IAS | INSTITUTE FOR ADVANCED STUDY

Faculty and Members
2017–2018

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

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

Cover: Common Room, Fuld Hall Photo: Andrea Kane
Opposite page: The Institute Woods Photo: Andrea Kane

Contents

Introduction

FROM THE DEVELOPMENT of programmable computers and the uncovering of the deep symmetries of nature to advances in societal understanding and historical practice, long and complex chains of knowledge have developed in numerous and astounding ways through research originating at the Institute for Advanced Study for nearly ninety years.

Work at the Institute takes place across historical studies, mathematics, natural sciences, and social science. Currently, a permanent Faculty of some thirty eminent academics each year award fellowships to some two hundred visiting Members, from about one hundred universities and research institutions throughout the world. The Institute's reach has been multiplied many times over through the more than seven thousand Members who have influenced entire fields of study as well as the work and minds of colleagues and students. Thirty-three Nobel Laureates, forty-one out of fifty-six Fields Medalists, and sixteen out of eighteen Abel Prize Laureates, as well as many winners of the Wolf and MacArthur prizes, have been affiliated with the Institute.

Each year a new intellectual mix is created by the Members, ranging from young postdoctoral fellows to distinguished senior professors, who typically stay a year but may stay up to five years and return for subsequent visits throughout their careers. A period spent as a Member is often a life-changing experience. Young scholars meet the contemporaries who, with them, will be leading figures in their field in the future. Senior Members have the time and freedom to initiate new lines of research. Freed from teaching and administration, Members are afforded opportunities for discussing their work with scholars and scientists from other fields. Here they are given the time to take advantage of serendipitous encounters at lunch, teatime, or at After Hours Conversations, an interdisciplinary program to encourage wide-ranging conversations in an informal and relaxed environment.

Albert Einstein, Kurt Gödel, Hetty Goldman, George F. Kennan, Erwin Panofsky, John von Neumann, and Hermann Weyl were among the first in a long line of distinguished Institute scientists and scholars to produce a deeper understanding of the physical world and of humanity. Yet the Institute's remarkable history does not seem to weigh heavily on current scholars and scientists. Instead, the atmosphere focuses on the present, where every twist and hairpin bend changes our view. What do we know? What do we yet need to understand? How should we try to comprehend it?

Located in Princeton, New Jersey, the Institute is a private, independent academic institution. Unlike universities, it has neither tuition nor intellectual property income, and its independence and excellence have been almost fully reliant on philanthropy. Founded in 1930 by brother-and-sister philanthropists Louis Bamberger and Caroline Bamberger Fuld, the Institute was established through the vision of founding Director Abraham Flexner. It was Flexner's belief that if the Institute

> eschews the chase for the useful, the minds of its scholars will be liberated, they will be free to take advantage of surprises, and someday an unexpected discovery, apparently leading nowhere, will be found to be an indispensable link in a long and complex chain that may open new worlds in theory and practice.

Flexner's vision has been maintained by his successors Frank Aydelotte (1939), 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.

At the Institute, everything is designed to encourage scholars to take their research to the next level. This includes creating and sustaining an environment where Members live in an academic village of apartments, originally designed by Marcel Breuer in 1957, at the edge of the Institute's eight hundred acres of campus, woodland, and farmland. Members eat in the same dining hall, share common rooms and libraries, and carry out their work in an institutional setting where human scale has been carefully maintained to encourage the sharing of ideas, mutual understanding, and friendship.

Robbert Dijkgraaf

Director and Leon Levy Professor

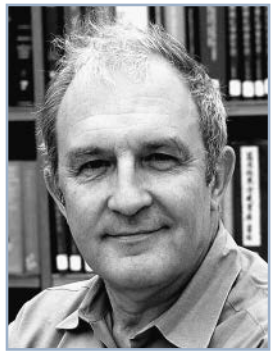
Robbert Dijkgraaf is a mathematical physicist who has made significant contributions to string theory and the advancement of science education. His research focuses on the interface between mathematics and particle physics. In addition to finding surprising and deep connections between matrix models, topological string theory, and supersymmetric quantum field theory, Dijkgraaf has developed precise formulas for the counting of bound states that explain the entropy of certain black holes. Past President (2008–12) of the Royal Netherlands Academy of Arts and Sciences and Co-Chair (since 2009) of the InterAcademy Council, Dijkgraaf is a distinguished public policy adviser and passionate advocate for science and the arts.

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 Asian 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.

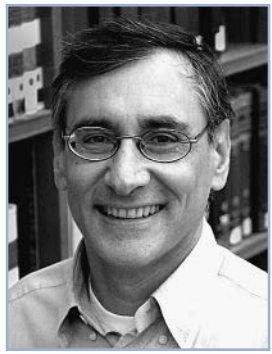
The Faculty and Members of the School do not adhere to any one point of view but practice a range of methods of inquiry and scholarly styles, both traditional and innovative. Uniquely positioned to sponsor work that crosses conventional departmental and professional boundaries, the School actively promotes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



Yve-Alain Bois

Professor · Art History

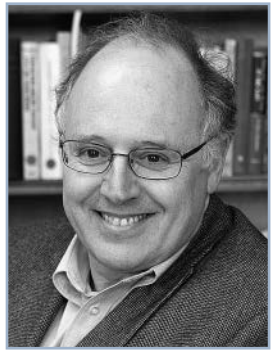
A specialist in twentieth-century European and American art, Yve-Alain Bois is recognized as an expert on a wide range of artists, from Henri Matisse and Pablo Picasso to Piet Mondrian, Barnett Newman, and Ellsworth Kelly. The curator of a number of influential exhibitions, he is currently working on several long-term projects, foremost among them the catalogue raisonné of Ellsworth Kelly's paintings and sculptures, the second volume (out of five) of which he plans to finish this year.



Angelos Chaniotis

Professor · Ancient History and Classics

Angelos Chaniotis is engaged in wide-ranging research in the social, cultural, religious, and legal 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.



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 works explore the use of proxy data from climatology and other palaeosciences in the study of the history of China and Central Asia, with special reference to early Eurasian nomads, the Mongol empire, and the Qing dynasty.

Patrick J. Geary

Andrew W. Mellon Professor · Medieval History

Patrick Geary's work extends over a vast range of topics in medieval history, both chronologically and conceptually—from religiosity and social memory 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. He has directed 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. 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-era cemeteries in Hungary and in Italy.

Jonathan Haslam

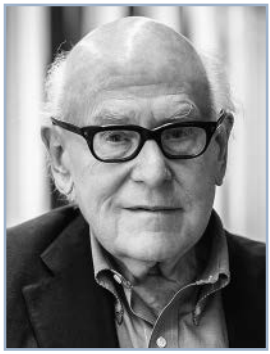
George F. Kennan Professor · International Relations

Jonathan Haslam is a leading scholar on the history of thought in international relations and the history of the Soviet Union whose work builds a bridge between historical studies and the understanding of contemporary phenomena through critical examinations of the role of ideology. His studies of Soviet foreign policy are expansive in their quality and range, demonstrating his keen originality of thought, supported by insightful and comprehensive archival research. Haslam is the author of many books, as well as a blog, www.throughrussianeyes.com, which highlights aspects of Russia's foreign and defense policies that do not see the light of day in mainstream media.

Sabine Schmidtke

Professor · Islamic Intellectual History

Sabine Schmidtke is a scholar of Islamic intellectual history whose research has transformed perspectives about the interrelations and connections among different strands of intellectual inquiry, across time, place, religions, and philosophical schools. Schmidtke is currently working on the history of Islamic thought in the postclassical period (thirteenth to nineteenth century) with a focus on reconstructing the textual heritage and the intellectual import of the Islamic intellectual world, from Iran and Central Asia to Turkey and Spain. She is also engaged in a comprehensive study of the Muslim reception of the Bible, a topic on which she has published extensively.



Glen W. Bowersock

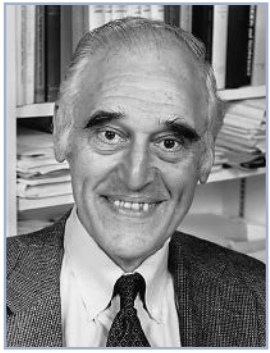
Professor Emeritus · Ancient History

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 in its social context. She is currently working on the significance of religious objects in women's monastic houses in Germany before and after the Protestant Reformation and on theoretical questions concerning the agency of objects.



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, the 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, the history of Cluny, and the fourteenth-century crusading propagandist William of Adam. A work on the California Gold Rush appeared in 2015. He is at work on a short book on early medieval monasticism.

Christian Habicht

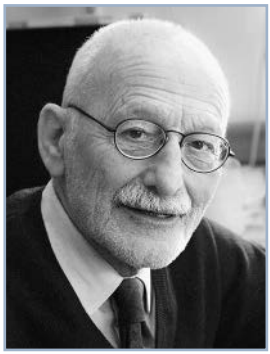
Professor Emeritus · Ancient History

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; six volumes were published in 2010–12. An updated English edition of his doctoral dissertation, submitted in German in 1951, was published as "Divine Honors for Mortal Men in Greek Cities: The Early Cases" by Michigan Classical Press in 2017.

Jonathan Israel

Professor Emeritus · Modern European History

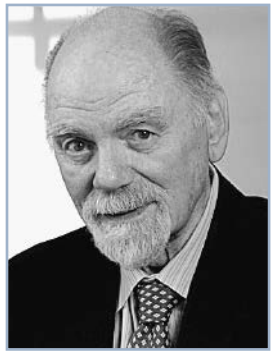
Jonathan Israel's work is concerned with European and colonial history from the Renaissance to the eighteenth century. His recent work focuses on the impact of radical thought (especially Spinoza, Bayle, Diderot, and eighteenth-century French materialists) on the Enlightenment and on the emergence of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



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. The first two volumes of a projected six-volume edition of his collected works have been published as *Visible Spirit: The Art of Gianlorenzo Bernini* (2007–09), while the third volume has appeared as *Bernini at St. Peters: The Pilgrimage* (2012). A gathering of his essays on modern art has appeared in Italian as *L'Arte della storia dell'arte* (2008). He also serves on the Italian Editorial Committee for a Complete Corpus of the Sculpture of Gianlorenzo Bernini.



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 books are *Myth and Modernity: Ernst Barlach's Drawings on the Nibelungen* (2012), written with Helga Thieme, which discusses a modern interpretation of a medieval myth as a document of German history in the 1920s and '30s, and *Clausewitz and His Time* (2014), essays in the cultural and intellectual history of thinking about war, an expanded version of which is currently being translated for publication in Germany in 2017.

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.

Abdulrahman al-Salmi

Early Islamic Theology and History · Ministry of Endowments and Religious Affairs, Oman · *s*

Patricia Crone Member

Abdulrahman al-Salmi is working on early Islamic sources. He is currently editing and studying Ibadi texts of the eighth and ninth centuries, with regard to their authenticity and contents, in an effort to advance understanding of early Islamic political and theological thought.

Hassan Farhang Ansari

Islamic Law and Theology · Institute for Advanced Study · *m*

Funding provided by Carnegie Corporation of New York

Hassan Ansari focuses on the study of Islamic theology, philosophy, law, and legal theory.

Celia Applegate

Music History · Vanderbilt University

Edward T. Cone Member in Music Studies

Celia Applegate will be writing chapters on the nineteenth and twentieth centuries for a book about music and the Germans. This work seeks to illuminate four centuries of musical development in German-speaking Europe, exploring how an art form, its practices and presumptions, became an essential part of the Germans' collective experience.

Ilias Arnaoutoglou

Ancient Greek Legal History · Academy of Athens · *s*

Funding provided by the Patrons' Endowment Fund

Ilias Arnaoutoglou's main interest concerns the study of legal institutions and their context in Greco-Roman antiquity. At IAS, he plans to explore the impact of legal changes in a city in transition, Athens between 322 and 265 B.C.E.

Nicholas Baker

Cultural History of Renaissance Italy · Macquarie University · *s*

Nicholas Baker is writing a cultural history of financial risk-taking in Renaissance Italy. His project analyzes the relationship between changing conceptions of time and the future, the meanings ascribed to the taking of chances on future outcomes, and the experiences of such risk-taking.

Elisheva Baumgarten

Medieval History · Hebrew University of Jerusalem
George William Cottrell, Jr. Member

Elisheva Baumgarten's project seeks to provide a new framework for thinking about the religious, social, and cultural experiences of marriage for the Jews of Germany, northern France, and England between 1100 and 1350. It situates the practices of these communities in relation to contemporaneous developments in medieval Christian society and in comparison with other Jewish diasporas.

Betsy Beasley

History of Capitalism and International Relations · Harvard University
AMIAS Member

At IAS, Betsy Beasley is completing a book manuscript on the making of a service empire. The book traces how Houston, Texas–based oil executives subverted the demands of two of the most significant political formations of the second half of the twentieth century: the U.S. labor movement and the international struggle for decolonization.

David Blackbourn

Modern German History · Vanderbilt University
Funding provided by The Andrew W. Mellon Foundation

David Blackbourn is working on a book about Germany in the world, 1500–2000, a transnational or global history for a global age. It will introduce readers to little-known movements, exchanges and transfers of people, things, and ideas, and reframe familiar episodes of German history from a new perspective.

Hartwin Brandt

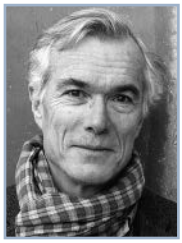
Ancient History · Otto-Friedrich-Universität Bamberg
Funding provided by the Herodotus Fund

Hartwin Brandt is working on life, death, and emotions in literature and inscriptions of the Roman Empire. He intends to analyze how and with which emotional codes concepts of life's journeys, records of life, exemplary lives, and successful lives were memorialized, communicated, and perceived. His project will consider inscriptions, historiographical and medical texts, letters and orations.

Stefan Brink

Medieval History · University of Aberdeen · *f*

Stefan Brink's work extends over a vast range of disciplines and topics, such as Scandinavian Languages, Etymology, Toponymy, Landscape Studies, Archaeology, Early Medieval Studies, Legal History, Orality, and the Christianization process. Currently, he is running an international project in which all the early laws of Scandinavia are being translated, commented upon, and published in a series.



