

# IAS

INSTITUTE FOR  
ADVANCED STUDY



Faculty and Members  
2018–2019

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*

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## Introduction

FOR NEARLY NINETY YEARS, long and complex chains of knowledge have developed in numerous and astounding ways through research originating at the Institute for Advanced Study—from the development of programmable computers and the uncovering of deep symmetries of nature to advances in societal understanding and historical practice.

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 eight 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-two out of sixty Fields Medalists, and seventeen out of nineteen 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 past Co-Chair (2009–17) of the InterAcademy Council, Dijkgraaf is a distinguished public policy adviser and passionate advocate for science and the arts.

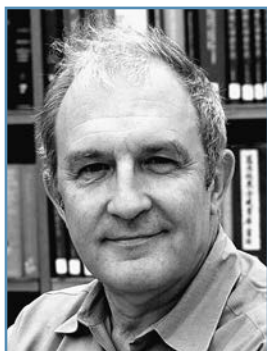


# School of Historical Studies

*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 as it brings together disciplines that are normally isolated in separate departments in traditional research universities. The School supports all inquiry for which historical methods and approaches are appropriate 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, but it also promotes research in areas beyond the scholarly interests of its Faculty. The School has supported scholars whose work focuses on other regions, including Central Asia, India, Africa, and the Americas.

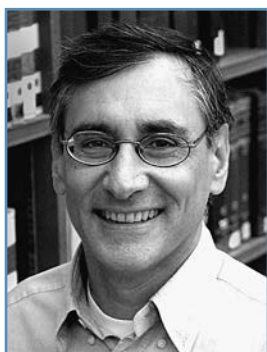
The Members of the School represent a variety of nationalities and career stages, with a continually increasing number of young researchers and scholars from less privileged countries. The Faculty and Members of the School do not adhere to any one point of view but practice a range of methods of inquiry and scholarly styles, both traditional and innovative, ranging from the edition of texts and the analysis of images to co-operations with the social and natural sciences. 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 supports research that often is not possible in other academic environments and encourages the creation of new historical enterprises.



### Yve-Alain Bois

*Professor · Art History*

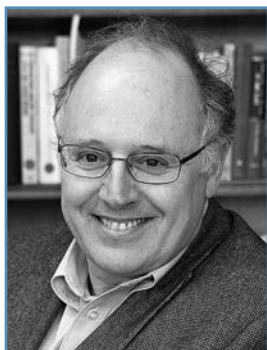
A specialist in twentieth-century European and American art, Yve-Alain Bois is recognized as an expert on a wide range of artists, from Henri Matisse and Pablo Picasso to Piet Mondrian, Barnett Newman, and Ellsworth Kelly. The curator of a number of influential exhibitions, he is currently working on 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.

## FACULTY

**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](http://www.throughrussianeyes.com), which highlights aspects of Russia's foreign and defense policies that do not see the light of day in mainstream media. He is currently completing a work detailing the origins of the Second World War, focusing on the role of ideology.

**Myles W. Jackson***Professor · History of Science*

An eminent and authoritative explorer of the intersections between science, technology, aesthetics, history, and society, Myles Jackson interweaves economic, commercial, and scientific insights. His scholarship has had lasting impact and is noted for its cross-disciplinary methodology and range of study—from the artisanal production of scientific knowledge in nineteenth-century Germany to issues of intellectual property, knowledge sharing, race and genomics, bioengineering, and the interactions between musicians, natural scientists, and radio engineers.





### Sabine Schmidtke

*Professor · Islamic Intellectual History*

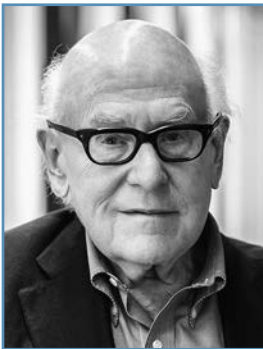
Sabine Schmidtke is a scholar of Islamic intellectual history whose research has transformed perspectives about the interrelations and connections among different strands of intellectual inquiry, across time, place, religions, and philosophical schools. Schmidtke is currently working on the history of 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 Yemen. She is also engaged in a comprehensive study of the Muslim reception of the Bible, a topic on which she has published extensively.



### Francesca Trivellato

*Professor · Early Modern History*

A leading historian of early modern Italy and continental Europe, Francesca Trivellato has made significant and groundbreaking contributions to our understanding of the organization and culture of the marketplace in the pre-industrial world. Trivellato's original and imaginative research has revitalized the study of early economic history, and her influential work on cross-cultural trade intersects the fields of European, Jewish, Mediterranean, and global history, religion, and capitalism.



