar Lovett
Computer Science · Institute for Advanced Study · *f*
Funding provided by the Oswald Veblen Fund

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

Peter LeFanu Lumsdaine
Categorical Logic and Formalization of Mathematics · Institute for Advanced Study
Funding provided by the National Science Foundation

Peter Lumsdaine's main work this year is in Voevodsky's univalent foundations group, on the formalization and proof theory of homotopy type theory. Other interests include higher category theory, traditional constructive logic, and categorical approaches to quantum computing.

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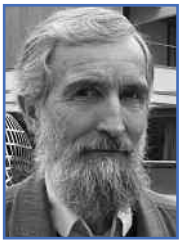
Assia Mahboubi

Theoretical Computer Science · Institut National de Recherche en Informatique et en Automatique · *vnf, f*

Funding provided by the National Science Foundation

Assia Mahboubi is interested in the foundations of mathematics, particularly in type theory. She works on the formalization of mathematics as computer checked libraries using proof assistants.



Per Martin-Löf

Logic · Stockholm University · *f*

While at the Institute, Per Martin-Löf will work on extending his constructive type theory with spreads and choice sequences, the key notions of the novel approach to topology that Brouwer conceived during the First World War, soon after Hausdorff's introduction of set-theoretic topology in 1914.

Mark McLean

Differential Geometry · Institute for Advanced Study · *f*

Mark McLean is interested in the interaction between symplectic geometry and algebraic/analytic geometry.

Or Meir

Computer Science · Institute for Advanced Study

Funding provided by the National Science Foundation and the Oswald Veblen Fund

Or Meir is interested in all areas of theoretical computer science, particularly in complexity theory, probabilistically checkable proofs, coding theory, and derandomization.

Raghu Meka

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

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

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Sergey Melikhov
Geometric Topology, Homotopy Type Theory · Steklov Mathematical Institute, Russian Academy of Sciences · *s*

Sergey Melikhov works in geometric topology, focusing recently on combinatorial embedding theory, algebraic topology of the group of p-adic integers, and foundational issues. At the Institute, he intends to study geometric aspects of homotopy type theory, aiming at a more combinatorial setup and at clarifying the role of simple homotopy.

Manor Mendel
Metric Geometry, Theoretical Computer Science · The Open University of Israel · *vnf*
Funding provided by the National Science Foundation

Manor Mendel currently is interested mostly in metric invariants and applications of metric geometry to theoretical computer science.

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

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

Sophie Morel
Shimura Varieties · Princeton University · *v*

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.

Jelani Nelson
Theoretical Computer Science · Institute for Advanced Study
Funding provided by the National Science Foundation

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

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Stefan Patrikis
Number Theory · Institute for Advanced Study
Funding provided by the National Science Foundation

Stefan Patrikis is interested in the relationships between automorphic forms, Galois representations, and motives. He has worked on a parallel lifting problem in the three settings, and on understanding examples that reflect the limits of the conjectural dictionaries between them. A closely related interest is monodromy of l-adic Galois representations.

Alvaro Pelayo
Symplectic Geometry, Special Theory of Integrable Systems · Washington University in St. Louis · *v/f, s*
Funding provided by the National Science Foundation

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

Andrew Polonsky
Computer Science · Institute for Advanced Study · *s*
Funding provided by the National Science Foundation

Coming from a background in untyped lambda calculus, Andrew Polonsky is interested in all topics of modern type theory. During his stay at the Institute, he intends to work on the computational interpretation of univalence.

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

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

Sivaguru Ravisankar
Several Complex Variables · Institute for Advanced Study
Funding provided by the James D. Wolfensohn Fund

Sivaguru Ravisankar's research interests broadly lie in several complex variables. He plans to explore the tangential gain in regularity for a holomorphic function near the boundary of a smoothly bounded domain in mathbb{C}^{n}. Specifically, he is interested in studying this gain in Lipschitz, L_P, and Sobolev regularity classes.

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j Joint Member School of Natural Sciences · *vri* Veblen Research Instructorship · *vnf* von Neumann Fellowship

Ran Raz

Computational Complexity · Weizmann Institute of Science · *vp, f*
Neil Chriss and Natasha Herron Chriss Founders' Circle Visiting Professor; additional funding provided by the Charles Simonyi Endowment

Ran Raz's main research area is complexity theory with emphasis on proving lower bounds for computational models. More specifically, Raz is interested in Boolean and arithmetic circuit complexity, communication complexity, propositional proof theory, probabilistically checkable proofs, quantum computation and communication, and randomness and derandomization.

Arul Shankar

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

Arul Shankar is interested in number theoretic questions in the field of arithmetic statistics. In graduate school, he worked on questions regarding the distributions of the discriminants and class numbers of number fields, and the distribution of the ranks and sizes of Selmer groups of elliptic curves.

Tatyana Shcherbina

Mathematical Physics · Institute for Advanced Study
Funding provided by the National Science Foundation; additional funding provided by the Fernholz Foundation

Tatyana Shcherbina works in random matrix theory. She plans to study the local spectral properties of band matrices, in particular the local asymptotic behavior of the products of the characteristic polynomials.

Nick Sheridan

Symplectic Geometry · Institute for Advanced Study and Princeton University · *vri*
Funding provided by the National Science Foundation

Nick Sheridan works on symplectic geometry, especially homological mirror symmetry. While at the Institute, he plans to use tropical geometry to study invariants of symplectic manifolds, like symplectic cohomology and the Fukaya category.