Timothy Brook

Chinese History · The University of British Columbia
Agnes Gund and Daniel Shapiro Member

Timothy Brook is writing a narrative of China's relationships with the world since the thirteenth century via three registers: connections created through diplomacy, trade, and intellectual exchange; comparisons with developments of commercial and state practices elsewhere; and commonalities shaped by the global environment.

Fabienne Burkhalter

Ancient Greek History, Papyrology · Université Lille 3 · *f*
Funding provided by the Fund for Historical Studies

Fabienne Burkhalter is studying the identity and the powers of the Ptolemaic and Roman *dioiketai*, through an in-depth analysis of the papyrological and archaeological evidence, in order to get a better understanding of the economic and financiary policy of the Ptolemies and the reforms in the management of Egypt under Roman rule.

Guillaume Calafat

Early Modern Mediterranean Legal and Maritime History · Université Paris 1 Panthéon-Sorbonne
Funding provided by the Herodotus Fund

At IAS, Guillaume Calafat is working on a book project about the history of trans-regional Corsican families that were established in several port cities in Southern Europe and Ottoman North Africa (1550s–1650s). He plans to focus on their economic activities and networks through legal documents, notarial deeds, and diplomatic correspondence.

Catherine Clark

Modern European History and International Relations · Massachusetts Institute of Technology
The Andrew W. Mellon Foundation Fellowships for Assistant Professors

Catherine Clark is writing a history of the French fascination with the People's Republic of China since 1949. Her project explores how pictures (from photojournalism to film) produced the myth of France's privileged relationship with the PRC, while their global circulation forged a new picture of China for the twentieth century.

Kathleen Coleman

Latin Literature and Roman Social History · Harvard University
Elinor Lunder Founders' Circle Member

Kathleen Coleman is working on a book about a Roman child, the son of two former slaves, who died aged eleven years, five months, and twelve days, having delivered a 43-line extempore poem in Greek at an international competition in Rome in the presence of the emperor Domitian in 94 C.E.

Constance Cook

Ancient China · Lehigh University

Funding provided by the Hetty Goldman Membership Fund

Constance Cook's book project focuses on newly recovered B.C.E. Chinese texts and how they reflect the use of divination techniques to diagnosis and heal illness according to pre-Buddhist medical conceptions of the human body.

William Diebold

Art History · Reed College · *s*

William Diebold is a historian of early medieval art who is completing a book on the exhibition of medieval art in twentieth-century Germany in order to understand the modern interest in the Middle Ages.

John Eldevik

Medieval Social and Religious History · Hamilton College · *s*

At IAS, John Eldevik is working on the so-called "Letter of Prester John," a popular forgery of the Middle Ages that provides a fascinating window onto medieval attitudes towards history, geography, and theology, particularly when viewed in the context of other works with which it circulated in contemporary manuscripts.

Alison Games

Early Modern Global History · Georgetown University

Hans Kohn Member

Alison Games is writing a book about an incident known as the "Amboyna Massacre," which occurred in the Indian Ocean in 1623 and involved English, Dutch, and Japanese participants. The episode had repercussions around the globe and its legacies and memory endured in British culture for almost two centuries.

Valerie Garver

Early Medieval History · Northern Illinois University · *f*

Valerie Garver is writing a book on the meanings and uses of textiles in the Carolingian world, which reassesses that society through the lens of this form of material culture. Analysis of material remains, texts, and paintings reveals how textiles linked varied groups in ways otherwise invisible to modern scholars.

Sebastian Guenther

Classical Islam and Arabic Studies · Georg-August-Universität Göttingen
Willis F. Doney Member

Sebastian Guenther's research focuses on the intellectual heritage of the Arabic-Islamic world. His current book project analyzes pedagogical theories advanced by leading Muslim thinkers from the eighth to the fifteenth century C.E.

Cynthia Hahn

Medieval Art History · Hunter College, The City University of New York
Funding provided by the Fund for Historical Studies

Cynthia Hahn is a historian of medieval art that works on relics, especially their display and use. Her project at the Institute will focus on wearable reliquaries, amulets, texts, and images and their relationship to the body and personal practices of prayer, viewing, and imagination.

Omar Hamdan

The Arabic Bible · Eberhard Karls Universität Tübingen · *s*
Martin L. and Sarah F. Leibowitz Member

The impact of Saʿadyāh Gāʾōn's Arabic Pentateuch translation on medieval Muslim scholars has not yet been investigated. Moreover, this landmark effort still awaits a modern critical edition. The latter will be provided by considering important seventh/thirteenth century Arabic-Islamic manuscripts that clearly account for Muslim reception of Saʿadyāh's work.

Will Hanley

Legal History, Digital History · Florida State University · *f*
Elizabeth and J. Richardson Dilworth Fellow

"Names as Ontology" investigates rules governing how personal names and identifiers were employed in serial historical records of the modern Middle East. Using the semantic data model and pooling datasets, Will Hanley seeks to discover categories of identification encoded in the words that scribes and bureaucrats used to describe individuals.

Marta Hanson

Late Imperial China, History of Medicine · Johns Hopkins University
Elizabeth and J. Richardson Dilworth Fellow

Marta Hanson's book project focuses on how Chinese healers from antiquity to the mid-eighteenth century instrumentalized their bodies as mnemonic aids, calculating devices, and even medical instruments before medical instruments became external to physicians' bodies, calculators substituted for brains, and computers became surrogates for memory and minds in the modern period.

William Christopher Hedberg

Japanese Literature and Translation Studies · Arizona State University
The Andrew W. Mellon Foundation Fellowships for Assistant Professors

At IAS, William C. Hedberg is completing a study of Japanese engagement with late imperial Chinese fiction in the early modern era. This project is rooted in his interest in Sino-Japanese translation studies, premodern East Asian fiction criticism, and literary historiography.

Geoffrey Herman

History of Jews in Antiquity · The Hebrew University of Jerusalem · *s*
Funding provided by the Fund for Historical Studies

Geoffrey Herman is currently working on a book that examines the social, religious, and cultural experience of the inhabitants of one Sasanian province, Babylonia. Integrating the disparate contemporary narratives of Jews, Christians, Manicheans, and Zoroastrians, it will probe the sociocultural "koine" of the region, and the common modes of religious expression.

Cecily Hilsdale

Byzantine and Medieval Art · McGill University
Funding provided by the Fund for Historical Studies

Cecily Hilsdale studies the relationship between Byzantine and Western medieval art. Examining why certain images should look Byzantine outside of Byzantium, her current project traces how the Byzantine visual idiom came to signify the sovereignty associated with New Rome on the one hand and a style devoid of imperial associations on the other.

Minoru Inaba

Medieval History of Central Asia Between China and India · Kyoto University
Roger E. Covey Member in East Asian Studies

Minoru Inaba is interested in the historical frontiers of Central Asia, East Asia, and South Asia, as well as human activities across those frontiers. He is carrying out analysis of the travel records of Chinese Buddhist monks who visited India.

Adam Izdebski

Medieval Environmental History · Jagiellonian University in Krakow
Funding provided by the Herodotus Fund

Adam Izdebski is a historian of late antiquity and Byzantium, with strong interest in environmental history. He also works on social and religious history of late antiquity and on premodern Central Europe. His research aims to integrate scientific, archaeological, and textual evidence.

Kwangmin Kim

Late Imperial China · University of Colorado · *s*

Kwangmin Kim specializes in the history of empires, borderlands, and transnational relations in East Asia. At IAS, he will conduct research on the millenarian religions in China's borderlands, 1800 to 1900.

George Kiraz

Ottoman History of Religious Minorities, Syriac Studies · Beth Mardutho: The Syriac Institute

Funding provided by the Fund for Historical Studies

George Kiraz is working on Ottoman Garshuni documents from the Mardin Patriarchal Archive dating to the late nineteenth century. These are documentary petitions addressed to the Syriac Orthodox Patriarchs who resided in Deir al-Zaʿfarān (Monastery of the Saffaron).

Jamie Kreiner

Early Medieval History · University of Georgia

The Andrew W. Mellon Foundation Fellowships for Assistant Professors

Jamie Kreiner is working on a book that examines pigs as both objects and subjects in the early Middle Ages, to measure the impact that this species had on early medieval culture and to highlight the surprising ways that early medieval societies handled their lived environments.

Vladimir Kulić

Modern Architectural History · Florida Atlantic University · *f*

Funding provided by the Fund for Historical Studies

Vladimir Kulić is an architectural historian with an interest in architecture's encounters with geopolitics, socialism, and the cold war. At IAS, he is working on his next book, on Yugoslav architecture in the global cold war.

Eugenia Lean

History of Modern China · Columbia University

The Starr Foundation East Asian Studies Endowment Fund Member

Eugenia Lean's research examines how modern China has navigated global industrial capitalism. Whereas previous scholars have characterized Chinese men of letters as suspicious of global science, industry, and commerce, her book project will demonstrate how cultural entrepreneurs in early twentieth-century China leveraged their literary skills into industrial, chemical, and commercial success.

Polly Low

Ancient Greek History · The University of Manchester · *f*
Funding provided by the Herodotus Fund

Polly Low is a historian of classical Greece whose current research focuses on empire and imperialism in the Greek world: what mechanisms do Greek states use to enforce (or resist) the exercise of imperial or hegemonic power over others; how successful are those mechanisms; how did contemporary observers respond to them?

Weijing Lu

Chinese History · University of California, San Diego
The Starr Foundation East Asian Studies Endowment Fund Member

Weijing Lu is working on a book project that aims to deconstruct modern assumptions about arranged marriage. It examines ways of public representation and private expression of marital affection, as well as the tensions, strategies, and negotiations in conjugal relations in China's late imperial period.

Wilferd Madelung

Islamic Studies · University of Oxford · *v, s*

At IAS, Wilferd Madelung's joint research project together with Abdulrahman al-Salmi is working on critical editions of early Ibadi religious and historical texts dating from the first four centuries of Islam (seventh to tenth century C.E.). The Ibadiyya represent the moderate wing of one of the two large opposition movements to the predominant Sunni Islam.

Carolina Mangone

Renaissance and Baroque Art · Princeton University
The Andrew W. Mellon Foundation Fellowships for Assistant Professors

Carolina Mangone studies the strategies of imitation and reception by which Italian artists constructed their own art and identities. Her current project, on Michelangelo's sculptures, examines the precariousness and flexibility of the "non-finito" as an aesthetic category of early modern art.

Kevin Martin

Cultural History of Modern Syria · Indiana University
Willis F. Doney Member

Kevin Martin's project explores the reach of American "soft power" by analyzing Syrians' exposure to and perceptions of public diplomacy, propaganda, films, advertising, and new modes of urban leisure. Drawing upon an array of Syrian and American sources, he is analyzing cold war cultural exchange in an understudied setting.

Eduard Mühle

East European History · Westfälische Wilhelms-Universität Münster · *f*
Funding provided by The Gladys Krieble Delmas Foundation

Eduard Mühle is working on a new interpretation of "the Slavs." He aims to narrate their history from a double perspective: to show how "the Slavs" have been repeatedly designed as a cultural construct and used as a historical-political instrument and to describe the real historical structures to be found behind "the Slavs" in premodern times.

Alexander Nagel

Renaissance Art · New York University · *f*
William D. Loughlin Member; additional funding provided by the Patrons' Endowment Fund

Alexander Nagel has written books on Michelangelo and religious reform and more broadly on Italian art and the Reformation image debates. Long interested in the temporal life of works of art, his interests have recently turned to questions of spatial orientation and configurations of place in Renaissance art.

Carlos Noreña

Roman History · University of California, Berkeley · *s*

Carlos Noreña's project investigates the role of statutory law in structuring Roman imperialism during the Republic (ca. 250–30 B.C.E.), arguing that the conquest, conceptualization, and exploitation of overseas territories during this period were all propelled by a distinctively republican form of ordering the world, reflected in the legal apparatus of empire.

Marek Olbrycht

Ancient History, Archaeology, Iranian Studies · University of Rzeszów
Gerda Henkel Stiftung Member

Marek Olbrycht's research project examines how arms, armor, tactics, and strategy developed in the Arsacid Parthian empire while interacting with its neighbors to the west (Hellenistic kingdoms, Rome), north (Caucasia, Sarmatian peoples), and northeast (Central Asia). His aim is to reshape our understanding of the historical role played by the Parthian empire situated between Central Asia and the "classical" world of the Eastern Mediterranean.

Vladimir Pechatnov

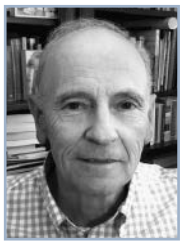
History of Soviet-American Relations · Moscow State Institute of International Relations · *f*
Funding provided by the Fund for Historical Studies

Vladimir Pechatnov is writing a book on George F. Kennan's visions of Russia, from his early studies of the Soviet experiment to analyzing its collapse and post-Soviet evolution. Kennan's analysis of the nature and prospects of the Soviet system in the context of Russian history remains the most creative part of his intellectual legacy.

Jörg Peltzer

Medieval Political, Social, and Legal History · Universität Heidelberg
John Rassweiler Founders' Circle Member

Jörg Peltzer's project at IAS is a comparative study of the formation and visualization of princely rank in England and the Empire in the thirteenth and fourteenth centuries.



David Gilman Romano

Classical Archaeology · The University of Arizona · *s*
Funding provided by The Andrew W. Mellon Foundation

David Gilman Romano is the Field Director of the Mt. Lykaion Excavation and Survey Project in Greece, working at the Sanctuary of Zeus, known in antiquity as the Arcadian "birthplace of Zeus." He is currently preparing final publications of the first five years of work at the site, writing articles on topography, geography, architecture, finds, and the stratigraphy of the upper and lower sanctuaries.

Erin Rowe

Religious Culture of the Early Modern Catholic World · Johns Hopkins University
Edwin C. and Elizabeth A. Whitehead Fellow

While at IAS, Erin Rowe is finishing a book manuscript that examines the circulation of devotion to black saints from the sixteenth to the eighteenth century. It argues that investigating the intersection of race and sanctity transforms our understanding of both.