### Glen W. Bowersock

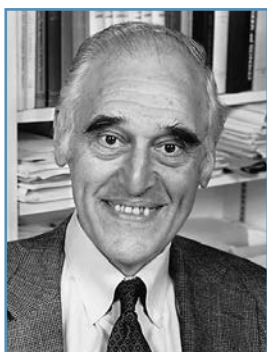
*Professor Emeritus · Ancient History*

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

## FACULTY

**Caroline Walker Bynum***Professor Emerita* · European Medieval History

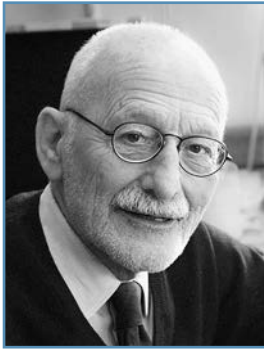
Caroline Bynum studies the social, cultural, and intellectual history of Europe from the early Middle Ages to the early modern period. Her books have explored women's religious movements, the history of the body, the role of sacrifice in religion, and the materiality of late medieval art and devotion 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.

**Jonathan Israel***Professor Emeritus* · Modern European History

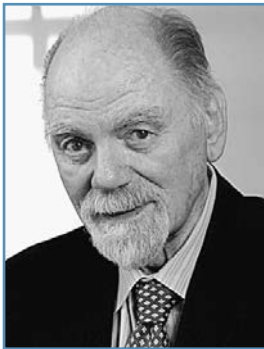
Jonathan Israel's work is concerned with European and colonial history from the Renaissance to the eighteenth century. His recent work focuses on the impact of radical thought (especially Spinoza, Bayle, Diderot, and eighteenth-century French materialists) on the Enlightenment and on the emergence of 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). The fourth and sixth volumes (numerous studies on medieval and Renaissance art, on Michelangelo Merisi da Caravaggio, and various lecture series) are in proof. A gathering of his essays on twentieth-century art has appeared in Italian as *L'arte della storia dell'arte* (2008). His current research involves antique sculpture and further work on Bernini and Caravaggio.



### 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 in His Time* (2014), essays in the cultural and intellectual history of thinking about war, an expanded version of which was translated for publication in Germany in 2017. He is co-author and editor of a book on Clausewitz's historical method that will appear in Germany in the winter of 2018.



### 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.

## MEMBERS AND VISITORS

**Benjamin Anderson**

*Byzantine Art and Architecture* · Cornell University · *f*  
*Funding provided by the Hetty Goldman Membership Fund*

Benjamin Anderson is studying the relationship between tragedy and visual form in the medieval and early modern art of central and eastern Europe.

**Hassan Farhang Ansari**

*Islamic Law and Theology* · Institute for Advanced Study  
*Funding provided by Carnegie Corporation of New York*

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

**Michelle Armstrong-Partida**

*Medieval Gender, Sexuality, Women's History* · University of Texas at El Paso  
*Funding provided by The Gladys Kriebel Delmas Foundation*

At IAS, Michelle Armstrong-Partida will be working on a book project that is a comparative study of concubinage across the Mediterranean. Her research examines the overlap between informal unions, clandestine marriage, and spousal desertion.

**Barbara Baert**

*Iconology, Medieval Art, Anthropology* · Katholieke Universiteit Leuven · *s*  
*Funding provided by the Fund for Historical Studies*

Barbara Baert's research is situated in the field of iconology, visual anthropology, and medieval art. At IAS, she will work on time-paradigmata in art and prepare a book on kairotic energies in visual culture.

**Eugenio Biagini**

*History of Ireland in the Twentieth Century* · University of Cambridge · *f*  
*Willis F. Doney Member*

Eugenio Biagini's work has focused on the emergence of a culture of liberal democracy and pluralism in Britain and Ireland since the 1850s. His current projects involve a monograph on religious minorities and national identity in Ireland, 1912–72, and, as general editor, a multi-volume cultural history of democracy since antiquity.



### Ralf Bockmann

*Byzantine Archaeology and History of Art* · Deutsches Archäologisches Institut, Rome

*Funding provided by the Hetty Goldman Membership Fund*

As part of a book project, Ralf Bockmann will examine how in the Byzantine North changing religious practices were conveyed and reflected in the evolution of ecclesiastical buildings. He is especially interested in the communicative, cultural, and political value of the cult of saints in the context of wider social developments.