Michael Shulman

Mathematics · Institute for Advanced Study
Funding provided by the National Science Foundation

Michael Shulman is interested in higher category theory and homotopy theory and their applications to the rest of mathematics. At the Institute, he plans to study homotopical type theory and univalent foundations, particularly as a foundational system and as an internal language for higher toposes.

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Ali Kemal Sinop
Theoretical Computer Science · Institute for Advanced Study · *v*

Ali Sinop's research interests are in approximation algorithms, hardness of approximation, and linear algebra. Currently, he is working on the use of hierarchies of convex relaxations for graph partitioning problems.

Christopher Skinner
Number Theory · Princeton University · *v*

Christopher Skinner's research focuses mainly on Galois representations and automorphic forms and their applications to algebraic number theory, especially special values of L-functions.

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

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

Matthieu Sozeau
Computer Science · Institute for Advanced Study · *f*
Funding provided by the Charles Simonyi Endowment

Matthieu Sozeau is one of the main developers of the Coq proof-assistant, currently used as the basis of the univalent foundations program. His plan is to work on adapting the theory and implementation of Coq to homotopy type theory, including an adequate universe system and facilities for rewriting and proving in this new setting.

Bas Spitters
Mathematics and Computer Science · Radboud University Nijmegen · *s*

Bas Spitters's research interests are in the use of logic, type theory, and topos theory, in analysis and topology. He applies these methods to the formalization of mathematics and the foundations of quantum physics.

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Christine J. Taylor

Evolutionary Game Theory, Evolution of Cooperation · Institute for Advanced Study and Princeton University

Funding provided by the Fernholz Foundation

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

Mina Teicher

Algebraic Geometry · Bar-Ilan University · *v*

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

Benno van den Berg

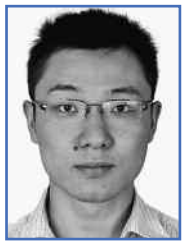
Mathematics · Utrecht University · *s*

Benno van den Berg's research is in mathematical logic and category theory, with applications to mathematics and computer science. During his stay, he will work on Voevodsky's univalent foundations for mathematics with the purpose of developing its semantics, its connections with higher-dimensional category theory, as well as its implementation as a proof assistant.

Ilya Volkovich

Theoretical Computer Science · Technion–Israel Institute of Technology · *v*

Ilya Volkovich's research interests lie in the area of theoretical computer science, more specifically, the question of derandomization, the roles of randomness and algebraic tools in computation, and algebraic problems in computer science. His interests also include some aspects of game theory.



Xin Wan

Number Theory · Institute for Advanced Study

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

Xin Wan is interested in the relations between special values of L-functions and Selmer groups, more concretely, the Bloch-Kato conjectures and Iwasawa main conjectures for unitary groups.

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Fang Wang

Microlocal Analysis, Geometric Scattering Theory, General Relativity, Partial Differential Equations · Institute for Advanced Study and Princeton University · *vri*

Funding provided by the National Science Foundation

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

Michael A. Warren

Computer Science, Homotopy Theory · Institute for Advanced Study

Funding provided by the Oswald Veblen Fund

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

Jun Yu

Computer Science · Institute for Advanced Study · *s*

Funding provided by the National Science Foundation

Jun Yu is interested in branching problem for representations; currently, he is working on applying the idea of stability and moment map to the study of this problem. He is also interested in some questions about algebraic vector bundles and diophantine approximations.

Eduard Zehnder

Analysis, Dynamical System, Symplectic Geometry · Eidgenössische Technische Hochschule Zürich

Funding provided by the Charles Simonyi Endowment

Eduard Zehnder's fields of interests are dynamical systems, in particular Hamiltonian systems and symplectic geometry. He plans to continue the joint work with Helmut Hofer and Kris Wysocki on the symplectic field theory.

Noam Zeilberger

Computer Science · Institute for Advanced Study

Funding provided by the National Science Foundation

Noam Zeilberger is interested broadly in the connections between logic and language and computation, and will participate in the univalent foundations project during his stay at the Institute. His work has focused on understanding computational duality and the problem of side-effects within the context of type theory.

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Aleksey Zinger

Symplectic Topology and Algebraic Geometry · Stony Brook University, The State University of New York

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

David Zywina

Number Theory · Institute for Advanced Study

Funding provided by the National Science Foundation

David Zywina works in arithmetic geometry with strong influences from Galois theory and analytic number theory. He is currently studying the images of Galois representations arising from abelian varieties with a particular focus on elliptic curves.