Jonathan Sachs

Early Modern British Culture · Concordia University, Montreal

Jonathan Sachs is studying understandings of time in Europe ca. 1800 for a book on Romantic "slow time." It will consider temporal acceleration and slowness through the intersection of print media, commerce, and natural history to explore how "slow time" emerges as a new kind of temporal experience.

Jutta Schickore

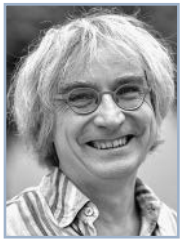
History of Science · Indiana University
Funding provided by the Fund for Historical Studies

Jutta Schickore's project investigates the yet unexplored histories of experimental control(s) and of working scientists' notions of causes, hypotheses, and complexity in the nineteenth and early twentieth centuries. It examines how experimenters conceptualized strategies for managing uncertain conditions and for dealing with hidden causes.

Konrad Schmid

Hebrew Bible · Universität Zürich · *f*

The Torah is the first text in the ancient world to develop the notion of divine laws. Konrad Schmid intends to elucidate the intellectual processes that led to the idea of God as lawgiver, drawing comparisons with other ancient Near Eastern legal systems, and to assess the impact of this notion on historical, social, and political contexts in ancient Israel and Judah.



Stefan Schorch

Samaritan Studies · Martin-Luther-Universität Halle-Wittenberg · *f*

Funding provided by the Patrons' Endowment Fund

Stefan Schorch is a Hebrew and Aramaic philologist specializing in the Hebrew Bible, Jewish literature of the Hellenistic and Roman period, and the literary heritage of the Samaritans. His present work focuses on Samaritan exegesis of the Torah from the second to fourteenth century C.E., as attested in Samaritan-Hebrew, -Aramaic, and -Arabic texts from that period.

Silvia Sebastiani

Early Modern History · École des Hautes Études en Sciences Sociales, Paris

Friends of the Institute for Advanced Study Member; additional funding provided by the Hetty Goldman Membership Fund

Silvia Sebastiani is currently developing a project on the boundaries of humanity. Her research focuses on entangled networks of animals, slaves, and material goods in the eighteenth century, exploring how they activated scientific, philosophical, political, and legal debates that reframed Enlightenment sciences of humanity.

Jonathan Unglaub

Renaissance and Baroque Art · Brandeis University

Felix Gilbert Member; additional funding provided by the Herodotus Fund

Jonathan Unglaub's book project investigates how pictorial illusionism in the Madonna images of Raphael and other masters—the implied transitivity of the intact picture plane—embodied the mystery of Mary as a bodily threshold at the incarnation and virgin birth.

Karina Urbach

Modern International Relations and Jewish Family History · University of London · *v*

Karina Urbach's new project investigates anti-Nazi intelligence operations during and after World War II.

Frederik Vervaet

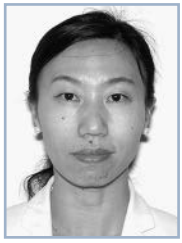
Roman History · The University of Melbourne · *s*

Frederik Vervaet is studying how Augustus, Rome's first Emperor, converted the public triumph from a shared ritual of the senatorial aristocracy into a strict monopoly of the imperial house. The ensuing book will suggest radical new directions in the way we conceive of the establishment and nature of the so-called Augustan Principate.

Rory Yeomans

Comparative European Fascism · Institute for Advanced Study · *s*
Willis F. Doney Member

Rory Yeomans's main research interest is in the comparative cultural, social, and economic history of European fascism, with an emphasis on Croatia under the Ustasha movement. His project at IAS is a study of transnational links between citizens of the wartime Ustasha state and the new Europe.



Ying Zhang

Early Modern China · The Ohio State University · *f*

Ying Zhang's research focuses on early modern Chinese politics, gender, and the history of Confucianism. Currently, she is working on a historical study of prison culture in Ming dynasty China (1368–1644), examining how Confucian practices shaped the institution of prison and the political, social, and intellectual meanings of imprisonment in that context.

School of Mathematics

Administrative Officer: Nicole Maldonado

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.

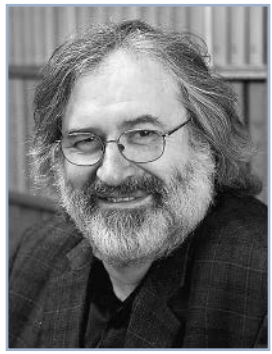
During the 2017–18 academic year, the School will have a special program on locally symmetric spaces and their analytical and topological aspects. Akshay Venkatesh of Stanford University will be the School's Distinguished Visiting Professor.

Other programs associated with the School are the 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

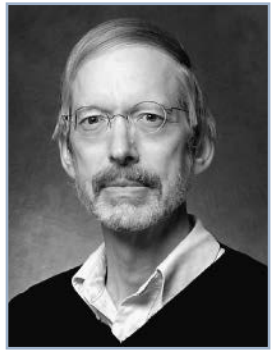
Jean Bourgain's work touches on many central topics of mathematical analysis: the geometry of Banach spaces, harmonic analysis, ergodic theory, spectral problems, and nonlinear partial differential equations from mathematical physics and combinatorial number theory. His contributions have solved longstanding problems in convexity theory and harmonic analysis such as Mahler's conjecture and the lambda-p set problem. His work has had important consequences in theoretical computer science, group expansion, spectral gaps, and the theory of 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.

Richard Taylor

Robert and Luisa Fernholz 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

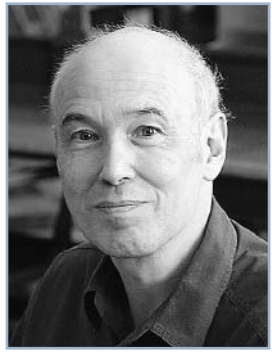
Herbert H. Maass Professor

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

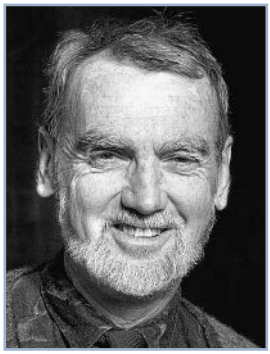
Professor Emeritus

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

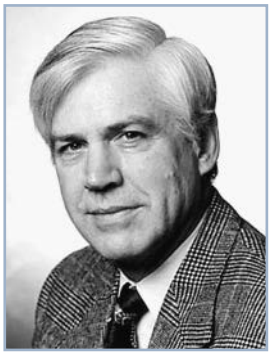
Phillip Griffiths initiated with his collaborators the theory of variation of Hodge structure, which has come to play a central role in many aspects of algebraic geometry and its uses in modern theoretical physics. In addition to algebraic geometry, he has made contributions to differential and integral geometry, geometric function theory, and the geometry of partial differential equations. A former Director of the Institute (1991–2003), Griffiths chaired 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 spent a good deal of time in the late eighties and nineties, and with some success, studying lattice models of statistical physics and the attendant conformal invariance. In recent years, he has been preoccupied by the geometric theory of automorphic forms. He has only now reached the stage at which he can contemplate publication.



Thomas Spencer

Professor Emeritus

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.

Emmanuel Abbe

Information Theory, Coding Theory, Learning Theory · Princeton University · *vnf, f*

Emmanuel Abbe's research interests are in information theory, coding theory, learning theory, and the mathematical aspects of these fields related to phase transitions, algorithms, and information-computation gaps. In particular, he is interested in spectral graph theory and embeddings.

Patrick Allen

Number Theory · University of Illinois at Urbana-Champaign · *v, f*

Funding provided by the National Science Foundation

Patrick Allen's research concerns the study of Galois representations and automorphic forms. At IAS, he intends to work on the connections between the cohomology of locally symmetric spaces, Galois representations and their deformation theory, and related Selmer groups.

Sanjeev Arora

Theoretical Computer Science, Machine Learning · Princeton University · *vp*

Funding provided by Eric and Wendy Schmidt

Sanjeev Arora is interested in achieving better theoretical understanding of methods in machine learning that are empirically successful, especially NP-complete problems that seem solvable in practice. Current topics of interest include unsupervised learning, generative models, deep learning, natural language processing, and reinforcement learning.

David Ben-Zvi

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

Funding provided by the National Science Foundation

At IAS, David Ben-Zvi is studying recent developments in geometric aspects of the Langlands program, as well as exploring connections of geometric representation theory with supersymmetric gauge theory.

Joseph Bernstein

Automorphic Representations · Tel Aviv University · *f*

Funding provided by the Charles Simonyi Endowment

Joseph Bernstein is working on analytic questions in the theory of automorphic forms. These include, first, meromorphic continuation of Eisenstein series and bounds for them and, second, automorphic periods, including subconvexity estimates for automorphic periods and global invariants obtained from them.

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

Irina Bobkova

Algebraic Topology, Homotopy · Institute for Advanced Study
Funding provided by the National Science Foundation

Irina Bobkova's research is in algebraic topology, specifically homotopy theory. Currently, she is working on several computational projects in chromatic and equivariant homotopy theory, using tools from algebraic geometry and representation theory.

Nathaniel Bottman

Symplectic Geometry · Institute for Advanced Study
Schmidt Fellow; supported by Eric and Wendy Schmidt

Nathaniel Bottman's research is in symplectic geometry, with a focus on notions of functoriality for Fukaya categories. At IAS, he intends to continue work on a new operad controlling operations among Fukaya categories and to investigate these operations as they relate to symplectic cohomology.

Farrell Brumley

Number Theory, Automorphic Forms, Representation Theory · Université Paris 13 · *s*
Funding provided by The Ambrose Monell Foundation

Farrell Brumley is interested in analytic aspects of automorphic forms and number theory. His current research centers on counting problems and eigenfunction estimates, often in relation to the trace formula.

Guillaume Brunerie

Homotopy Type Theory · Institute for Advanced Study
Funding provided by the Florence Gould Foundation Fund and the National Science Foundation

Guillaume Brunerie is working on homotopy theory in the setting of univalent foundations, using higher inductive types and the univalence axiom to state and prove theorems of homotopy theory. He is also interested in other aspects of homotopy type theory, such as cubical type theory and formalization in Agda.

Ashay Burungale

Number Theory, Modular Forms · Université Paris 13
Funding provided by the National Science Foundation

Ashay Burungale is studying modular forms, Shimura varieties, and zeta values.

Ana Caraiani

Number Theory · Institute for Advanced Study · *vnf, s*
AMIAS Member

Ana Caraiani is interested in the classical and p-adic Langlands programs and the geometry of Shimura varieties. In particular, she studies the Galois representations associated with automorphic forms using geometric techniques together with the trace formula. She also studies the connection between modularity lifting theorems and p-adic local Langlands.

Eshan Chattopadhyay

Theoretical Computer Science · Institute for Advanced Study
Funding provided by the Simons Foundation and the National Science Foundation

Eshan Chattopadhyay's research interests are in computational complexity theory, pseudorandomness, and cryptography.

Gao Chen

Calabi-Yau Manifolds · Institute for Advanced Study
Funding provided by the S. S. Chern Foundation for Mathematics Research Fund and the National Science Foundation

Gao Chen's main interest is in manifolds with special holonomies, including Calabi-Yau manifolds, hyper-Kähler manifolds, G_2 manifolds and Spin(7) manifolds. He also interested in the application in mathematical physics.

William Yun Chen

Number Theory, Arithmetic Geometry, Galois Theory · Institute for Advanced Study
Funding provided by the Ky Fan and Yu-Fen Fan Membership Fund and the National Science Foundation

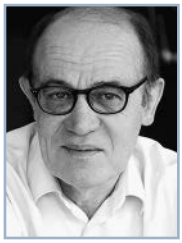
William Yun Chen studies moduli spaces of elliptic curves equipped with non-abelian level structures, which are often quotients of the upper half-plane by noncongruence subgroups of SL(2,Z). At IAS, he plans to further develop this theory and its applications to the arithmetic of noncongruence modular forms and the inverse Galois problem.

Otis Chodosh

Geometric Analysis · Institute for Advanced Study/Princeton University · *vri*
Funding provided by the National Science Foundation and the Oswald Veblen Fund

Otis Chodosh is interested in minimal surfaces, the isoperimetric problem, and geometric flows. He plans to continue to investigate the large-scale behavior of area in settings related to general relativity and low-dimensional topology.

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



Laurent Clozel

Automorphic Forms, Galois Representations · Université Paris-Sud 11 · *f*
Funding provided by the National Science Foundation

Laurent Clozel's research focuses on automorphic forms, Galois representations, and the trace formula.

Gil Cohen

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

Gil Cohen's interests lie mostly in theoretical computer science with a focus on computational complexity, pseudorandomness, and explicit constructions. He is fascinated by the role randomness plays in computation and mathematics and by its many applications to related branches such as cryptography, coding theory, quantum information theory, and combinatorics.

Nadav Cohen

Theoretical Machine Learning · Institute for Advanced Study
Funding provided by Eric and Wendy Schmidt

Nadav Cohen's research focuses on the theoretical and algorithmic foundations of deep learning. In particular, he is interested in the application of tensor analysis for the study of convolutional network architectures.

Pierre Colmez

Number Theory · Université Pierre et Marie Curie · *f*
Funding provided by the National Science Foundation

Pierre Colmez intends to continue his work on the p-adic local Langlands correspondence, and to see if it can be extended to other cases than the one known so far.

Yaim Cooper

Algebraic Geometry · Institute for Advanced Study · *v, f*

Yaim Cooper studies algebraic geometry, especially problems relating to enumerative geometry and Gromov-Witten theory.

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vri Veblen Research Instructorship · *vnf* von Neumann Fellowship

Gisella Croce

Implicit Partial Differential Equations · Institut Universitaire de Technologie du Havre · *v, s*

Gisella Croce is interested in partial differential equations and shape optimization. At IAS, she is working on quantitative isoperimetric inequalities and symmetry properties of minimizers of functionals arising from the calculus of variations.