### Stephen Bokenkamp

*Medieval Chinese Religion and Literature* · Arizona State University · *f*  
*Edwin C. and Elizabeth A. Whitehead Fellow*

Stephen Bokenkamp's project is an annotated translation of the *Declarations of the Perfected*, a collection of divine poetic instructions received by the Daoist Yang Xi (330–ca. 386). These fragments of revealed literature were collected by the eminent scholar Tao Hongjing (456–536), who added a history and provided a scholarly apparatus.



### Marilyn Booth

*Arab and Arabic Intellectual History, Gender History, Translation Studies*  
University of Oxford · *f*

*Willis F. Doney Member*

Marilyn Booth's project on Arabic conduct pedagogy, 1860s–1920s, focuses on overlapping genres (etiquette manuals, school-texts, marriage treatises, novels) in Arabic, produced mostly in Egypt. What are their gender-modulated visions for forming a modern polity, in the context of anxiety discourses regarding the reading and leisure habits of the young?



### Warren Brown

*Early Medieval Social History* · California Institute of Technology · *s*  
*Funding provided by the Patrons' Endowment Fund*

Warren Brown studies the social and political history of early medieval Europe, with a focus on power, law, and writing. His work has explored conflict resolution both peaceful and violent, and the use of documents by lay people. He is currently writing a book on images of the laity in Carolingian legal formularies.



### Juliette Cadiot

*Russian and Soviet Studies* · École des Hautes Études en Sciences Sociales, Paris

*William D. Loughlin Member*

Juliette Cadiot researches modern Russian and Soviet history, with a particular focus on the history of the social sciences, political history, and the socio-history of law and justice. Her new project on law and revolution in the Soviet Union explores the peculiarities of Soviet criminal law and practices of justice (and terror) in the USSR.



## MEMBERS AND VISITORS

**Cristina Carusi**

*Ancient Greek History, Greek Epigraphy* · The University of Texas at Austin  
*Martin L. and Sarah F. Leibowitz Member*

At IAS, Cristina Carusi is completing a book manuscript on public building and the Athenian democracy. The goal of her research is to investigate the economic impact of building programs on the Athenian society of the classical age and to explain the complex relationship between those programs and the democratic regime.

**Julian Casanova**

*Social History, Comparative History* · Universidad de Zaragoza  
*Funding provided by The Andrew W. Mellon Foundation*

Julian Casanova's project on the politics of violence in twentieth-century Europe reflects an interest in social history and processes of change, with special emphasis on civil wars and revolutions; the use of comparative history and an interdisciplinary dialogue between history and the social sciences; and an inquiry into the main demonstrations of collective violence in Europe during the twentieth century.

**Hilde De Weerd**

*Chinese Medieval History* · Universiteit Leiden · s  
*Funding provided by the Fund for Historical Studies*

Hilde De Weerd is working on a history of the vernacularization of political advice in Eastern Eurasia. This work consists of a history of the emergence of medieval Chinese mirrors for princes and their adaptation in the worlds of Japanese samurai, Mongol and Manchu emperors, and Chinese literati.

**Martino Diez**

*Intellectual History of the Islamic World* · Università Cattolica del Sacro Cuore, Milan · s  
*Willis F. Doney Member*

Martino Diez is mainly interested in the intellectual history of the medieval Islamic world, with a special focus on religious pluralism. At IAS, he plans to work on the world chronicle of the Copto-Arabic historian al-Makin (thirteenth century) and its reception among Muslim scholars.

**Katherine Epstein**

*Modern Anglo-American Legal, Diplomatic, and Military History* · Rutgers, the State University of New Jersey  
*Frederick Burkhardt Fellowship funded by the American Council of Learned Societies*

Katherine Epstein's research looks at national security and intellectual property in U.S. and British history. She is interested in how the state and defense contractors formed new relationships to acquire advanced weapons technology, leading to the classification of scientific and technological information as secret and testing liberal property norms.



### Nergis Ertürk

*Comparative Literature* · The Pennsylvania State University · s  
*Funding provided by the Herodotus Fund*

Nergis Ertürk is completing a book project on the literary writings of Turkish communist and formerly communist writers educated in the Soviet Union during the 1920s and 1930s. Discussing materials originally published in Turkish and Russian, this book aims to animate the rich but understudied literary archive of the entangled Anatolian and Bolshevik revolutions.