School of Natural Sciences

Administrative Officer: Michelle Sage

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

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

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

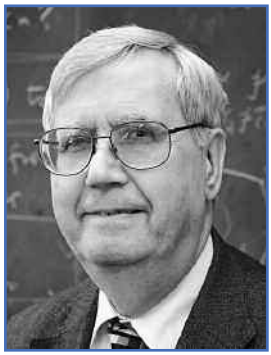
The Simons Center for Systems Biology takes an interdisciplinary approach to biology, conducting research at the interface of molecular biology and the physical sciences and drawing researchers from an array of disciplines, including mathematics, physics, astrophysics, molecular biology, and chemistry.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

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

Nima Arkani-Hamed

Professor · Particle Physics

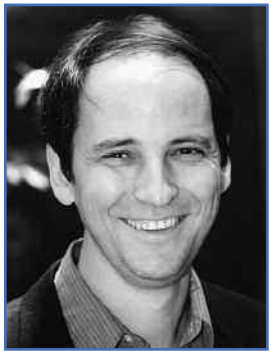
One of the leading particle physics phenomenologists of his generation, Nima Arkani-Hamed is concerned with the relation between theory and experiment. His research has shown how the extreme weakness of gravity, relative to other forces of nature, might be explained by the existence of extra dimensions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



Peter Goddard

Professor · Mathematical Physics

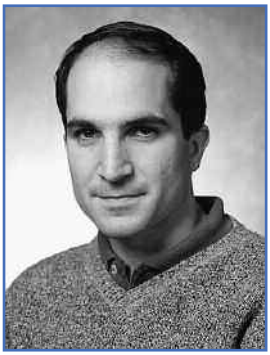
Peter Goddard's research concerns quantum field theory and string theory. With his collaborators, he has made pioneering contributions to these areas, including string quantization and its inconsistency, electric-magnetic duality in gauge theories, the construction of conformal field theories, and the realization of gauge symmetry in string theory. Before serving as the eighth Director (2004–12) of the Institute, he was Master of St. John's College and Professor of Theoretical Physics in the University of Cambridge, England, where he played a leading role in establishing the Isaac Newton Institute for Mathematical Sciences and the University of Cambridge Centre for Mathematical Sciences.



Stanislas Leibler

Professor · Biology

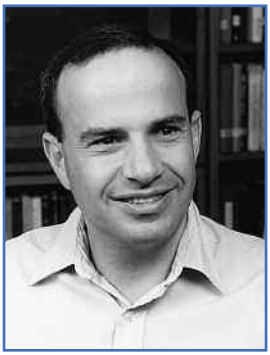
Stanislas Leibler has made important contributions to theoretical and experimental biology, successfully extending the interface between physics and biology to develop new solutions and approaches to problems. Interested in the quantitative description of microbial systems, both on cellular and population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



Juan Maldacena

Professor · Theoretical Physics

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



Nathan Seiberg

Professor · Mathematical Physics

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

Scott Tremaine

Richard Black Professor · Astrophysics

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

Edward Witten

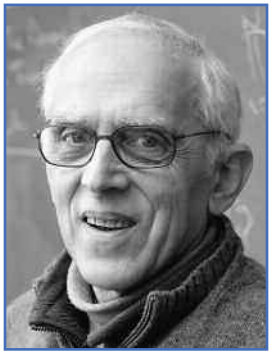
Charles Simonyi Professor · Mathematical Physics

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

Matias Zaldarriaga

Professor · Astrophysics and Cosmology

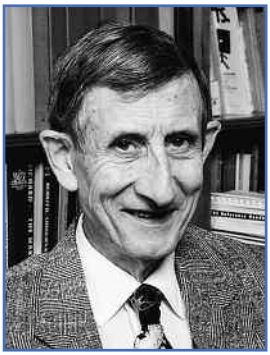
Matias Zaldarriaga has made many influential and creative contributions to our understanding of the early universe, particle astrophysics, and cosmology as a probe of fundamental physics. Much of his work centers on understanding the clues about the earliest moments of our universe encoded in the Cosmic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



Stephen L. Adler

Professor Emeritus · Particle Physics

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



Freeman J. Dyson

Professor Emeritus · Mathematical Physics and Astrophysics

Freeman Dyson's work on quantum electrodynamics marked an epoch in physics. The techniques he used in this domain form the foundation for most modern theoretical work in elementary particle physics and the quantum many-body problem. He has made highly original and important contributions to an astonishing range of topics, from number theory to adaptive optics. His most recent research, in collaboration with William Press of the University of Texas, found new strategies for Prisoners' Dilemma, a game used by population biologists as a model for the evolution of cooperation.

Peter Goldreich

Professor Emeritus · Astrophysics

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

Arnold J. Levine

Professor Emeritus · Biology

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

Ofer Haim Aharony

Particle Physics · Weizmann Institute of Science
IBM Einstein Fellow

Ofer Aharony will continue his research work in theoretical high-energy physics, focusing on a better understanding of strongly coupled field theories, string theories, and the relations between them. He intends to work on confinement in strongly coupled gauge theories (such as quantum chromodynamics) and the dual string theory description of free field theories.

Yacine Ali-Haïmoud

Theoretical Astrophysics, Cosmology · Institute for Advanced Study
Frank and Peggy Taplin Member; additional funding provided by the National Science Foundation

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

Nils A. Baas

Algebraic Topology, Systems Biology · Norwegian University of Science and Technology · *s*

Nils Baas plans to study the use of higher order structures in topology and geometry, especially in relation to new K-theories, generalized bundles, and cobordism categories. In systems biology, Baas plans to look for structures in genomic data.

Till Bargheer

Quantum Field Theory, String Theory · Uppsala University
European Commission Marie Curie Fellowship

Till Bargheer studies the hidden symmetries and integrable structures that emerge in maximally supersymmetric Yang-Mills theory and its string dual. In particular, he wants to understand how correlation functions, scattering amplitudes, and Wilson loops in the planar theory are governed by the strong constraints imposed by integrability.