Vesselin Dimitrov

Diophantine Approximation by Special Points, Applications to Dynamics, Geometry · Institute for Advanced Study

Funding provided by the Giorgio and Elena Petronio Fellowship Fund II and the National Science Foundation

Vesselin Dimitrov explores the structural aspects of Diophantine approximation by special points, such as CM points or algebraic points of theoretically minimal height in an arithmetic variety. He is interested in the connections of discrete amenable groups to the dynamics of algebraic actions, and in related questions in number theory and geometry.

Xiumin Du

Harmonic Analysis · Institute for Advanced Study

Shiing-Shen Chern Member; additional funding provided by the National Science Foundation

Xiumin Du is studying various topics in harmonic analysis, especially the Fourier restriction problem, Kakeya conjecture, Schrödinger maximal estimates, and decoupling.

Zeev Dvir

Computer Science · Princeton University · *vnf*

Zeev Dvir has a broad interest in theoretical computer science and mathematics and is especially interested in computational complexity, pseudorandomness, coding theory, and discrete mathematics.

Jessica Fintzen

Number Theory, Representation Theory · Institute for Advanced Study

Funding provided by the National Science Foundation

Jessica Fintzen is interested in number theory, representation theory, and their interplay. Most of her research projects concern the structure theory and representation theory of p-adic reductive groups, as well as their connection with Galois representation. She also plans to resume studying p-adic automorphic forms.

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

Ziyang Gao

Number Theory · Institute for Advanced Study · *v*

Ziyang Gao works on Diophantine problems with abelian varieties and mixed Shimura varieties. His recent research concerns transcendental results and unlikely intersections on mixed Shimura varieties using different techniques (algebraic group theory, Diophantine estimate, Hodge theory, o-minimal theory, and so on).

Jayce Getz

Number Theory · Duke University · *s*

Funding provided by the Charles Simonyi Endowment

Jayce Getz works on automorphic representation theory. At IAS, he is investigating interrelated proposals of Braverman-Kazhdan and Langlands for proving Langlands functoriality. He is also interested in developing a theory of relative endoscopy with a view toward relating algebraic cycles on Shimura varieties and period integrals on general linear groups.

Alexander Goncharov

Arithmetic Algebraic Geometry, Lie Groups · Yale University · *f*

Alexander Goncharov is interested in the study of quantum Hodge field theory, special values of L-functions, motivic Galois groups, scattering amplitudes, cluster varieties, representation theory, and moduli spaces.

Mark Goresky

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

Mark Goresky is studying the moduli space of abelian varieties with real structures and its finite field analogues.

Daniel R. Grayson

Univalent Foundations · University of Illinois at Urbana-Champaign · *v, s*

Daniel Grayson is working on computer formalization of some of the proofs of modern mathematics, using Vladimir Voevodsky's univalent foundations, a new foundation for mathematics based on homotopy type theory, in which the notion of "set" is no longer the most fundamental.

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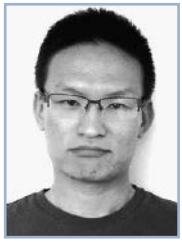
vri Veblen Research Instructorship · *vnf* von Neumann Fellowship

Heekyoung Hahn

Representation Theory Arising from Langlands Beyond Endoscopy Proposal · Duke University · *s*

Heekyoung Hahn works in number theory and automorphic forms. Langlands' beyond endoscopy proposal motivates the study of irreducible subgroups of GL(n) that stabilize a line in a given representation of GL(n). Her current research focuses on this study and related issues in algebraic combinatorics and explicit Satake inversion.



Rui Han

Mathematical Physics · Institute for Advanced Study

Funding provided by the National Science Foundation

Rui Han's current research concerns mathematical physics, particularly spectral theory of quasi-periodic Jacobi matrices. He is also interested in harmonic analysis and partial differential equations.

Kuen-Bang Hou

Mechanized Reasoning · Institute for Advanced Study

Funding provided by the National Science Foundation

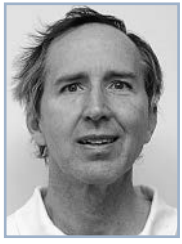
Mechanized reasoning has been developed to establish the correctness of computer programs or hardware design, and Kuen-Bang Hou believes it can provide a further guarantee of correctness for mathematical results. However, current tools seem inaccessible to most mathematicians, and he would like to improve these tools to remove potential technical obstacles.

June Huh

Algebraic Geometry, Combinatorics · Institute for Advanced Study · *vp*

Funding provided by the Ellentuck Fund and the National Science Foundation

June Huh applies tropical geometry and singularity theory to problems in combinatorics and other areas. His recent interests include singularities of projective hypersurfaces, positivity of Chern classes of Schubert varieties, and connections between realizability problems in algebraic geometry and combinatorial geometry.



John Imbrie

Mathematical Physics · University of Virginia · *s*

John Imbrie is working on mathematical problems in quantum and statistical physics. He is currently studying the properties of random matrices that arise in many-body quantum systems.

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

Ian Jauslin

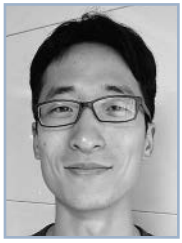
Mathematical Physics · Institute for Advanced Study
Funding provided by the National Science Foundation

Ian Jauslin's research focuses on the mathematical aspects of statistical mechanics and solid state physics. In particular, he is interested in phase transitions in classical and quantum many-particle systems, and in rigorous implementations of the renormalization group.

Ilya Khayutin

Number Theory, Dynamics · Institute for Advanced Study/Princeton University · *vri*
Schmidt Fellow; supported by Eric and Wendy Schmidt

Ilya Khayutin is interested in the interaction between arithmetic and dynamics, which often incorporates methods and ideas from homogeneous dynamics and ergodic theory, arithmetic geometry, and automorphic forms. Recently, he has been studying the distribution of toral periods.



Jongchon Kim

Harmonic Analysis · University of Wisconsin–Madison
Funding provided by the National Science Foundation

Jongchon Kim studies harmonic analysis and its interactions with partial differential equations and analytic number theory. At IAS, he intends to work on some problems in Fourier multipliers.

Ju-Lee Kim

Representation Theory of p-adic Groups · Massachusetts Institute of Technology
Funding provided by the National Science Foundation

Ju-Lee Kim is interested in representation theory and harmonic analysis on p-adic reductive groups.

Alex Kontorovich

Number Theory, Automorphic Forms · Rutgers, The State University of New Jersey · *vnf*
Funding provided by the National Science Foundation

Alex Kontorovich's research concerns problems at the intersection of number theory, geometry, dynamics, and representation theory. Specifically, he studies harmonic analysis on symmetric spaces to try to answer simple questions about whole numbers.

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

Clemens Koppensteiner

Geometric Representation Theory · Institute for Advanced Study
Funding provided by the Giorgio and Elena Petronio Fellowship Fund and the National Science Foundation

Clemens Koppensteiner is focusing on understanding structures of derived categories of sheaves in algebraic geometry, and in particular those of interest in geometric representation theory. Such structures include exotic and perverse-coherent t-structures, Hochschild cohomology, and support theories.

Pravesh Kothari

Theoretical Computer Science · Institute for Advanced Study/Princeton University
Funding provided by the National Science Foundation

Pravesh Kothari is interested in computational complexity theory, with a specific focus on approximation algorithms, hardness of approximation, and pseudorandomness. At IAS, he plans to continue his recent work on understanding the limitations of algorithmic schemes based on linear and semidefinite programming.

Erez M. Lapid

Automorphic Forms, Trace Formula · Weizmann Institute of Science · *s*
Funding provided by the Charles Simonyi Endowment

Erez M. Lapid is working on global and local aspects of Arthur's trace formula and representation theory of p-adic groups.

Bao V. Le Hung

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

Bao Le Hung is interested in the geometry of moduli spaces of Galois representations. These spaces appear to have many fascinating connections to diverse areas of mathematics such as geometric representation theory, modular representation theory, and automorphic forms, and are crucial to understanding Langlands reciprocity and its mod p and p-adic variants.

Marius Christopher Lemm

Mathematical Physics, Analysis · California Institute of Technology
Funding provided by the National Science Foundation

Marius Lemm works in analysis, especially the calculus of variations, geometric flows, and spectral theory. The problems he studies are often motivated by quantum many-body physics. He is also interested in entropy inequalities and quantum information theory.

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vri Veblen Research Instructorship · *vnf* von Neumann Fellowship

Francesco Lin

Low-Dimensional Topology, Differential Geometry · Institute for Advanced Study/Princeton University · *vri*

Francesco Lin studies differential equations coming from gauge theory and their applications to low-dimensional topology.

Michael Lipnowski

Number Theory, Automorphic Forms, Representation Theory · Institute for Advanced Study

Funding provided by the National Science Foundation

Michael Lipnowski's research is in number theory and related topics, especially problems that have interesting interactions with geometry and analysis.

Zheng Liu

Number Theory · Institute for Advanced Study

Funding provided by the National Science Foundation

Zheng Liu's research area is number theory, mainly focused around p-adic properties of automorphic forms, special L-values and Iwasawa theory. She is interested in establishing certain p-adic congruences among Siegel modular forms, which are connected with special L-values and can be used to construct classes in Selmer groups.

Aleksandr Logunov

Nodal Geometry of Laplace Eigenfunctions · Institute for Advanced Study

Schmidt Fellow; supported by Eric and Wendy Schmidt

Aleksandr Logunov's research interests cover potential theory, partial differential equation, and complex and harmonic analysis. His current research focuses on the geometry of the zero sets of Laplace eigenfunctions.

Maryanthe Malliaris

Model Theory (Logic) · The University of Chicago · *vnf, s*

Minerva Research Foundation Member

Maryanthe Malliaris's research interests are in model theory, especially classification of theories. Her recent research builds a framework for comparing the complexity of theories via ultrapowers, a special kind of limit structure. There are connections to the study of complexity in finite combinatorics, set theory, and general topology and to the study of very large graphs.

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vri Veblen Research Instructorship · *vnf* von Neumann Fellowship

Simon Lindsay Marshall

Number Theory · University of Wisconsin–Madison
Neil Chriss and Natasha Herron Chriss Founders' Circle Member

Simon Lindsay Marshall studies harmonic analysis, automorphic forms, and the cohomology of arithmetic manifolds. At IAS, he intends to work on the subconvexity problem for L-functions by combining semiclassical analysis with period integral formulae.

David W. Masser

Number Theory · Mathematisches Institut der Universität Basel · *v, f*
Funding provided by the Charles Simonyi Endowment

David Masser works mainly on transcendental number theory, Diophantine approximation, and Diophantine geometry, especially applying the techniques of the first and second areas to the third. In the last few years, he has focused on certain finiteness results obtained through height bounds, with unexpected consequences for Pell's equation and elementary integration.

Svitlana Mayboroda

Analysis, Partial Differential Equations · University of Minnesota · *vnf, s*
Funding provided by the National Science Foundation

Svitlana Mayboroda is working on harmonic analysis, partial differential equations, and geometric measure theory. At IAS, she plans to concentrate on certain aspects of wave localization in rough media.

James Maynard

Prime Gaps · Institute for Advanced Study · *f*
Funding provided by the National Science Foundation

James Maynard works in analytic number theory, particularly on sieve methods and the distribution of prime numbers. In his work, he typically tries to use tools from analysis, probability, and algebra to extend the current methods for showing the existence of prime numbers in different sets, or to apply such methods to better understand the distribution of primes.

Han-Bom Moon

Birational Algebraic Geometry of Moduli Spaces · Fordham University
Minerva Research Foundation Member

Han-Bom Moon is working on geometry and topology of various moduli spaces and birational geometry of moduli spaces in a viewpoint of Mori's program. While at IAS, he intends to work on the combinatorial approach on birational geometry of moduli spaces of rational curves.

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vri Veblen Research Instructorship · *vnf* von Neumann Fellowship

Shay Moran

Machine Learning · University of California, San Diego
Funding provided by the Simons Foundation and the National Science Foundation

Shay Moran's interests lie in the spectrum between mathematics and computer science, including combinatorics, geometry, information theory, machine learning, statistics, and complexity theory.

Vidit Nanda

Algebraic Topology · University of Oxford
Friends of the Institute for Advanced Study Member

Vidit Nanda is an applied and computational algebraic topologist. His work has focused on discrete Morse-theoretic algorithms for computing (co)homology groups of large cell complexes.

Assaf Naor

Analysis, Metric Embeddings, Approximation Algorithms · Princeton University
Funding provided by the National Science Foundation

Assaf Naor is a mathematician who studies analysis and metric geometry. He is also interested in the interaction of these areas with theoretical computer science. At IAS, he intends to work on the Lipschitz extension problem, metric embeddings, harmonic analysis, and their connections to approximation algorithms.

Amitai Netser Zernik

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

Amitai Netser Zernik is interested in fixed-point expressions for open Gromov-Witten theory, and in using such expressions to shed light on homological mirror symmetry.

Behnam Neyshabur

Optimization, Generalization in Deep Learning · Institute for Advanced Study
Funding provided by Eric and Wendy Schmidt

Behnam Neyshabur is interested in understanding general rules that govern learning in humans, animals, or machines. His research area is machine learning, with a focus on optimization and generalization in deep learning models.

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vri Veblen Research Instructorship · *vnf* von Neumann Fellowship

Wieslawa Niziol

Arithmetic Algebraic Geometry · CNRS, École Normale Supérieure de Lyon · *f*

Funding provided by the Charles Simonyi Endowment

Wieslawa Niziol works on p-adic cohomologies of p-adic symmetric spaces, particularly their p-adic étale cohomologies that have rich representation theoretical structures. They can be understood via comparison theorems with other cohomologies.

Greta Panova

Algebraic Combinatorics · University of Pennsylvania · *vnf*

Greta Panova works on applications within computational complexity (geometric complexity theory), statistical mechanics (integrable systems), and probability.

Lillian B. Pierce

Analytic Number Theory · Duke University · *vnf*

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

Lillian Pierce studies the intersection between harmonic analysis and analytic number theory. At IAS, she is focusing on subconvexity estimates for automorphic forms.

Toniann Pitassi

Computational Complexity, Proof Theory · University of Toronto · *vp, f*

Funding provided by the National Science Foundation

Toniann Pitassi's research area is complexity theory: understanding the limitations of computation, specializing in circuit complexity, proof complexity, and communication complexity. She is also interested in mathematical models for privacy-preserving computation and non-discriminatory machine learning.