### Alejandro Garcia-Sanjuan

*History of al-Andalus* · Universidad de Huelva · s  
*Funding provided by the Fund for Historical Studies*

At IAS, Alejandro Garcia-Sanjuan will be preparing a monograph on the reception of al-Andalus in contemporary Spanish culture, with a focus on al-Andalus and Reconquista in Spanish scholarship.



### Karl Gerth

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

Karl Gerth's research project reinterprets the first three decades of the People's Republic of China, 1949–76. The era has been seen as explicitly anticapitalist, hyperegalitarian, and anticonsumerist. By contrast, this project argues that many of the policies of the period had unintended effects that negated the socialist revolution.



### Sabine Go

*Maritime Governance Institutions in Early Modern Europe* · Vrije Universiteit, Amsterdam · f  
*Funding provided by the Fund for Historical Studies*

Sabine Go is working on the development of general average laws and procedures during the early modern period. General average is the practice of apportioning costs arising from jettisoning cargo or intentionally damaging a ship to prevent greater damage. Go will analyze general average legislation in the Netherlands, particularly the adjudications of the Amsterdam Chamber of Insurance and Average.



### Glenda Goodman

*American Music History* · University of Pennsylvania  
*The Andrew W. Mellon Foundation Fellowships for Assistant Professors*

Glenda Goodman is a historical musicologist who researches early American music. Her new project on Native American music in the era of colonial conquest investigates several modes of musical encounter between Algonquian and Haudenosaunee peoples and English, French, and Dutch colonists in the seventeenth and eighteenth centuries.

## MEMBERS AND VISITORS

**Katja Guenther***History of the Human Sciences* · Princeton University

Katja Guenther is completing a book project on the history of the mirror self-recognition test in the twentieth century. Scientists placed infants, “primitives,” robots, and animals of various kinds in front of mirrors, in order to pose and find new answers to the perennial question, What makes us human?

**Sean Gurd***Classical Sound Studies* · University of Missouri*AMIAS Member*

Sean Gurd is working on a book project on the social ecology of sound in the Mediterranean world between the death of Alexander and the death of Caesar. The project will encompass music, music theory, auditory aesthetics, the physics and physiology of sound, sound design in architecture, and social-environmental auditory interfaces.

**Earle Havens***History of the Book in Early Modern Europe, Digital History* · Johns Hopkins University · *f**Funding provided by the Herodotus Fund*

Earle Havens is writing about historical reading practices in early modern Europe through manuscript annotations preserved in the margins of books. This work explores the adaptation of books and libraries as technologies of information retrieval and memory, building on the digital research collaboration “The Archaeology of Reading in Early Modern Europe.”

**Yuming He***Early Modern Chinese Cultural History* · University of California, Davis · *f**Funding provided by the Patrons' Endowment Fund*

Yuming He is working on a book on the formation of Ming identity as part of global early modernity.

**Maggie Hennefeld***Film and Media Studies* · University of Minnesota*The Andrew W. Mellon Foundation Fellowships for Assistant Professors*

Maggie Hennefeld is writing a book about the history of women who allegedly died from laughing too hard alongside theories of laughter as a clinical symptom of female hysteria. She is focusing on the relationship between female madness and hysterical laughter through archival research on cinema and mass media culture from the late nineteenth and early twentieth centuries.



### Hans Hummer

*Social History of Medieval Europe* · Wayne State University  
George William Cottrell, Jr. Member

Hans Hummer's project examines genealogical thought in Roman late antiquity as an accessory to the reengineering of history by Christian chronographers, and the elaboration of genealogies during the Middle Ages as eschatological maps marking the unfolding of unifying divine plans and promises as Europe fragmented into a conglomerate of kingdoms.

### Carina Johnson

*Early Modern Habsburg Cultural History* · Pitzer College · s  
Hans Kohn Member

Carina Johnson is writing a history of German homefront experiences during the Habsburg-Ottoman Wars. Her project explores the contributions of soldiers and refugees to imperial politics, masculine and Christian identities, the limits of sanctioned violence, and racialized knowledge about the Ottomans from the late fifteenth to the early seventeenth centuries.



### Sylvie Joye

*Early Medieval History, Gender and Family* · Université de Lorraine, Nancy · s  
Funding provided by the Florence Gould Foundation Fund

Sylvie Joye is currently working on a book that examines community, family, and the individual from late antiquity to the beginning of the feudal era. Proceeding from family ties to society at large, it will show how coercion and also care are major interpretative keys to the period.