Simeon Paul Bird

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

Simeon Bird works on simulations of the Lyman-alpha and of the matter power spectrum, focusing on the impact of cosmological parameters. He is also interested in inflation.

f First Term · *s* Second Term · *m* Long-term Member
v Visitor · *vp* Visiting Professor · *j* Joint Member School of Mathematics

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

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

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

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

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

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

Lucy J. Colwell
Applied Mathematics and Biology · MRC Laboratory of Molecular Biology

Lucy Colwell is interested in using and developing mathematical techniques to better understand the relationship between biological sequence and phenotype, in particular at the level of proteins and protein complexes.

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

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

f First Term · *s* Second Term · *m* Long-term Member
v Visitor · *vp* Visiting Professor · *j* Joint Member School of Mathematics

Tudor Dan Dimofte

Mathematical and Particle Physics · Institute for Advanced Study · *f*
William D. Loughlin Member; additional funding provided by the United States Department of Energy

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

Subo Dong

Astrophysics · Institute for Advanced Study · *m*
Ralph E. and Doris M. Hansmann Member

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

Cora Dvorkin

Cosmology, Astrophysics · Institute for Advanced Study
Funding provided by the W. M. Keck Foundation Fund and the National Science Foundation

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

Thomas Faulkner

Theoretical Physics · University of California, Santa Barbara
Funding provided by the National Science Foundation

Thomas Faulkner is interested in black holes and the holographic correspondence, in particular their use as tools for understanding strongly correlated phenomena in quantum field theory. He is excited by attempts to understand certain finite density phases of matter using these tools.

Rodrigo Fernandez

Astrophysics · Institute for Advanced Study · *m*
Funding provided by the National Science Foundation

Rodrigo Fernandez is interested in theoretical astrophysics at the stellar scale. His research makes use of numerical simulations to gain insight into complex astrophysical systems. Currently, he works on the explosion mechanism of core-collapse supernovae, the X-ray emission from neutron stars, and the nuclear physics of compact object mergers.

f First Term · *s* Second Term · *m* Long-term Member
v Visitor · *vp* Visiting Professor · *j* Joint Member School of Mathematics

Guido Festuccia

High-Energy Theoretical Physics · Institute for Advanced Study
Marvin L. Goldberger Member; additional funding provided by the National Science Foundation

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

Raphael Flauger

Theoretical Physics · Institute for Advanced Study

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

Benjamin Greenbaum

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

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

Daniel Grin

Cosmology, Theoretical Astrophysics · Institute for Advanced Study
Funding provided by NASA

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

Thomas Hartman

Particle Physics, String Theory · Institute for Advanced Study
Corning Glass Works Foundation Member; additional funding provided by the United States Department of Energy

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

f First Term · *s* Second Term · *m* Long-term Member
v Visitor · *vp* Visiting Professor · *j* Joint Member School of Mathematics

Johannes Henn

Particle Physics · Institute for Advanced Study · *m*

AMIAS Member; additional funding provided by the United States Department of Energy

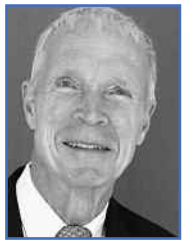
Johannes Henn's research focuses on supersymmetric quantum field theory and its relation to string theory. He is working on recently discovered dualities between scattering amplitudes, correlation functions of local operators, and Wilson loops with the aim of finding new hidden structures in the weak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

Anson Z. Y. Hook

Particle Physics · Stanford University

Funding provided by the United States Department of Energy

Anson Hook works on various aspects of particle physics including supersymmetry and collider physics. His interests range from optimizing Large Hadron Collider search strategies for new physics to general properties of quantum field theories.



John J. Hopfield

Biology · Princeton University · *vp*

Martin A. and Helen Chooljian Visiting Professor in Biology

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

Boaz Katz

Astrophysics · Institute for Advanced Study · *m*

John N. Bahcall Fellow; additional funding provided by the NASA Einstein Fellowship Program

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

Nakwoo Kim

Theoretical Physics · Kyung Hee University · *f*

Nakwoo Kim's main research area is superstring theory and supergravity. More specifically, Kim has worked on both quantum field theoretical and gravitational problems with AdS/CFT in mind. Kim is interested in constructing explicit supergravity solutions, classification of supersymmetric solutions, and the study of string duality in general through matrix model of M-theory.

f First Term · *s* Second Term · *m* Long-term Member
v Visitor · *vp* Visiting Professor · *j* Joint Member School of Mathematics

Matthew Kleban

Particle Physics · New York University
Funding provided by the W. M. Keck Foundation Fund

During his stay at the Institute, Matthew Kleban plans to focus on those aspects of string theory most relevant to cosmology with the ultimate goal of uncovering stringy effects that can be observed. In addition, he will study the physics of black hole and cosmological horizons and singularities using string theory dualities and other methods.

Zohar Komargodski

String Theory, Supersymmetry, Phenomenology · Institute for Advanced Study · *m*
Funding provided by the National Science Foundation

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

Graham Kribs

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

Graham Kribs is interested in theoretical particle physics beyond the Standard Model. The onset of experimental data from the Large Hadron Collider combined with experimental searches for dark matter are rapidly shaping and constraining physics beyond the Standard Model. Kribs expects to exploit these results to develop and understand what lies in the Terascale and beyond.