Aaron Pollack

Number Theory, Automorphic Forms on Exceptional Groups · Institute for Advanced Study

Schmidt Fellow; supported by Eric and Wendy Schmidt

Aaron Pollack's research concerns the L-functions of automorphic forms.

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vri Veblen Research Instructorship · *vnf* von Neumann Fellowship

Anantharam Raghuram

Cohomology of Arithmetic Groups, Special Values of Automorphic L-functions · Indian Institute of Science Education and Research · *s*

Funding provided by the Charles Simonyi Endowment

Anantharam Raghuram's work concerns the special values of L-functions. He studies the arithmetic properties of various automorphic L-functions using the cohomology of arithmetic groups. This involves giving a cohomological interpretation to some analytic theory of L-functions. He is especially interested in Eisenstein cohomology and various Langlands-Shahidi L-functions.

Andrei S. Rapinchuk

Algebraic Groups, Zariski-dense Subgroups, Locally Symmetric Spaces · University of Virginia · *s*

Andrei Rapinchuk is interested in structural and arithmetic properties of linear algebraic groups over global as well as general fields. He investigates arithmetic and general Zariski-dense subgroups of algebraic groups and applies the results to locally symmetric spaces.

Arash Rastegar

Number Theory, Algebraic Geometry · Sharif University of Technology, Tehran

Funding provided by the National Science Foundation

Arash Rastegar is interested in modular forms, Diophantine geometry, self-similarity in arithmetic geometry, and deformations of algebras and their representations. He has also produced work in the areas of philosophy of mathematics, philosophy of science, anthropology, and education. His research at IAS will focus on number theory and algebraic geometry.

Andre Reznikov

Representation Theory, Automorphic Functions, Number Theory · Bar-Ilan University · *f*

Funding provided by the National Science Foundation

Andre Reznikov is studying periods of automorphic representations.

Yiannis Sakellaridis

Automorphic Forms, Representation Theory, Number Theory · Rutgers, The State University of New Jersey · *vnf, f*

Funding provided by the Charles Simonyi Endowment

Yiannis Sakellaridis is interested in automorphic forms, number theory, and representation theory. At IAS, he is focusing on relative trace formulas, which are ways to encode and organize L-functions, particularly novel relations between them, which amount to instances of Langlands functoriality conjecture and its "relative" variants.

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vri Veblen Research Instructorship · *vnf* von Neumann Fellowship

Wilhelm Schlag

Harmonic Analysis, Dispersive Evolution Equations · The University of Chicago · *vp*

Wilhelm Schlag studies spectral properties of Schrodinger operators with potentials defined by an ergodic process, such as shifts on tori. This is the wider area of Anderson localization. He also works on understanding the long-term behavior of solutions to nonlinear dispersive equations, such as focusing nonlinear wave equations. Methods of dynamical systems, mainly invariant manifold theory come into playin this analysis.

Matthias Schwarz

Symplectic Geometry, Hamiltonian Dynamics · Universität Leipzig

Funding provided by the National Science Foundation

Matthias Schwarz's research at IAS deals with phenomena of symplectic rigidity in the context of Hamiltonian dynamical systems. He is studying questions about dynamical properties such as recurrence with methods from symplectic rigidity, such as Floer theory and pseudo-holomorphic curves.

Joachim Schwermer

Arithmetic of Algebraic Groups, Geometry of Related Locally Symmetric Spaces · Universität Wien · *f*

Funding provided by the Charles Simonyi Endowment

Joachim Schwermer studies arithmetic of algebraic groups, automorphic forms and L-functions, and geometry of arithmetic varieties.

Paul Seidel

Mirror Symmetry · Massachusetts Institute of Technology

Paul Seidel works on structures relevant to homological mirror symmetry, especially Floer cohomology, with applications to symplectic topology. At IAS, he plans to study Gauss-Manin connections and their relatives.

Romyar Sharifi

Algebraic Geometry · University of California, Los Angeles · *s*

Funding provided by the National Science Foundation

Romyar Sharifi will focus on study of the arithmetic of Galois representations through the geometry and topology of higher-dimensional locally symmetric spaces. The prototypical example of this is a conjectural link between Steinberg symbols of cyclotomic units and modular symbols in the homology of modular curves modulo an Eisenstein ideal.

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Srimathy Srinivasan

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

Srimathy Srinivasan's research interests are mainly in algebraic geometry. Currently, her work revolves around motives, algebraic groups, projective homogeneous varieties, quadratic forms, and coding theory. In particular, she studies the motivic decomposition of projective pseudo-homogeneous varieties, which are a generalization of projective homogeneous varieties that occur over fields of non-zero characteristic.

Noah Stephens-Davidowitz

Computer Science Lattices, Cryptography · Institute for Advanced Study · *v*

Noah Stephens-Davidowitz's research has focused on the geometry of high-dimensional lattices and the complexity of related computational problems. He is also interested in theoretical computer science and geometry more broadly.

Sara Tukachinsky

Symplectic Geometry, Open Gromov-Witten Theory · Institute for Advanced Study · *f*
Funding provided by the National Science Foundation

Sara Tukachinsky is interested in open Gromov-Witten invariants and related structures.

Karen Uhlenbeck

Gauge Theory · The University of Texas at Austin · *v*

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

Dmitry Vaintrob

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

The coherent-constructible correspondence for toric varieties relates the derived category of coherent sheaves on a toric variety to a certain category of equivariant constructible sheaves with respect to a lattice. This is a part of a mirror symmetry story for toric varieties. Dmitry Vaintrob is interested in non-abelian versions of this result, with the lattice replaced by a noncommutative group.

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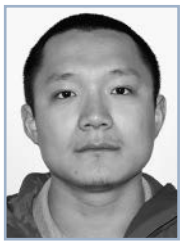
vri Veblen Research Instructorship · *vnf* von Neumann Fellowship

Akshay Venkatesh

Number Theory · Stanford University · *dvp*
Infosys Member

Akshay Venkatesh works on number theory and related fields. One focus of his recent research has been trying to understand how mixed motives interact with the Langlands program.



Chen Wan

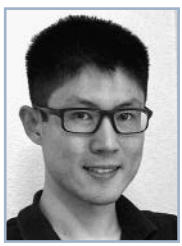
Automorphic Forms, Representation Theory, Trace Formula · Institute for Advanced Study
Funding provided by the National Science Foundation

Chen Wan's research areas include automorphic forms, representation theory, trace formula, and L-functions. He is particularly interested in incorporating the trace formula and the theory of spherical varieties into the study of multiplicities, functoriality, period integrals, and L-functions.

Jonathan Peiyu Wang

Representation Theory, Langlands Program · Institute for Advanced Study
Funding provided by the National Science Foundation

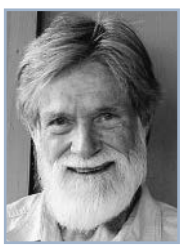
Jonathan Peiyu Wang is studying harmonic analysis on spherical varieties using quasimap spaces similar to those defined by Gaitsgory and Nadler. He is also interested in the spectral decomposition of the invariant Arthur-Selberg trace formula and generalizations to the relative trace formula.



Sida Wang

Machine Learning, Natural Language Processing · Institute for Advanced Study · *v*

Sida Wang is broadly interested in machine learning and natural language processing. Specifically, he wants computers to better understand human language and uses interactive machine learning to build language interfaces that accommodate both the precise computer action space and informal human thinking.



Robert F. Williams

Topology, Dynamical Systems · The University of Texas at Austin · *v*

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

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vri Veblen Research Instructorship · *vnf* von Neumann Fellowship

Helen Wong

Quantum Topology, Applications of Topology · Carleton University · *vnf*
Funding provided by The Ambrose Monell Foundation

Helen Wong's research is in low-dimensional quantum topology, and applications of topology to molecular biology and quantum computation. She is particularly interested in the relationship between quantum invariants and related constructions (especially the Kauffman bracket skein algebra of a surface) and non-quantum invariants from topology and hyperbolic geometry.

Dingyu Yang

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

Dingyu Yang is interested in constructing symplectic invariants from moduli of holomorphic curves, with emphasis on transversality and chain level structures. Abstractly, he is working on continuous polyfold theory and Fredholm homology, single value perturbation of Kuranishi structures and category. In applications, he is working on relative Symplectic Field Theory incorporating string topology (co)product/(co) bracket and open Fan-Jarvis-Ruan-Witten singularity theory.

Fan Yang

Mathematical Physics, Analysis · Institute for Advanced Study · *v*
Funding provided by the National Science Foundation

Fan Yang is interested in spectral theory of quasi-periodic Schrödinger operators. Her other research interests include analysis and fractal geometry.

Richard Zemel

Machine Learning · University of Toronto · *v, f*

Richard Zemel's work will focus on three machine learning topics, including learning with little data: how to adapt learning systems to accommodate new classes not seen in training, given only a few examples of each of these classes; fairness: how automated learning systems can make fair decisions, i.e., ones that are not unduly biased for or against specific subgroups in the population; and computational neuroscience: synergies between our understanding of neural information processing and computation in deep neural networks.

Ruixiang Zhang

Harmonic Analysis on Euclidean Spaces, General Locally Symmetric Spaces · Institute for Advanced Study
Funding provided by the National Science Foundation and the James D. Wolfensohn Fund

Ruixiang Zhang studies harmonic analysis problems on Euclidean spaces and locally symmetric spaces. He is particularly interested in the truncation operator defined by Langlands and Arthur and its application in the study of Eisenstein series and the trace formula, as well as Euclidean restriction and Kakeya-type problems.

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vri Veblen Research Instructorship · *vnf* von Neumann Fellowship

Rong Zhou

Geometry of Shimura Varieties · Institute for Advanced Study

Funding provided by the National Science Foundation

Rong Zhou's research interests are in arithmetic geometry, number theory, and representation theory. In particular, he is interested in questions related to the mod-p geometry of Shimura varieties and their applications to the Langlands program.

Michal Zydor

Automorphic Forms · Institute for Advanced Study

Funding provided by The Bell Companies Fellowship Fund and the National Science Foundation

Michal Zydor is interested in automorphic forms. In particular, he works on applying trace formula methods to questions relating to period integrals, functoriality, and special values of automorphic L-functions.

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School of Natural Sciences

Administrative Officer: Michelle Sage

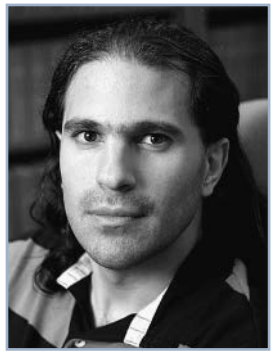
Executive Director and Administrator
The Simons Center for Systems Biology: Suzanne P. Christen

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

From its earliest days, the Institute has been a leading center for fundamental physics, contributing substantially to many of its central themes, which now interrelate with mathematics, astrophysics, and biology. Members in the astrophysics research group employ an array of tools from theoretical physics, large-scale computer simulations, and ground- and space-based observational studies to investigate the origin and composition of the universe, and to use the universe as a laboratory to study fundamental physics. At the Simons Center for Systems Biology, established in the School in 2004, the tools of modern physics and mathematics are being applied to biological investigation. This collaborative and pioneering approach to the sciences, which extends to the Institute's School of Mathematics, Princeton University, The Rockefeller University, and the larger scientific community, has transformed research in these fields and presents opportunities for powerful and important discoveries.

Areas of current interest in theoretical physics include elementary particle physics, particle phenomenology, string theory, quantum theory, and quantum gravity, and their relationship to geometry, theoretical and observational astrophysics, and cosmology. The astrophysics group combines theory with modern observational studies to understand a wide variety of astrophysical phenomena, from nearby planets to distant galaxies, from black holes to the dark matter and dark energy that dominate the evolution of the universe. The Simons Center conducts research at the interface of biology and the physical sciences, developing theoretical and experimental methods necessary for studying the collective behavior of biomolecules, cells, and organisms, exploring how individual components can give rise to complex, collective phenomena, and in some cases focusing on understanding disease processes.

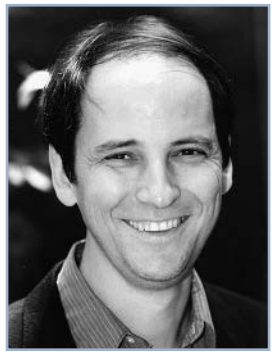
The School also sponsors Prospects in Theoretical Physics, a two-week residential summer program held at the Institute for promising graduate students and postdoctoral scholars, who attend lectures and sessions on the latest advances and open questions in the field of theoretical physics.



Nima Arkani-Hamed

Professor · Particle Physics

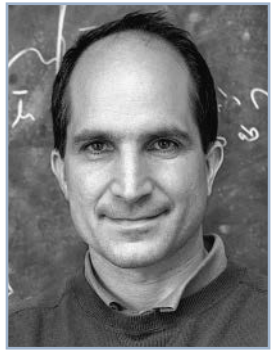
One of the leading particle physics phenomenologists of his generation, Nima Arkani-Hamed is concerned with the relation between theory and experiment. His research has shown how the extreme weakness of gravity, relative to other forces of nature, might be explained by the existence of extra dimensions 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.