### Seth Kimmel

*Early Modern Iberian History and Culture* · Columbia University  
John Elliott Member

At IAS, Seth Kimmel will work on his second book project. Drawing on archives from Spain and the wider Mediterranean, the project examines how early modern methods of book collection and cataloguing helped to shape the period's new spatial sense of the world.



### Jeanette Kohl

*Art of the Italian Renaissance* · University of California, Riverside  
Agnes Gund and Daniel Shapiro Member

Jeanette Kohl is an art historian with research interests in early modern Italy, the history of portraiture, and sculpture and materiality. At IAS, she will be working on the first book-length study of bust portraits and their functions and meanings in the Renaissance.



### Thomas Kruse

*Ancient History · Österreichische Akademie der Wissenschaften · s*

*Funding provided by The Gladys Krieble Delmas Foundation and the Herodotus Fund*

Thomas Kruse is an ancient historian and papyrologist whose research focuses on Ptolemaic and Roman Egypt. While at IAS, he will work on an important dossier of Greek papyri that illustrates the history of Egypt at the beginning of the second century C.E.



### Akinobu Kuroda

*Chinese and Global Monetary History · The University of Tokyo*

*Roger E. Covey Member in East Asian Studies*

Akinobu Kuroda is interested in the monetary economy of traditional China, distinctive for its dependency on fragmental coinage, its usage of silver by weight, and for being the earliest to circulate paper money.



### Lydia Liu

*Global History and Modern History · Columbia University*

*Funding provided by The Andrew W. Mellon Foundation*

Lydia Liu is completing a book on the post-World War II transformation of moral concepts across languages, focusing on “human rights.” The book interrogates the boundary between word and concept to tell a new story about how modern ideas emerged in multilingual registers and participated in the struggle for global justice after 1948.



### Scott Lucas

*Islamic Intellectual History · The University of Arizona · f*

Scott Lucas is working on two projects related to Islam in medieval Yemen. The first project seeks to uncover the complex relationship between the Qur’an and Islamic law, while the second one is a history of the unique Zaydi tradition of framing Islamic theology in thirty topics.



### Nathan Martin

*History of Music Theory · University of Michigan*

*Edward T. Cone Member in Music Studies*

Nathan Martin specializes in the history of music theory in Enlightenment France. He is completing his monograph on music theory in the *Encyclopédie*, which treats the intellectual stakes of the reception of the music-theoretical writings of Jean-Philippe Rameau by Rousseau, Condillac, d’Alembert, and Diderot.





### Christian Mauder

*Mamluk Studies, Islamic Intellectual History* · Universität Leipzig  
Gerda Henkel Stiftung Member

Christian Mauder's book project on learning, religion, and rulership at the Mamluk court of Qāniṣawh al-Ghawrī (r. 1501–16) examines for the first time the Egyptian court of the Mamluks as a center of intellectual, religious, and political culture.



### Johannes Pahlitzsch

*Byzantine Studies* · Johannes Gutenberg–Universität Mainz · s  
Funding provided by the Herodotus Fund

Johannes Pahlitzsch intends to work on his book about Byzantium and the Arabic-speaking Middle East. It will cover the multifaceted relations that Byzantium had with the region, including the Orthodox communities under Islamic rule from the emergence of Islam until the collapse of the Byzantine empire in 1453.



### Eric Palazzo

*Medieval Art History, History of Medieval Liturgy* · Université de Poitiers  
Elinor Lunder Founders' Circle Member

Eric Palazzo's current book project investigates the question of movement and energy within the performance of the liturgy and considers the role of medieval visual culture in this process.



### Nikolaos Papazarkadas

*Ancient Greek History, Greek Epigraphy* · University of California, Berkeley · f

Funding provided by the Herodotus Fund

Nikolaos Papazarkadas is planning to continue and finish his ongoing work on the corpus of Theban inscriptions that he has been preparing in collaboration with Yannis Kalliontzis for the *Inscriptiones Graecae* series of the Berlin Academy. In parallel, he will be collaborating with Professor Angelos Chaniotis on the annual bibliographical supplement of Greek inscriptions, *Supplementum Epigraphicum Graecum*.