Doron Kushnir

Astrophysics · Weizmann Institute of Science
Funding provided by the National Science Foundation

Doron Kushnir's areas of interest include various problems within the field of high-energy astrophysics and, in particular, deflagration-to-detonation transitions in supernova explosions of type Ia and nonthermal processes in galaxy clusters.

Brian Cameron Lacki

Astrophysics · Institute for Advanced Study
National Radio Astronomy Observatory Jansky Fellowship

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

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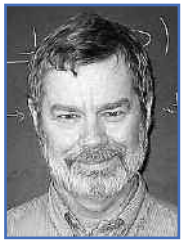


Paul Langacker

Particle Physics · Institute for Advanced Study · *v*

Paul Langacker will explore the physics implications of concrete string constructions. This will include possibilities for extended gauge, Higgs, fermion, quasi-hidden sectors for collider physics, and nonstandard mechanisms for generating neutrino mass. He is also completing an advanced textbook on "The Standard Model and Beyond."

Albert Libchaber

Biology · The Rockefeller University · *vp*

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

Sergio Lukic

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

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

Elke Katrin Markert

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

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

Gregory Moore

Mathematical Physics · Rutgers, The State University of New Jersey · *f*
Funding provided by The Ambrose Monell Foundation

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

f First Term · *s* Second Term · *m* Long-term Member
v Visitor · *vp* Visiting Professor · *j* Joint Member School of Mathematics

Kohta Murase

Astroparticle Physics · The Ohio State University
Space Telescope Science Institute Hubble Fellow

Kohta Murase works on revealing the origins of high-energy particles propagating in the universe and understanding the underlying mechanisms. In particular, he intends to continue his study of violent cosmic explosions including gamma-ray bursts and supernovae. He is also interested in exploring novel probes of dark matter and cosmic rays.

Jean-Claude Nicolas

Biology · Université Pierre et Marie Curie

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

Vasily Pestun

Theoretical Physics · Institute for Advanced Study
Roger Dashen Member; additional funding provided by the National Science Foundation

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

Rafael A. Porto

Theoretical Physics · Institute for Advanced Study
Funding provided by the National Science Foundation and the United States Department of Energy

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

Frans Pretorius

Theoretical Physics · Princeton University · *v*

Frans Pretorius's research area is general relativity, focusing on numerical modeling of astrophysical sources of gravitational waves and other topics of more theoretical interest, including higher dimensional black holes and AdS spacetimes.

f First Term · *s* Second Term · *m* Long-term Member
v Visitor · *vp* Visiting Professor · *j* Joint Member School of Mathematics

Rami Pugatch
Biology · Institute for Advanced Study

Rami Pugatch's research focuses on how cells process external information to grow while maintaining their metabolic homeostasis. He is interested particularly in the inherent tension between efficiency (yield) and growth rate and the way it is regulated as a function of the available information.

Shlomo S. Razamat
Theoretical Physics · Institute for Advanced Study
Martin A. and Helen Chooljian Member; additional funding provided by the National Science Foundation

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

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

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

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

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

James Rhoads
Astrophysics · Arizona State University · *v, s*

James Rhoads studies galaxy formation, galaxy evolution, the reionization of intergalactic hydrogen by early galaxies. He also studies the nature of gamma-ray bursters through the physics and phenomenology of their long wavelength afterglow emission.

f First Term · *s* Second Term · *m* Long-term Member
v Visitor · *vp* Visiting Professor · *j* Joint Member School of Mathematics

Amit Sever

String Theory, Quantum Field Theory · Perimeter Institute for Theoretical Physics

Funding provided by the United States Department of Energy

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

David Simmons-Duffin

Particle Physics · Harvard University

Funding provided by the United States Department of Energy

David Simmons-Duffin's work concerns conformal field theories in diverse dimensions with interest in both their phenomenological applications and implications for quantum gravity.

David Skinner

Mathematical Physics, Quantum Field Theory · University of Cambridge

IBM Einstein Fellow; additional funding provided by The Ambrose Monell Foundation

David Skinner is interested in quantum field theory and in gravity. More particularly, he is studying the rich geometric structure that lies behind gauge and gravitational scattering amplitudes, and in their relation to twistor theory and string theory.

Tracy Slatyer

Particle Physics, Astrophysics · Institute for Advanced Study

Funding provided by the National Science Foundation

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

Aristotle Socrates

Astrophysics · Institute for Advanced Study · *m*

John N. Bahcall Fellow

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

f First Term · *s* Second Term · *m* Long-term Member
v Visitor · *vp* Visiting Professor · *j* Joint Member School of Mathematics

David S. Spiegel

Exoplanetary Science · Institute for Advanced Study
Friends of the Institute for Advanced Study Member

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

Rashid Sunyaev

Astrophysics · Max-Planck Institute für Astrophysik · *vp*
Maureen and John Hendricks Visiting Professor

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

Tiberiu Tesileanu

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

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

Tsvi Tlusty

Biology · Institute for Advanced Study
Martin A. and Helen Chooljian Founders' Circle Member

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

Brian M. Willett

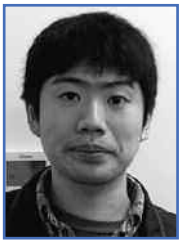
Particle Physics · California Institute of Technology
Funding provided by the United States Department of Energy