Stanislas Leibler

Professor · Biology

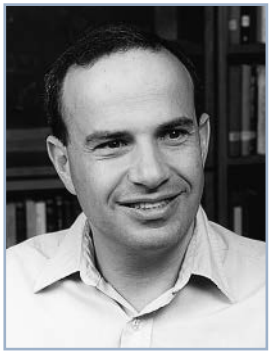
Stanislas Leibler has made contributions to theoretical and experimental biology, extending the interface between physics and biology to develop new solutions and approaches to problems. Interested in the quantitative description of microbial systems, both on cellular and population levels, Leibler is 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

Carl P. Feinberg 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

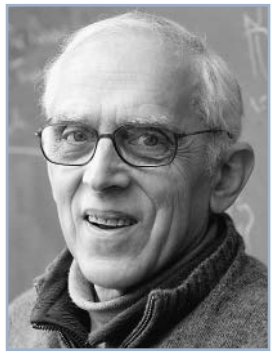
Charles Simonyi Professor · Mathematical Physics

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

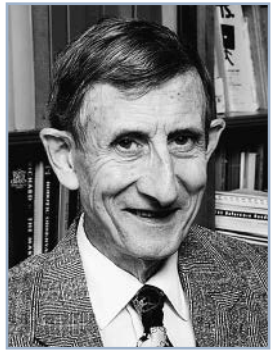
Matias Zaldarriaga has made many influential and creative contributions to our understanding of the early universe, particle astrophysics, and cosmology as a probe of fundamental physics. Much of his work centers on understanding the clues about the earliest moments of our universe encoded in the cosmic 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

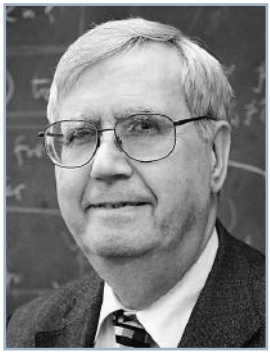
In a series of remarkable, difficult calculations, Stephen Adler demonstrated that abstract ideas about the symmetries of fundamental interactions could be made to yield concrete predictions. The successful verification of these predictions was a vital step toward the modern Standard Model of particle physics. In more recent work, he has been exploring generalized forms of quantum mechanics, both from a theoretical and a phenomenological standpoint. He has developed new algorithms for multidimensional numerical integration, and is currently exploring a particle unification model based on boson-fermion balance without full supersymmetry, and a novel proposal for the "dark energy" that drives the accelerated expansion of the universe.



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. In recent years he has been a regular contributor to the *New York Review of Books*, reviewing books about science and the history of science for the general public.



Peter Goddard

Professor Emeritus · 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 consistency, 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.

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.

Ahmed Almheiri

Quantum Field Theory · Institute for Advanced Study

Ahmed Almheiri is interested in understanding the connections between quantum information theory, quantum field theory, and quantum gravity. He previously worked on formulating the black hole firewall paradox and recasting AdS/CFT as a quantum error-correcting code. He is currently working on understanding what happens inside black holes.

Valentin Assassi

Astrophysics · Institute for Advanced Study

Martin A. and Helen Chooljian Founders' Circle Member

Valentin Assassi's research focuses on the physics of inflation and its implication for cosmological observations today. He is also interested in the large-scale structure of the universe and using the principles of effective field theory to describe structure formation on large scales.

Ben Bar-Or

Astrophysics · Institute for Advanced Study

Schmidt Fellow; supported by Eric and Wendy Schmidt

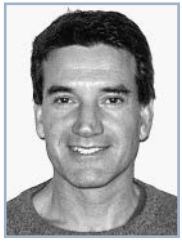
Ben Bar-Or is interested in the statistical mechanics of stellar systems, particularly in the context of Keplerian systems such as nuclear star clusters and planetary systems.

J. Richard Bond

Astrophysics, Cosmology · Canadian Institute for Theoretical Astrophysics, University of Toronto · *s*

Funding provided by the Raymond and Beverly Sackler Foundation Fund

J. Richard Bond is interested in physics of the early universe, the origin and evolution of cosmic structure, cosmic radiation backgrounds, dark matter and dark energy, and particle and gravitational theory.



Horacio Casini

Quantum Field Theory · Centro Atómico Bariloche, Argentina · *v, f*

Horacio Casini is very interested in the interplay between quantum information theory, quantum field theory, and gravity. Recently, he has been working in entanglement entropy in quantum field theory and applications to AdS-CFT (holographic entanglement entropy) and the c-theorems.

Susan E. Clark

Astrophysics · Institute for Advanced Study
Space Telescope Science Institute Hubble Fellow

Susan Clark studies astrophysical magnetic fields. Her current research focuses on magnetohydrodynamic instabilities, the magnetic interstellar medium, and polarized CMB foregrounds.

Matthew Coleman

Astrophysics · Institute for Advanced Study
Funding provided by the National Science Foundation and NASA

Matthew Coleman studies accretion in astrophysical systems. His work focuses on accreting white dwarfs, in particular Dwarf novae and AM CVn–type systems. Ionization instabilities arising from within these accretion disks lead to observable outbursts, providing an excellent means of confronting accretion disk theory with observations.

Clay Cordova

Theoretical Physics · Institute for Advanced Study · *m*
Marvin L. Goldberger Member; additional funding provided by the U.S. Department of Energy

Clay Cordova works on quantum field theory and mathematical physics, with connections to related topics in string theory and geometry. His current focus is supersymmetric field theories in diverse dimensions.

Bartlomiej Stanislaw Czech

Theoretical Physics · Stanford University
Funding provided by the National Science Foundation

Bartek Czech wants to understand how the fabric of space and time emerges from pre-geometric, fundamental degrees of freedom. In working toward that goal, he uses a broad set of tools, including holographic duality, aspects of information theory, tensor networks, and others.

Liang Dai

Cosmology · Institute for Advanced Study
NASA Einstein Fellowship Program

Liang Dai studies the phenomenology of the large-scale structure of the universe and the various cosmic objects it consists of, and the inferences they can yield about the physics of the very early universe. The focus of his recent research includes modeling and quantification of the nonlinear dynamics of the large-scale structure, gravitational lensing, and possible probes of gravitational waves.

f First Term · *s* Second Term · *m* Long-term Member · *v* Visitor
dvp Distinguished Visiting Professor · *jvp* Junior Visiting Professor · *ra* Research Associate

Michael Dine

Theoretical Particle Physics · University of California, Santa Cruz · *s*
Funding provided by the National Science Foundation

At IAS, Michael Dine anticipates working on questions of inflationary cosmology and the physics of the Large Hadron Collider. He also expects to explore issues in quantum field theory and string theory.

Jean-Baptiste Fouvry

Astrophysics · Institute for Advanced Study
Space Telescope Science Institute Hubble Fellow

Jean-Baptiste Fouvry's research focuses on the secular evolution of self-gravitating systems over cosmic age. He is interested in the kinetic theory of long-range interacting systems, from galactic discs to Keplerian systems.

Yvonne Geyer

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

Yvonne Geyer is working on theoretical high-energy physics, and in particular scattering amplitudes in gauge theory and gravity. Recently, her work has focused on their mathematical structures, and more specifically on twistor and ambitwistor strings.

Vera Gluscevic

Cosmology, Astrophysics · Institute for Advanced Study
Schmidt Fellow; supported by Eric and Wendy Schmidt

Vera Gluscevic's research focuses on using the cosmic microwave background to test physical theories, including those invoked to explain dark energy and inflation. She is also investigating a range of other topics, such as the direct detection of dark matter, probes of reionization, and the origins of magnetic fields in the universe.

Guy Gur-Ari

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

Guy Gur-Ari is interested in quantum field theory, quantum gravity, and black hole physics. He recently studied the origin of discrete energy levels in black hole systems, by employing tools such as holographic duality, chaos, and random matrix theory.

Adrian Hamers

Astrophysics · Institute for Advanced Study
The Peter Svennilson Membership

Adrian Hamers is interested in gravitational dynamics, and theoretical and computational astrophysics in general. He is working on the long-term evolution of hierarchical systems, such as multiplanet and multistar systems, and galactic nuclei. Applications include hot Jupiters, compact objects, SNe Ia, tidal disruptions, and gravitational wave sources.

James Colin Hill

Cosmology · Institute for Advanced Study and Columbia University
Friends of the Institute for Advanced Study Member

James Colin Hill works in physical cosmology, focusing primarily on the cosmic microwave background. His research aims to develop new methods to extract fundamental cosmological information from modern CMB surveys, including novel foreground mitigation strategies. He is interested in all aspects of cosmology, from galaxy formation to the very early universe.

Anna Karlsson

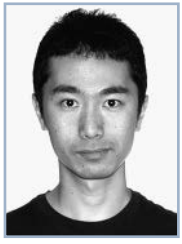
Theoretical Physics · Institute for Advanced Study
Funding provided by the Swedish Research Council

Anna Karlsson is interested in quantum gravity, effective models of quantum critical metals, and the interface between the two. She also works on supergravity amplitudes.

Alexander A. Kaurov

Astrophysics, Cosmology · Institute for Advanced Study
Schmidt Fellow; supported by Eric and Wendy Schmidt

Alexander Kaurov's research interests range from the physics of neutron stars to the epoch of reionization. At IAS, he is working on developing theoretical models of reionization and investigating techniques for analyzing the data from the upcoming probes of the early universe.



Shota Komatsu

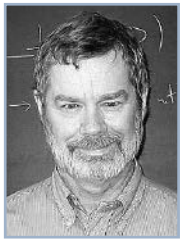
Quantum Field Theory · Institute for Advanced Study
Funding provided by the U.S. Department of Energy

Shota Komatsu is working on quantum field theory and string theory. Most of his research so far focuses on developing techniques to solve the prototypical example of the AdS/CFT duality, N=4 SYM. He plans to use these techniques, along with other methods such as conformal bootstrap, to gain deeper insight into quantum gravity and holography.

Dmitry Krotov

Biology · Institute for Advanced Study · *ra*

Dmitry Krotov is a physicist studying various problems in theoretical and computational biology. The central theme that runs through his research is the impact of microscopic noise on the collective properties of biological systems at the network level. He is interested in both purely theoretical problems and data-motivated questions.



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.

Doug Lin

Astronomy, Astrophysics · Lick Observatory · *f*
IBM Einstein Fellow

Doug Lin is interested in the theory of planetary formation and evolution. Currently, he is exploring new ideas to account for the ubiquity of planets and the diversity of planetary systems.

Jennifer Lin

Particle Physics · Institute for Advanced Study
William D. Loughlin Member; additional funding provided by the U.S. Department of Energy

Jennifer Lin is interested in quantum field theory, string theory, and quantum gravity. Recently, she has been studying quantum entanglement and its implications for gauge/gravity duality. She is also interested in supersymmetric gauge theory.

Matthew Low

Particle Physics · Institute for Advanced Study
Funding provided by the U.S. Department of Energy

Matthew Low works on various topics within particle physics, including collider physics, dark matter, and supersymmetry. His research interests center on understanding the physics at the weak scale via the Large Hadron Collider, but also extend to general properties of quantum field theories.

Raghu Mahajan

Quantum Field Theory · Princeton University · *v*

Raghu Mahajan's research focuses on techniques for strongly-interacting field theories, with a view toward dynamics, holography, and quantum gravity. Particular interests include transport in strongly-interacting metals, non-equilibrium dynamics, and questions relating to behind the horizon physics in black-holes. He is also interested in exploring the formal properties of conformal field theories using the bootstrap approach.

Ryan Miranda

Astrophysics · Institute for Advanced Study

Funding provided by the National Science Foundation and NASA

Ryan Miranda's research interests include accretion disks and planet formation in and around stellar binaries, dust dynamics in protoplanetary disks, and numerical hydrodynamics.

Prahar Mitra

Quantum Field Theory · Institute for Advanced Study

Funding provided by the U.S. Department of Energy

Prahar Mitra studies the relationships between asymptotic symmetries in asymptotically flat spacetimes and soft theorems in quantum field theory. At IAS, he plans to explore the consequences of this relationship for four-dimensional scattering amplitudes when recast as two-dimensional correlation functions and for the black hole information paradox.

Timothy Morton

Astrophysics · Princeton University · *v*

Timothy Morton studies extrasolar planets. In particular, he is interested in the diversity of exoplanetary systems, and how to use all different sorts of observational data to inform our understanding of how planetary systems form and evolve.

Tejaswi Venumadhav Nerella

Cosmology, Astrophysics · Institute for Advanced Study

Schmidt Fellow; supported by Eric and Wendy Schmidt and the W.M. Keck Foundation Fund

Tejaswi Nerella's primary research is in cosmology. He aims to study the physical principles underlying futuristic probes, such as the 21-cm signal from cosmic dawn and the epoch of reionization, in order to shed light on both the practical challenges involved and their potential applications for studying the early universe.

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Kantaro Ohmori

Quantum Field Theory, String Theory · Institute for Advanced Study
Funding provided by the National Science Foundation

Kantaro Ohmori is interested in a broad range of issues in string theory and the quantum field theory. He is especially excited when intuitive realizations of intricate physics are achieved by means of mathematical, in particular geometric, structures. His main areas of interest and expertise include six-dimensional superconformal field theories and their compactifications.

Pavel Putrov

Theoretical Physics · Institute for Advanced Study
Funding provided by the U.S. Department of Energy

Pavel Putrov is interested in obtaining exact results in supersymmetric gauge theories. One of the directions that he plans to explore further at IAS is the relation between d-dimensional geometry and the physics of superconformal field theories in 6-d dimensions, arising from compactifications of fivebranes on d-manifolds.

Xiaoliang Qi

Theoretical Physics · Stanford University · *jvp*
Funding provided by the Fund for Memberships in Natural Sciences

Xiaoliang Qi's current research focuses on the relation of quantum entanglement, quantum gravity, and quantum chaos. He is interested in obtaining more explicit understanding of holographic duality based on new tools such as tensor networks, and new solvable models such as the Sachdev-Ye-Kitaev model.

David Radice

Astrophysics · Institute for Advanced Study
Frank and Peggy Taplin Member

The focus of David Radice's research at IAS is the study of binary neutron star mergers by means of fully relativistic numerical simulations. His goal is to develop robust theoretical predictions for the interpretation and guidance of upcoming multimessenger observations of merging neutron stars by gravitational wave and electromagnetic observatories.

Roman Rafikov

Astrophysics · University of Cambridge

Roman Rafikov works in the areas of planetary sciences, planet formation, N-body dynamics, fluid dynamics, accretion disks, and high-energy astrophysics.

Daniel A. Roberts

Theoretical Physics · Institute for Advanced Study

Funding provided by the National Science Foundation and the Paul Dirac Fund

Dan Roberts works on quantum gravity, quantum field theory, and quantum information theory. Using holography, he studies the relationship between chaos in strongly coupled quantum systems and black holes in anti–de Sitter space. He is also interested in machine learning and artificial intelligence (with an eye towards applications in theoretical physics).