### Gabriele Pedullà

*Early Modern European Intellectual History, Political Thought* · Università degli Studi Roma Tre · s

Hans Kohn Member

Gabriele Pedullà's project will focus on the rediscovery of classical Athenian politics during the Renaissance in Italy and Europe, from the first translations of Aristotle's *Politics* in Latin (ca. 1260) to Carlo Sigonio's *De republica Atheniensium* (1564).

## MEMBERS AND VISITORS

**Alison Perchuk**

*History of Art and Architecture* · The California State University, Channel Islands

*Friends of the Institute for Advanced Study Member*

Alison Perchuk will be working on a book about topography and sanctity in medieval Italy. This will be an interdisciplinary ecocritical study of art, architecture, and landscapes of Benedictine monasteries, from the sixth to twelfth centuries, that positions landscape as protagonist in the construction of sanctity in the medieval Latin West.

**Cosmin Alin Popa-Gorjanu**

*Medieval Nobility, Social History* · University of Alba Iulia

*Elizabeth and J. Richardson Dilworth Fellow*

Cosmin Popa-Gorjanu is interested in the history of medieval nobility, the development of administrative institutions, and the anti-corruption measures taken in medieval Hungary in the thirteenth and fourteenth centuries.

**Rubina Raja**

*Classical Archaeology* · Aarhus University · s

*Funding provided by the Hetty Goldman Membership Fund*

Rubina Raja's research explores visual culture and urbanism in the ancient world. Raja is studying the largest corpus of Roman-period portraits stemming from one location, namely Palmyra in Syria. These portraits will be the focus of her research at IAS, as they give new insight into the structure of religious life in Palmyra in the first three centuries C.E.

**Michele Salzman**

*Roman History* · University of California, Riverside · f

*Elizabeth and J. Richardson Dilworth Fellow*

Based on new research on papal letters along with epigraphic and textual evidence, Michele Salzman's book project challenges the popular "decline and fall" interpretation of Rome from 270 to 603 C.E. She argues for the creative and competitive engagement of senators, bishops, and generals, which resulted in a collective restoration of the city in response to crises.

**Dagmar Schaefer**

*History of Science in China* · Max-Planck-Institut für Wissenschaftsgeschichte · s

*Funding provided by the Hetty Goldman Membership Fund*

Dagmar Schaefer's research project studies the changing nature of knowing silk in premodern China. Over a long period, the domesticated silkworm, the fiber, and the fabric developed almost exclusively in this region of the world. Does materiality—such as the sociotechnical complex of silk—affect scientific and technological development?



### Eric Schluessel

*Early Modern Chinese and East Asian History* · University of Montana  
*The Andrew W. Mellon Foundation Fellowships for Assistant Professors*

Eric Schluessel's work explores the social and cultural history of China and Central Asia in the nineteenth and early twentieth centuries. His project at IAS focuses on how transregional Chinese and South Asian merchant networks shaped regional material culture in Xinjiang (Eastern Turkestan) at the turn of the century.



### Brian Steininger

*Japanese History* · Princeton University · *f*  
*The Starr Foundation East Asian Studies Endowment Fund Member*

Brian Steininger is examining media practices of scholarship in thirteenth- and fourteenth-century Japan—the interrelation between technologies of inscription, book circulation, and knowledge production. An important component of this story is (xylographic) print, both locally produced and imported, whose relationship to the broader manuscript culture needs to be better understood.



### Seiichi Suzuki

*Anglo-Saxon and Carolingian Studies* · Kansai Gaidai University

A comparative Germanic linguist and philologist and an early medieval archaeologist, Seiichi Suzuki is writing a book on the meter and pictures of the Old English Genesis, “MS Junius 11.” This philological and art-historical work aims to reconstruct an early West Saxon Genesis and a West Frankish Genesis as predecessors of the Junius manuscript.



### Tommaso Tesei

*Late Antiquity, the Qur'an, Early Islam* · Van Leer Jerusalem Institute  
*Patricia Crone Member*

Thematically, Tommaso Tesei's academic interests mostly center on the emergence of the Islamic movement and faith tradition in the historical context of the late antique Middle East. His recent research explores the questions of ideology, imperialism, and propaganda in Byzantine, Sasanian, and early Islamic societies.



### Pier Mattia Tommasino

*Early Modern Europe and the Muslim World* · Columbia University  
*Infosys Member*

At IAS, Pier Mattia Tommasino plans to write a book on Orientalism, science, and philology in seventeenth-century Florence, which he likes to describe as an exercise in microhistory and world philology. It will explore the role of Oriental studies among Galileo's students between 1666 and 1711.