Brian Willett's research interests focus on quantum field theory and string/M-theory. In particular, he studies nonperturbative techniques in quantum field theories in order to understand strong-coupling phenomena such as dualities, a subject that has strong interactions with string/M-theory.

f First Term · *s* Second Term · *m* Long-term Member
v Visitor · *vp* Visiting Professor · *j* Joint Member School of Mathematics

Dan Xie
Particle Physics · Institute for Advanced Study
Funding provided by the United States Department of Energy

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



Kazuya Yonekura
Particle Physics · University of Tokyo
Funding provided by the National Science Foundation

Kazuya Yonekura's research concerns quantum field theory and particle physics phenomenology. He mainly is interested in studying strong dynamics of supersymmetric gauge theories and its applications to models beyond the standard model.

Kathryn Zurek
Particle Physics · University of Michigan · *v, f*

Kathryn Zurek works on theories of dark matter and ways that it can be detected in the lab by dark matter-nucleus interactions, at colliders through high-energy collisions, and in the galaxy by dark matter self-annihilations.

f First Term · *s* Second Term · *m* Long-term Member
v Visitor · *vp* Visiting Professor · *j* Joint Member School of Mathematics

School of Social Science

Administrative Officer: Donne Petito

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

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

In an attempt to create a sense of community among the Members, the School designates an annual theme, which is neither exclusive nor excluding. The theme for the 2012–13 academic year is "Economics and Politics." Economic and political matters are obviously closely connected. Indeed, the disciplines of economics and political science have their common origin in the field of political economy, which was premised on this inter-relationship. For many decades, however, each discipline took rather little notice of the other; the subjects evolved in more-or-less parallel universes. That has changed in recent years, which have seen a renaissance in the study of economics and politics together. Thus, for example, scholars have been investigating how political alignments induce and constrain economic policy—and, conversely, how economic conditions shape the growth of political movements and coalitions. A diverse group of eight to twelve scholars will examine positive issues like these, and normative questions, such as which political systems best promote economic welfare, as well as research on the history of political economy and political economists, the theories advanced in that field and their pertinence to what counts as political economy today. Under the direction of Visiting Professor Marco Battaglini, these are some issues the seminar will examine.

Danielle S. Allen

UPS Foundation Professor

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

Didier Fassin

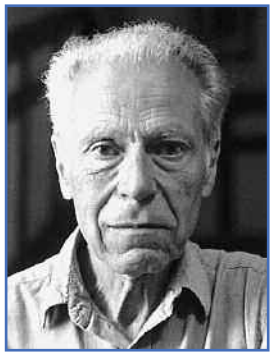
James D. Wolfensohn Professor

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

Joan Wallach Scott

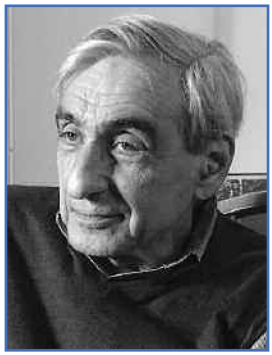
Harold F. Linder Professor

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



Albert O. Hirschman
Professor Emeritus

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



Michael Walzer
Professor Emeritus

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

Marco Battaglini

Economics · Princeton University · *vp*

Marco Battaglini is an economic theorist who has worked on problems of strategic communication, contractual design, and collective choice. His current research is focused on the study of dynamic economies with special emphasis on the political economy determinants of public investments, public debt, and taxation.

Lucas Bessire

Anthropology · University of Oklahoma

Lucas Bessire studies the contradictory ways that indigenous kinds of humanity are defined and governed in Latin America in order to describe how the category of culture increasingly delimits a reductive politics of legitimate life. How might we conceptualize an alternative foundation for a publicly relevant anthropology of indigeneity?

Venkataraman Bhaskar

Economics · University College London

Roger W. Ferguson Jr. and Annette L. Nazareth Member

Venkataraman Bhaskar's research will use matching models to understand the economic and social consequences of sex ratio imbalances in East and South Asia: on the position of women, the balance of power between sexes, and on parental investments in children. He also will analyze dynamic models of contracting that combine moral hazard with learning.

João Biehl

Anthropology · Princeton University · *v*

João Biehl is interested in the ethnography of global health interventions, and his current research explores the role of the Brazilian judiciary in the administration of public health. He also is writing the history of a religious war—the Mucker war—that took place among German immigrants in nineteenth-century Brazil.

Eric Chaney

Economics · Harvard University

Eric Chaney will investigate the mechanisms through which exploitative institutions both persist and dampen growth using microlevel institutional variation from the Kingdom of Valencia, Spain, from 1575 until the present day. Preliminary results suggest that these institutional arrangements decreased incomes, stymied the development of the nonagricultural sector, and increased criminal activity.

Alev Cinar

Political Science · Muğla University

Alev Cinar is examining the intellectual basis for the Islam-based politics of the ruling AKP in Turkey, and argues that its immense electoral success partly is due to its unique ideology that merges globalized/Western political thought with local Islamic knowledge.

Randall Curren

Philosophy · University of Rochester

Ginny and Robert Loughlin Founders' Circle Member

Randall Curren's work explores relationships between education, ethics, law, responsibility, and citizenship, often from starting points in the works of Plato and Aristotle. His current project concerns human flourishing and its educational enhancement. It theoretically integrates philosophical and psychological research on well-being and develops a general account of educational justice.