Mauricio Romo

String Theory · Institute for Advanced Study

Funding provided by the U.S. Department of Energy and the Adler Family Fund

Mauricio Romo's current research lies at the interface between physics and mathematics. He has been focusing on two-dimensional field theories associated with the quantum geometry of compact Calabi-Yau manifolds and, recently, on three-dimensional theories related to invariants of 3-manifolds and knots.

Thomas Rudelius

Theoretical Physics · Institute for Advanced Study

Carl P. Feinberg Founders' Circle Member; additional funding provided by the National Science Foundation

Tom Rudelius works on a broad range of topics. On the formal side, his research focuses on quantum field theories in six dimensions. On the phenomenological side, he studies the weak gravity conjecture and its cosmological applications.

Marcel Manfred Schmittfull

Cosmology · Institute for Advanced Study

Bezos Member; additional funding provided by the National Science Foundation

Marcel Schmittfull studies the large-scale structure of the universe and gravitational lensing of the cosmic microwave background radiation. While at IAS, he plans to develop new analytic methods inspired by theory and simulation, aiming to add to our knowledge of the origin of the universe, dark energy, gravity, and neutrinos.

Shu-Heng Shao

Physics · Institute for Advanced Study

Zurich Insurance Company Member; additional funding provided by the National Science Foundation

Shu-Heng Shao has a wide range of interests in theoretical physics, including supersymmetry and conformal symmetry in diverse dimensions, scattering amplitudes in quantum field theory and string theory, and mathematical physics.

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dvp Distinguished Visiting Professor · *jvp* Junior Visiting Professor · *ra* Research Associate

Marko Simonović

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

Marko Simonović is researching different aspects of theoretical cosmology, including inflation, primordial non-Gaussianities, and large-scale structure. At IAS, he plans to focus on the study of large-scale structure as a tool to investigate statistics of the initial conditions and possible modifications of gravity.

Marcus Spradlin

Theoretical Physics · Brown University

Marcus Spradlin studies the application of string theory to problems in quantum field theory and gravitational physics. At IAS, he will continue his recent work exploring the rich mathematical structure of scattering amplitudes in gauge theory and gravity.

Douglas Stanford

Theoretical Physics · Institute for Advanced Study · *m*
Funding provided by the Simons Foundation

Douglas Stanford is studying quantum gravity, quantum field theory, and string theory. He has worked on the AdS/CFT description of black hole interiors and the relationship to chaotic dynamics in quantum field theory.

Rashid Sunyaev

Astrophysics · Max-Planck Institute für Astrophysik · *dvp*
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.

Yuan-Sen Ting

Cosmology · Institute for Advanced Study and Harvard University
Martin A. and Helen Chooljian Member

Yuan-Sen Ting is interested in near field cosmology, chemical tagging, stellar spectroscopy, hemodynamic models of the Milky Way, machine learning, neural network, and stellar populations.

Jihad Touma

Applied Mathematics, Astrophysical Dynamics · American University of Beirut · *f*

Jihad Touma studies planetary and galactic dynamics. At IAS, he plans to pursue joint work with Scott Tremaine on the statistical mechanics of self-gravitating stellar clusters around supermassive black holes in galactic nuclei.

Ken Van Tilburg

Particle Physics · Institute for Advanced Study
AMIAS Member

Ken Van Tilburg's research covers various aspects of particle physics phenomenology, in particular model building and novel techniques to look for new physics. His current work focuses on the development of precision search strategies for dark matter, gravitational waves, new forces, and other manifestations of weakly coupled physics both in and beyond the Standard Model.

Tomer Volansky

Particle Physics · Tel Aviv University
Funding provided by The Ambrose Monell Foundation

Tomer Volansky's research interests span topics in particle cosmology, phenomenology of high-energy physics, and dark matter physics. He is mainly interested in the interface between these subjects. At IAS, he plans to continue his study of the theory and detection of dark matter as well as LHC phenomenology.

Anastasia Volovich

High-Energy Theory · Brown University
IBM Einstein Fellow

Anastasia Volovich works on theoretical physics: quantum field theory, string theory, and related areas in mathematics.

Juven Chun-Fan Wang

Theoretical Physics · Institute for Advanced Study
Funding provided by the Corning Glass Works Foundation Fellowship Fund and the National Science Foundation

Juven Wang's research concerns the emergence-reductionism interplay between condensed matter and high-energy physics. Inspired by the physical problems from exotic entangled quantum matter, he investigates the statistical and geometrical properties that emerge from both quantum and classical many-body systems, reconciling the issues of symmetry, topology, anomalies, lattice, and strong interactions.

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dvp Distinguished Visiting Professor · *jvp* Junior Visiting Professor · *ra* Research Associate

BingKan Xue

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

BingKan Xue works in systems biology and studies evolutionary dynamics and adaptation mechanisms from a theoretical perspective. He is interested in the phenomena of phenotypic variations and trans-generational inheritance among biological populations in response to changing environments.

Ellis Ye Yuan

Theoretical Physics · Institute for Advanced Study
Funding provided by the U.S. Department of Energy

Ellis Yuan is interested in string theory and quantum field theory. His current research focuses on general aspects of the scattering amplitudes and the mathematical structures therein.

Barak Zackay

Astrophysics · Institute for Advanced Study
Infosys Member

Barak Zackay is developing novel statistical and algorithmic techniques for discovering exciting astrophysical objects, such as pulsars, fast radio bursts, gravitational waves, supernovae and exoplanets. He has developed various astrophysical image processing methods, including proper image subtraction. He is always seeking new opportunities and challenges.

School of Social Science

Administrative Officer: Donne Petito

FOUNDED IN 1973, THE SCHOOL OF SOCIAL SCIENCE takes as its mission the analysis of contemporary societies and social change. It is devoted to a pluralistic and critical approach to social research from a multidisciplinary and international perspective. Operating under the guiding principles of informality and collegiality, and with a shared understanding that the social sciences are not to be narrowly defined, the School brings together scholars with various perspectives, methods and topics, providing a space for intellectual debate and mutual enrichment. Scholars are drawn from a wide range of fields, notably political theory, economics, law, psychology, sociology, anthropology, history, philosophy, and literature, to examine historical and contemporary problems.

Each year, the School designates a theme, which is neither exclusive nor excluding. The theme for the 2017-18 academic year is "The Social Sciences in a Changing World," led jointly by Didier Fassin, James D. Wolfensohn Professor in the School, and Visiting Professor George Steinmetz, Charles Tilly Collegiate Professor of Sociology and Germanic Languages and Literatures, University of Michigan, Ann Arbor.

Over the past century and a half, social scientists have conducted research on a multiplicity of topics and societies, including the worlds of science and technology. Similar investigation into their own disciplines, however, had been relatively limited. Recently, however, historians and sociologists, in particular, have begun to examine the politics and practices of the social sciences, their epistemologies and methods, their institutionalization and professionalization, their national development and colonial expansion, their heterogeneous globalization and local contestations, their public presence and role in society. Strikingly, this trend is concomitant with a reconfiguration of their landscape and a reshaping of their borders with neighboring fields. The history, sociology, and philosophy of social science have evolved separately and remain relatively separate communities, but their studies provide new challenges as the humanities come under increasing pressure while cognitive and evolutionary sciences as well as method-driven and big data approaches stake out new claims to understand society. It is thus an interesting time to gather a group of scholars and undertake a critical inquiry into the social sciences. The theme welcomes multiple and diverse perspectives in the social sciences and the humanities. The constitution and evolution of scientific fields, controversies and their resolution, debates within and across disciplines, explicit and implicit construction of knowledge, comparison between countries or regions of the world, and relationships between the social sciences and society at large are some of the topics deemed of particular relevance. Through the conversations that will occur during the year, we hope to contribute to a social science of social sciences.

Didier Fassin

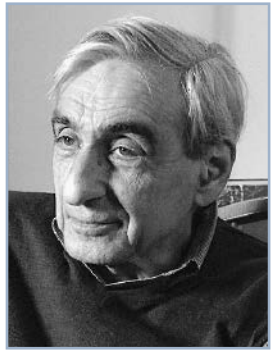
James D. Wolfensohn Professor

Didier Fassin is an anthropologist and a sociologist who has conducted fieldwork 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, focusing on the AIDS epidemic and global health. He later developed the field of critical moral anthropology, which explores the historical, social, and political signification of moral forms involved in everyday judgment and action as well as in the making of national policies and international relations. He recently conducted an ethnography of the state, through a study of urban policing as well as the justice and prison systems. His current work is on the theory of punishment, the politics of life, and the public presence of the social sciences.

Joan Wallach Scott

Professor Emerita

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.



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 religion and politics. He continues to work on volumes three and four of a major collaborative project focused on the history of Jewish political thought.

Ayten Alkan

Urban Studies, Critical Animal Studies · Institute for Advanced Study

Ayten Alkan's research revisits the history of urbanization on the tracks of ever-changing human-nonhuman relations. It does so through a theoretical quest to incorporate the mentality of "Animal Rights" into the "Right to the City" debate. Her aim is to comprehend the city and urban life so as to include "other animals," by focusing on the particular case of "stray animals."

Johanna K. Bockman

Sociology · George Mason University · *v*

Johanna Bockman investigates a variety of globalizations, in particular socialist and non-aligned forms. She is currently examining such trade and financial institutions as the Bank of Credit and Commerce International (BCCI), the Yugoslav Bank for International Economic Cooperation, and the UN Conference on Trade and Development.

Yvonne Chiu

Political Science · Institute for Advanced Study · *v*

Yvonne Chiu is studying the soft authoritarianism in East Asia which, unlike the Middle East and Russia, bears the hallmarks of modernity and achieves significant economic growth. These phenomena interact uniquely with authoritarianism's accompanying self-censorship, withdrawal from public life in favor of self-interested material accumulation, and anomie.

Charly Coleman

Intellectual and Cultural History; Eighteenth-century France · Columbia University

Deutsche Bank Member

At IAS, Charly Coleman is writing a history of economic theology in eighteenth-century France, with an eye to the influence of sacramental theory on financial practice. The project aims to uncover a distinctly Catholic ethic of capitalism that, *pace* Weber, privileged the marvelous over the mundane, and the immediacy of enjoyment over delayed gratification.

Peter Coviello

American Literature, Queer Studies, Political Theology · University of Illinois at Chicago

Peter Coviello has written extensively about intimacy, nation, and the racial history of sexuality in nineteenth-century America. His current project considers the fate of early Mormonism, its theological as well as colonial ambitions, and the eventual disciplining of its carnal imagination. His work looks to reconceive "secularism" as a biopolitics.

Alice Crary

Philosophy · New School for Social Research

Alice Crary is rethinking the idea, central to social epistemology, that an appreciation of how structural bias shapes individual experience is necessary for social understanding. With accents on cognitive disability and animals, she shows that we need moral imagination to do justice not only to rational social phenomena but to non-rational aspects of animate life.

Anne-Claire Defossez

Sociology · Institute for Advanced Study · *v*

Anne-Claire Defossez's current work addresses the question of women's political participation and representation by exploring the trajectory and experience of women formally involved in politics at local and national levels in France. In particular, she is analyzing how family background and personal history, as well as class, residence, and ethnicity, have influenced their engagement, career, and practices in politics.

Chitralekha Dhamija

Anthropology · Jawaharlal Nehru University

Chitralekha Dhamija's work describes a new "militancy" in (Indian) Kashmir. Exploring its linkages with the uneven institutional flows of a troubled modernity, she particularly examines how digital discourse and its frequent erasures reconfigure not just social exchange and worship, ideas of self, community and nation, but also modes of political resistance.

Paul DiMaggio

Sociology · New York University

Princeton Foundation for Peace & Learning Founders' Circle Member

At IAS, Paul DiMaggio is working on a book that develops a framework for the social-scientific study of culture that takes into account recent work on social cognition and cognitive neuroscience, and applies it to a series of puzzles: How does meaning work? What are values? How (and when) do elements of a culture cohere? How does culture change?

Jacob S. T. Dlamini

Social and Political History of Conservation in Africa · Princeton University

Friends of the Institute for Advanced Study Member

Jacob S. T. Dlamini is interested in the social and political history of protected areas in Africa, with a particular focus on the relationship between conservation and African/black nationalism. His research is driven by a seemingly simple question: what did black nationalists think about conservation?

Bregje van Eekelen

Anthropology, History · Erasmus University Rotterdam

Bregje van Eekelen's book project on brainstorms traces the history of creative thinking in military and industrial settings (1935–1965). It asks how the concept of "creativity" emerged in response to military and managerial rationalities, the standardization/disciplining of work, and the incorporation of social scientists in corporate America.

Jean-Louis Fabiani

Historical Sociology of the Social Sciences · Central European University

Funding provided by the Florence Gould Foundation Fund

Jean-Louis Fabiani's project has three aims: to give a precise account of the current circulation of ideas in the social sciences; to produce an overview of "the reclaiming of the classics"; and to use fieldwork on post-socialism in Central Europe and compare it with post-colonial situations in order to analyze disciplinary changes.

Sara R. Farris

Sociology · Goldsmiths, University of London · *v*

Sara Farris is investigating the application of corporatized logics to the management of public care, as well as the presence of big corporations in the sector. She explores the daily regulations and rationales of these new corporatized arrangements and the ways they impact the recipients of care and the labor conditions of migrant care providers.

Nicolas Guilhot

History of Political Thought · CNRS, Center for International Research in the Humanities and Social Sciences

Deutsche Bank Member

Nicolas Guilhot's research focuses on the concepts of decision and rationality in modern political thought, and in particular on the connections between early twentieth-century decisionism in legal theory and postwar notions of rational choice.

Johan Heilbron

Sociology · Centre Européen de Sociologie et de Science Politique, Université Paris 1

Louise and John Steffens Founders' Circle Member

Johan Heilbron's project is about the internationalization of the social sciences. After assessing different modes in which social scientists have historically been entangled in cross-border exchanges, it will take up current issues with the aim of presenting a fresh view of the promises and pitfalls of globalizing social science.