## MEMBERS AND VISITORS

### Noa Turel

*Late Medieval and Renaissance Art History* · University of Alabama at Birmingham · s

*Funding provided by the Herodotus Fund*

Noa Turel's book project is focused on painter-engineers in French and Italian Renaissance courts and their role in engendering Europe's self-perception as a technological civilization. Initially trading on the aura of machines, then associated with the Islamic world, as exotic and wondrous, painters facilitated Europe's global exploration and, eventually, hegemony.



### Karina Urbach

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

Karina Urbach is researching intelligence sources (Counterintelligence Corps) regarding Central Europe. She is also following the trail of an Austrian refugee from the 1930s onwards.



### Maartje van Gelder

*Early Modern Venice* · University of Amsterdam · s

*Felix Gilbert Member*

Maartje van Gelder is working on early modern contentious politics and social unrest. Her project challenges Venice's reputation for exceptional political serenity and argues that ordinary Venetians did shape politics in this aristocratic republic. However, their impact has been systematically "forgotten," thus effectively removing them from the political stage.



### Nükhet Varlık

*Ottoman History, History of Plague* · Rutgers, the State University of New Jersey, and New Jersey Institute of Technology

*Funding provided by the Fund for Historical Studies*

Nükhet Varlık is a historian of the Ottoman Empire interested in disease, medicine, and public health. Her current book project on empire, ecology, and plague during the Second Pandemic (ca. 1340s–1840s) examines the five-hundred-year Ottoman plague experience in a global ecological context.



### Louise Young

*Modern Japanese History* · University of Wisconsin–Madison · f

*Funding provided by the Fund for Historical Studies*

While military defeat in World War II signaled the end of formal empire in Asia, Japan reestablished many of the economic relationships that had constituted the basis of its colonial empire prior to 1945 as it rebuilt. Louise Young's project at IAS examines regional geopolitics and the impact of Japanese power in Asia across the twentieth century.



**Maria Youni**

*History of Ancient Law, Greek Epigraphy* · Democritus University of Thrace

*Willis F. Doney Member*

Maria Youni is currently studying the impact of the application of Roman law and its interaction with local law in the Roman province of Macedonia (late second century B.C.E. to early fourth century C.E.). In addition, she is working on a reappraisal of the penalty of *atimia* in classical Athens.



## 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 2018–19 academic year, the School will have a special program on Variational Methods in Geometry. Fernando Codá Marques of Princeton University will be the 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 number theory, including a complete solution of Vinogradov's theorem in analytic number theory after more than eighty years. In Hamiltonian dynamics, he developed the theory of invariant Gibbs measures and quasi-periodicity for the Schrödinger equation.



### Camillo De Lellis

*Professor*

A world-renowned geometric analyst with broad expertise in the calculus of variations, geometric measure theory, and fluid dynamics, Camillo De Lellis has contributed profoundly to central problems of analysis and geometry. His use of modern tools and innovative approaches in examining fundamental questions in the field have resulted in new and monumental insights that have advanced understanding within the mathematical community.



### 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."

## FACULTY

**Peter Sarnak***Professor*

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

**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.

**Akshay Venkatesh***Professor*

Akshay Venkatesh is a mathematician who has worked on many topics at the interface between number theory and other fields, including representation theory, dynamics, and algebraic topology. His recent work examines new algebraic structures related to the topology of locally symmetric spaces.



### Avi Wigderson

*Herbert H. Maass Professor*

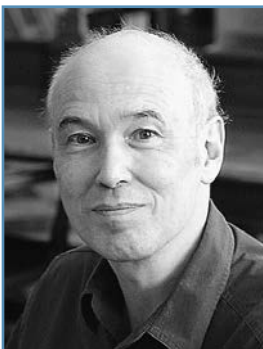
Avi Wigderson is a widely recognized authority in the diverse and evolving field of theoretical computer science. His main research area is computational complexity theory. This field studies the power and limits of efficient computation and is motivated by such fundamental scientific problems as: Does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



### Enrico Bombieri

*Professor Emeritus*

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



### Pierre Deligne

*Professor Emeritus*

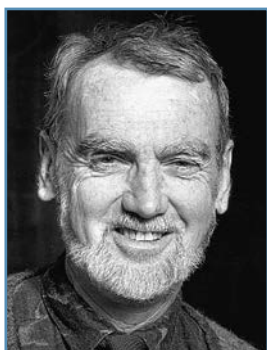
Pierre Deligne is known for his work in algebraic geometry and number theory. He pursues a fundamental understanding of the basic objects of arithmetical algebraic geometry—motive, L-functions, Shimura varieties—and applies the methods of algebraic geometry to trigonometrical sums, linear differential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