John M. de Figueiredo

Economics · Duke University

AMIAS Member

John de Figueiredo is studying how the policies of administrative agency are affected by employee expertise, politicization, and interest group participation. This research, which integrates recent work in political science and personnel economics, will complement his continuing work on money in politics and interest group lobbying of legislatures.

James Doyle

Philosophy · Institute for Advanced Study · *v*

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

Vincent Dubois

Political Sociology · Université de Strasbourg

Funding provided by the Florence Gould Foundation Fund

Vincent Dubois's sociological approach to public policy includes cultural sociology and policy, language policy, poverty and welfare. His current research program on welfare control and anti-fraud policies provides an original contribution to the analysis of the new balance between politics, economics, and morals that define the contemporary social state.

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

David L. Eng

Literature · University of Pennsylvania

David Eng is investigating reparations and human rights in Cold War Asia. Focusing on unexamined links between political and psychic genealogies of reparation, he is exploring the possibilities and limits of repairing war, violence, and colonialism in the wake of changing conceptions of the human being after genocide and nuclear holocaust.

Ruben Enikolopov

Economics · New Economic School, Moscow

Deutsche Bank Member

Ruben Enikolopov is analyzing the effect of the largest community-based development program in Afghanistan on improving the attitudes of villagers toward state institutions and government and examining whether newly created councils assume responsibilities of legitimate local governments and if their creation improves the quality of local governance.

Sara R. Farris

Sociology · University of Cambridge

Sara Farris is researching the contemporary mobilization of feminist ideas by right-wing nationalist parties in Europe, particularly its anti-Islamic dimensions. She calls this discursive formation "Femonationalism." She aims to reconstruct, analyze, and interpret this phenomenon with an interdisciplinary (sociological, political, and political-economic) framework.

Jessica Goldberg

Medieval History · University of Pennsylvania

Jessica Goldberg uses mercantile records to explore medieval geography not from the high culture of the literary record but as a practical problem. The business records of two twelfth-century communities—Jewish businessmen of Cairo and merchants of Genoa—show the Mediterranean from the eyes of those whose professions depended on the connections between places.

Neve Gordon

Political Science · Ben-Gurion University of the Negev

Recently, the Israeli-Palestinian conflict has assumed an increasingly pronounced economic dimension. Neve Gordon intends to examine the economic apparatuses (*dispositif*) of occupation, i.e., forms of governance and resistance deployed to harness or arrest the population's energy so as to achieve a series of sociopolitical objectives.

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

Jens Großer
Political Science, Economics · Florida State University

Jens Großer's project has two pillars: first, the development of a unified model of electoral competition and, second, a fundamental analysis of the coexistence of elections and markets. His objective is to contribute to a more fundamental knowledge of the political economy-at-large, using game theory and laboratory experiments.

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

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

Alexander V. Hirsch
Political Science · Princeton University

Alexander Hirsch uses game-theoretic methods to analyze how political actors identify and develop effective public policies despite their differing goals and beliefs. Currently, he is analyzing how legislative veto players can encourage entrepreneurial political actors to invest costly resources to develop high-quality legislation.

Moon-Kie Jung
Sociology · University of Illinois at Urbana-Champaign

Moon-Kie Jung's research focuses on racial inequality and domination. He is analyzing deeply naturalized practices of racism and deeply naturalized assumptions in the social-scientific study of racism.

Sheena Kang
Political Theory · The University of Chicago · *a*

Sheena Kang is interested in the relationship between language and politics, especially the role of official apologies in addressing historic injustice. She will explore themes such as recognition, responsibility, and political forgiveness in looking at states' willingness or reluctance to apologize.

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

Karin Knorr Cetina

Sociology · The University of Chicago · *v*

Karin Knorr Cetina studies (sometimes extreme) expert systems. She is completing a book on institutional currency markets as a global cultural and social form that is based on scopic media mechanisms and partial organization. She is also interested in the financial imagination as characterized by counterfactual thinking and in market morality.

Patchen Markell

Political Science · The University of Chicago

Patchen Markell is completing a study of Hannah Arendt's classic 1958 work of political theory, *The Human Condition*, placing her book into a variety of historical and intellectual contexts in order to draw out, among other things, its surprisingly radical critical engagement with Fordist capitalism.

Jens Meierhenrich

Political Science · London School of Economics and Political Science
Louise and John Steffens Founders' Circle Member

Jens Meierhenrich's project is an ethnography of the International Criminal Court through which he hopes to lay the foundations for a social theory of international law. It is dedicated to understanding (in a Weberian sense) the "social lives" of international courts and tribunals more generally.

Nicola Perugini

Anthropology · Al Quds Bard Honors College for Liberal Arts and Sciences
Richard B. Fisher Member

Nicola Perugini is exploring the dynamics of appropriation of the human rights discourses and practices by Israeli settlers in contemporary Israel/Palestine, focusing on how human rights discourses and practices progressively reduced the distance between violence perpetrators and victims in this study area.

Laurence Ralph

Anthropology · Harvard University

Laurence Ralph is preparing an ethnography that will cultivate a new analysis of the myriad effects of injury in the twenty-first century. It combines African-American studies, the scholarship on disability, and the field of critical medical anthropology to show how injury plays a central, though underexamined, role in the daily lives of poor urban blacks.