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

Julia C. Hell

European Historical Cultural Studies · University of Michigan · *v*

Julia Hell is completing a book on European empires and the Fall of Rome. Tracing an arc from the Roman Empire to the Third Reich, this project reconstructs the long afterlife of the Roman Empire, arguing that acts of post-Roman mimesis revolved around scopic scenarios visualizing the end of the Roman Empire in ruins.

Gubad Ibadoghlu

Economics, Political Sociology · The Economic Research Centre of Azerbaijan · *v*

Gubad Ibadoghlu is the author of more than twenty books in the area of politics on natural resources and revenue management. He has commenced his career at the Economic Research Center, which promotes economic development and good governance. His current research focuses on escaping the middle income trap in resource rich post-Soviet countries.

Miriam Kingsberg Kadia

History of Modern Japan, Global History, History of Knowledge · University of Colorado

Miriam Kingsberg Kadia is working on a generational biography of the cohort of Japanese human scientists active from the 1930s through the late 1960s—the "transwar period." This project explores how scholars, at their moment of greatest authority over notions of national identity, (re)framed knowledge of "Others" in the context of imperialism, war, occupation, and independence.

Kristoffer Kropp

Sociology · Roskilde University

Kristoffer Kropp's research focuses on the production of social scientific knowledge, the relation between social science and political institutions, and European integration. At IAS, he is working on the changing relations between social science knowledge production in Europe and European Union research policy in a field-theoretical perspective.

Nicolas Langlitz

Anthropology, History of Science · The New School for Social Research

Deborah Lunder and Alan Ezekowitz Founders' Circle Member

The social sciences started out as human sciences but shed this constraint as evolutionary anthropologists turned their attention to animal groups. This confronts us with a paradox: why has the collapse of the dichotomies of nature/society and nature/culture not led to a rapprochement between humanities, social research, and natural sciences?

Tomaž Mastnak

History of Social and Political Thought · Research Centre of the Slovenian Academy of Sciences and Arts · *v, f*

Tomaž Mastnak focuses on the crisis of liberalism as an epistemological problem. Drawing on reflections on the crisis of liberalism from the late nineteenth century onward, he will explore the contribution of social sciences and humanities to the liberals' declining ability to reflect on today's crisis of liberalism.

John Lardas Modern

Religious Studies · Franklin & Marshall College

John Lardas Modern is interested in the religious history and religious affects of cybernetics. His research agenda involves, first, charting different moments in the pre-history of the cybernetic boom at mid-century and, second, investigating the proposition that the brain is a machine of the highest order under which all other forces in the human world play subservient roles.

Álvaro Morcillo-Laiz

International Relations, Political Sociology, History of Social Sciences · Centro de Investigación y Docencia Económicas, Mexico

Wolfensohn Family Member

Álvaro Morcillo-Laiz is interested in whether the expertise and material resources of science patrons, i.e. foundations, shape sociology, political science, and international relations. He studies whether donors, by granting the means necessary for scholars to pursue certain research questions, wield a "philanthropic domination" over what we think about society.

Paulina Ochoa Espejo

Political Theory · Haverford College

Who should have territorial rights? In this project, Paulina Ochoa Espejo turns to Derecho Indiano (Spanish Colonial Law) to find historical examples to argue that territorial rights do not belong to individuals, pre-political peoples, or legitimate states; instead it is grounded communities—pueblos—that do and should have these entitlements.

Ayşe Parla

Anthropology · Sabanci University · *v*

Ayşe Parla is pursuing two projects. The first explores the relationship between morality and the politics of emotion in the political landscape of contemporary Turkey. The second is an inquiry into methodological and literal surfaces/depths through a historical and ethnographic exploration of the necropolitics of wells/holes.

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

Silvia Pasquetti

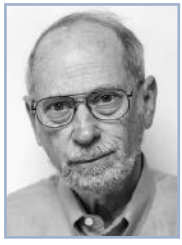
Sociology · Newcastle University

Silvia Pasquetti's book project examines the distribution of militarism, surveillance, and securitized humanitarianism over "suspect populations." Based on fieldwork within and across an Israeli city and a West Bank refugee camp, it studies how targeted people's emotions relate to—subvert, follow, or amplify—the practices of control imposed on them.

Amín Pérez

Sociology · École des Hautes Études en Sciences Sociales, Paris

Amín Pérez's work offers a reappraisal of the sociology of empire through the path-breaking thought and method developed within Pierre Bourdieu's work during the Algerian War of Independence. Drawing on extensive primary research, it reveals the intellectual revolution that took place in Bourdieu's fieldwork, and how it gave birth to a new understanding of domination.



Lawrence Rosen

Anthropology · Princeton University · *v, f*

Popular commentators see tribes as exclusive and pugnacious, academic writers see them as having specific structural forms or evolutionary roles. In the first comprehensive study of tribes in half a century, the paradigm suggested will emphasize the distinctive cultural properties of tribes, their adaptability, and their continuing analytic and political relevance.

Janick Marina Schaufelbuehl

History of International Relations · Université de Lausanne

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

Janick Marina Schaufelbuehl's current research explores the role of U.S. business interests in the emergence of the European Union, from the 1950s to the end of the Cold War. At IAS, she will focus on the history of transatlantic transfers and the Americanization of Western Europe in the field of economics.

Mehdi Shadmehr

Political Economy of Authoritarian Regimes, Revolution and Regime Change, Repression and Censorship, Leadership, and Ideology · University of Calgary

Richard B. Fisher Member

Mehdi Shadmehr is interested in regime change in authoritarian regimes. His research focuses on information frictions and coordination problems in the interactions between dissidents and the state.

Carel E. Smith

Law and Philosophy · Leiden University · *v*

Carel Smith's project challenges the dominant approach in legal theory to frame legal reasoning as a rule-based activity. By mobilizing metaphor theory and speech act theory, he critically examines the role of rules and standards in legal adjudication and exposes the pivotal role of exemplars in legal reasoning, such as subsumption and weighing and balancing.

George Steinmetz

History, Philosophy, and Sociology of the Social and Human Sciences · University of Michigan · *vp*

George Steinmetz's research at IAS will concern the history, philosophy, and sociology of the social sciences. He is completing a book on the colonial origins of sociology, and writing a series of essays on the philosophy of the social sciences and problems of scientific and academic freedom.

Peter D. Thomas

Political Philosophy, History of Political Thought · Brunel University

Peter Thomas's research at IAS focuses on processes of authorization, translation, globalization, and condensation in the development of subaltern studies, from its origins in a creative reading of Antonio Gramsci's political thought, through its subsequent international diffusion, to the contemporary contestation of its legacies.

Shatema Threadcraft

Political Science · Dartmouth College

Ralph E. and Doris M. Hansmann Member

Shatema Threadcraft is working on a book project on race, gender, and the politics of death in the United States. The project examines how necropower has operated historically and how it operates in black communities today, how the politics of gender, sexuality, and ability are implicated in the politics of death, and how necropower is justified and contested in black communities.

Everett Yuehong Zhang

Anthropology · Institute for Advanced Study · *v*

Everett Zhang is completing a project on how survivors coped differently with two major earthquakes in China—their trauma, ways of grieving, psychological intervention, the relationship between the state and the society, and the sense of and struggle for social justice. He is also starting a project on *kangfu* (recovery) in Chinese psychiatry.

Andrew Zimmerman

Transnational History · The George Washington University
AMIAS Member

Andrew Zimmerman's book project highlights the decisive role played by black and white revolutionaries in the American Civil War. Departing from accounts centered on national elites, it shows how transnational plebeian political cultures, particularly African-American conjure and German-American communism, turned a war for the Union into a revolution against slavery.

Agata Zysiak

Historical Sociology · University of Łódź, Poland

Agata Zysiak is researching the role of social sciences in building the socialist university in postwar Poland. The project of the egalitarian and democratic institution was mainly conceptualized, discussed, and put into action by sociologists themselves. Eventually, they also became researchers who could and did diagnose the socialist university's successes and failures.

Program in Interdisciplinary Studies

The Program in Interdisciplinary Studies explores different ways of viewing the world, spanning a range of disciplines from physics and astrophysics, geology, paleontology, and biology, to artificial intelligence, cognitive psychology, and philosophy. The most recent interdisciplinary focus is on questions related to the origins and nature of cognition. The program is headed by Professor Piet Hut.

Piet Hut

Professor

One focus of Piet Hut's research is computational astrophysics, in particular multiscale multiphysics simulations of dense stellar systems. Another focus is the question of the origins of life, on Earth as well as elsewhere in the universe, for which he is a foreign Principle Investigator at ELSI, the Earth-Life Science Institute at the Tokyo Institute of Technology. A third focus is interdisciplinary explorations in the areas of cognitive science and philosophy of science centered around questions involving the nature of knowledge, which led him to co-found YHouse, a new institute in Manhattan dedicated to outreach and research in the origins and nature of awareness. The author of more than two hundred publications, Hut was honored in 2004 when a main-belt asteroid was named "17031 Piethut" by the International Astronomical Union's Committee on Small Body Nomenclature.

Henderson (Jim) Cleaves

Chemistry · Carnegie Institution for Science

Jim Cleaves is studying the origin of life on Earth and elsewhere, specifically with the question of how chemistry becomes biology. He is interested in how simple organic compounds are produced from cosmically abundant inorganic compounds under geochemically plausible conditions, and how these compounds self-organize to form more complex and potentially self-replicating systems.

Thomas Doctor

Origins and Nature of the Mind · Rangjung Yeshe Institute and Kathmandu University

Recognizing that both fields typically assume that consciousness emerges without the involvement of a singular and permanent "self" that is in central control, Thomas Doctor wishes to explore the ways artificial intelligence research and Buddhist philosophy may inform one another.

Ayako Fukui

Harmonic Analysis · Araya, Inc.

Ayako Fukui is working on a project exploring the nature and origin of awareness with a cross-disciplinary approach, engaging science, humanities, art, design, and technology. She is particularly interested in mathematical models of complex systems, including consciousness. Her interests also include research on creativity, imagination, and inspiration.

Yuko Ishihara

Philosophy · Earth-Life Science Institute, Tokyo

Yuko Ishihara's main research interests are in phenomenology, transcendental philosophy, and Japanese philosophy. Currently, she is investigating the nature of the scientific attitude (and knowledge) as it relates to the natural, transcendental and non-dual attitudes (and knowledge).

Barnaby Marsh

Evolutionary Dynamics · Harvard University

With training in evolutionary biology, economic theory, and psychology, Barnaby Marsh has helped to pioneer new approaches to decision strategies in complex and dynamic environments. He is currently studying how chance events influence fitness landscapes (especially effects of cascades), and novel approaches to awareness and representation.

Ohad Nachtomy

History of Philosophy and Science · Bar-Ilan University

Ohad Nachtomy's main objectives for the coming year are to complete a book manuscript on infinity, unity, and life in Leibniz's philosophy, to edit a collective volume on infinity in early modern philosophy, and to compose an introduction to philosophy through literary texts.

Michael Th. Rassias

Mathematical Analysis, Analytic Number Theory · University of Zurich

Michael Rassias's research interests lie in mathematical analysis, analytic number theory, and more specifically in exponential/trigonometric sums, zeta functions, approximation theory, functional equations, and analytic inequalities. He is also interested in the distribution of prime numbers, the analytic investigation of elliptic curves, and cryptography.

Michael Solomon

Bioethics · Institute for Advanced Study

Michael Solomon's activity for the coming year stem from his bioethics perspective, from the implications of AI for the changing practice of medicine, from interest in biology and neuroscience, and from general curiosity. He will focus on the moral status of machines that can think. What obligations will we owe them and what obligations will they think we deserve?

Edwin L. Turner

Astrophysics · Princeton University

Edwin Turner is working on statistical biases and estimators for samples of exoplanets, on the Subaru Strategic Exploration of Exoplanets and Disks project, and on implications of complexity in cellular automata systems for the limits of reductionism, as well as related topics in the philosophy of science.

Olaf Witkowski

Complex Systems, Artificial Life · Earth-Life Science Institute, Tokyo Institute of Technology

Olaf Witkowski's research is in information dynamics in the origins of cognitive life and collective intelligence. His approach uses large-scale artificial life simulations, evolutionary robotics, machine learning, and information and game theories to study the computation of life, the major transitions in evolution, and the future of intelligent societies.

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.

Graham Farmelo

Writer; Fellow, Churchill College, University of Cambridge

Graham Farmelo is completing a book on the relationship between fundamental physics and pure mathematics. During his visit, he will be revising five chapters of the "modern developments" section of the book, featuring many contributions from IAS theoreticians.

Michael Pembroke

Justice of the Supreme Court of New South Wales, Australia

While at the Institute, Michael Pembroke will finalize the concluding section of his proposed new book about the new world order ushered in by the Korean War and its consequences to stability in Northeast Asia.

Zia Haider Rahman

Novelist

Zia Haider Rahman is developing a social enterprise with the mission to raise transparency in the public space, drawing on a background in anti-corruption activism, financial services law and investment banking, and on training in mathematics.

Natalie Wolchover

Writer

Natalie Wolchover is a science writer who covers developments in physics and related fields.

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. Composer David Lang continues as Artist-in-Residence, curating the Edward T. Cone Concert series and hosting conversations with artists, while pursuing his creative and intellectual work as part of the Institute's community of scholars.

David Lang

Composer

David Lang is a Pulitzer Prize-winning composer whose works have been performed worldwide by distinguished artists and ensembles, including the BBC Symphony, the International Contemporary Ensemble, eighth blackbird, Santa Fe Opera, the New York Philharmonic, the Netherlands Chamber Choir, the Boston Symphony, the Munich Chamber Orchestra, and the Kronos Quartet. A recipient of the prestigious Grammy Award, Lang has received numerous honors, including Musical America's Composer of the Year, Carnegie Hall's 2013–14 Debs Composer's Chair, the Rome Prize, the BMW Music-Theater Prize (Munich), and grants from the Guggenheim Foundation, the Foundation for Contemporary Performance Arts, the National Endowment for the Arts, the New York Foundation for the Arts, and the American Academy of Arts and Letters. Lang is Professor of Music Composition at the Yale School of Music and is co-founder and co-artistic director of New York's legendary music festival Bang on a Can.

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