Michael Ralph

Anthropology · New York University
The Wolfensohn Family Member

Michael Ralph uses the concept of forensics to examine the criteria that international governing and lending agencies use to determine whether an individual, firm, or polity is credit-worthy or law-abiding. He is completing research on Senegal in which he explores the relationship between risk and liability that lies at the heart of modern governance.

Catherine Rottenberg

Harlem Renaissance Studies, Jewish American Studies · Ben-Gurion University of the Negev · *v*

Catherine Rottenberg's research bridges the fields of Jewish-American Studies and African-American Studies, focusing on early twentieth-century Jewish-American and African-American fiction. Her current project utilizes "the city" as an analytical category for examining the transformation of Jewish-American and African-American female identity during the Jazz Age.

Wen-Ching Sung

Medical Anthropology · University of Toronto · *v*

Wen-Ching Sung is a medical anthropologist working on biomedicine and Traditional Chinese Medicine (TCM). She plans to work on a book manuscript, "Producing Credits and Profits: Scientists' Flexible Identities and Moral Economies in China," based on her fieldwork at Beijing Genomics Institute (BGI).

Caroline Thomas

Economics · University of Texas at Austin
Deutsche Bank Member

Caroline Thomas's research focuses on game-theoretical models of strategic experimentation and learning when individuals compete for access to information. She currently is investigating the efficiency of two-sided matching-markets with signaling and studying information-aggregation and herding in sequential elections.

Peter D. Thomas

Political Philosophy · Brunel University · *v*

Peter Thomas's research at the Institute focuses on three central themes in the work of Gramsci, Laclau, Schmitt, and Foucault: the nature of politics and processes of politicization, the relationship between politics and the political, and the concept of the political subject.

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

Deva Woodly

Political Science · The New School
Friends of the Institute for Advanced Study Member

Deva Woodly's research focuses on the impact of civic discourse on democratic practice, especially from the point of view of ordinary citizens, political advocates, and social movements. Her current project is a discursive comparison of two contemporary social movements: the fight for marriage equality and the struggle for a living wage.

Everett Zhang

Anthropology · Princeton University

By comparing the Tangshan earthquake in 1976 and the Sichuan earthquake in 2008, Everett Zhang is exploring how different ways of mourning the loss of life make a huge difference in producing life's worthiness or unworthiness in China and how public grieving has become a crucial site of struggle for justice and well-being.

Program in Interdisciplinary Studies

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

FACULTY

Piet Hut

Professor

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

VISITORS

Jeff Ames

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

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

Jos de Mul

Philosophy · Erasmus University Rotterdam · *v, f*

Jos de Mul's work is on the interface of philosophical anthropology (and its history), philosophy of technology, and aesthetics. One of his main themes is the impact of information technologies on our worldview and self-understanding.

f First Term · *v* Visitor

Hyun Ok Park

Comparative and Historical Sociology, Political Economy, Critical Theory, Postcolonial Theory, Migration, Diaspora · York University · *v, f*

Hyun Ok Park is completing an investigation of the ways that the task of rapprochement of the two Koreas has been changed to the formation of ethnic sovereignty in the post–Cold War era. It concerns a democratic politics that imagines the market as a mechanism of reparation, peace, and human rights.

Edwin Turner

Astrophysics · Princeton University · *v*

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

f First Term · *v* Visitor

Director's Visitors

Director's Visitors contribute much to the vitality of the Institute. Scholars from a variety of fields, including areas not represented in the Schools, are invited to the Institute for varying periods of time, depending on the nature of their work. Funding for the Director's Visitors program for 2012–13 and 2013–14 has been generously provided by Maureen and John Hendricks.

Graham Farmelo

Writer; Adjunct Professor of Physics, Northeastern University; Bye-Fellow, Churchill College, University of Cambridge

Graham Farmelo is working on his next book. Its theme is Winston Churchill's role in developing the first nuclear weapons and his relationship with his nuclear scientists and the American government, until he left office in 1955. The book is scheduled to be published in the fall of 2013.

Artist-in-Residence Program

The Artist-in-Residence Program was established in 1994 to create a musical presence within the Institute community and to have in residence a person whose work could be experienced and appreciated by scholars from all disciplines. Derek Bermel continues as Artist-in-Residence, organizing "The Harmonic Series," the 2012–13 Edward T. Cone Concert Series, while pursuing his scholarly and creative interests and developing major work.

Derek Bermel

Composer, clarinetist, conductor, and jazz and rock musician

Derek Bermel, who was nominated for a Grammy Award in 2010, directs the Edward T. Cone Concert Series at the Institute. His orchestral piece *A Shout, a Whisper, and a Trace* will be performed by multiple orchestras throughout the year, including in Richmond, Tacoma, and Kalamazoo. A recording of his larger ensemble music performed by the group Alarm Will Sound will be released in October by Cantaloupe Music. He will host a panel at the prestigious Output electric-guitar festival in Amsterdam in December, and he is writing a commission for the JACK Quartet to be performed at Wolf Trap in January. This year Bermel will also serve as Composer-in-Residence at Mannes College the New School for Music, and he is creating an intensive all-scholarship annual workshop and mentoring program for young composers, CULTIVATE, based at Copland House.

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Index