### Phillip A. Griffiths

*Professor Emeritus*

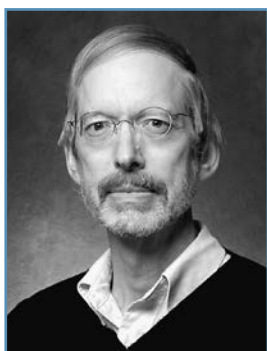
Phillip Griffiths initiated with his collaborators the theory of variation of Hodge structure, which has come to play a central role in many aspects of algebraic geometry and its uses in modern theoretical physics. In addition to algebraic geometry, he has made contributions to differential and integral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



### Robert P. Langlands

*Professor Emeritus*

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

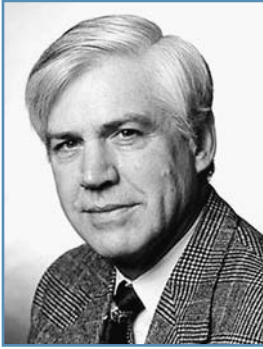


### Robert MacPherson

*Professor Emeritus*

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.



**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.



### Daniel Alvarez-Gavela

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

Daniel Alvarez-Gavela's interests lie broadly in symplectic and contact topology, singularity theory, parametrized Morse theory, and h-principles. A focus of past and present work concerns the use of flexible techniques to establish various results on the simplification of singularities of Lagrangian and Legendrian fronts, as well as exploring applications of these results.



### Lucas Coelho Ambrozio

*Geometric Analysis* · University of Warwick  
*Funding provided by the Ambrose Monell Foundation*

Lucas Coelho Ambrozio's research will focus on the classification problem for static manifolds, the construction of new free boundary minimal surfaces in the unit ball, and understanding how the minimal hypersurfaces obtained by general min-max methods look and what they can be used for. Broadly speaking, geometric variational problems are his main research interest.



### 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.



### Costante Belletini

*Geometric Analysis* · Institute for Advanced Study and Princeton University · *s*  
*Funding provided by the National Science Foundation*

Costante Belletini works in geometric analysis with special emphasis on regularity questions arising in the calculus of variations and in calibrated geometry, often using methods from geometric measure theory and partial differential equations. He is particularly interested in the impact of such regularity results on questions arising in differential geometry.



### Jacob Bernstein

*Geometric Analysis* · Johns Hopkins University · *s*  
*Funding provided by the Charles Simonyi Endowment*

Jacob Bernstein is primarily interested in minimal surfaces theory and the mean curvature flow.


**Irina Bobkova**

*Algebraic Topology, Homotopy Theory* · Institute for Advanced Study · *f, v/s*  
*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

Nathaniel Bottman studies methods for relating the Fukaya categories of different symplectic manifolds. At IAS, he intends to continue his recent efforts to compute how the Fukaya category changes when one takes a symplectic quotient.


**Barney Bramham**

*Symplectic Geometry, Hamiltonian Dynamics* · Institute for Advanced Study · *vnf*

*Funding provided by the National Science Foundation*

At IAS, Barney Bramham is working on low-dimensional Hamiltonian systems—integrable features when entropy vanishes, also symbolic dynamics, using variational methods from symplectic topology—and on the contact systolic ratio.


**Alina Ioana Bucur**

*Number Theory* · Institute for Advanced Study · *vnf*

Alina Ioana Bucur works in arithmetic statistics, the study of number-theoretic objects in aggregates, rather than in isolation. Currently, she is focused on effective bounds on the distribution of Frobenius eigenvalues of abelian varieties over number fields, and the behavior of L-functions of families of curves of varying genus over a fixed finite field.


**Clark W. Butler**

*Dynamical Systems* · Princeton University · *vri*

Clark Butler's research focuses on the properties of the Lyapunov spectrum associated with an Anosov diffeomorphism. His primary project while at IAS will be to extend continuity and simplicity of spectrum results from a special class of these diffeomorphisms to an open and dense subset of all Anosov diffeomorphisms.

## MEMBERS AND VISITORS



### Guher Camliyurt

*Partial Differential Equations* · Institute for Advanced Study  
Funding provided by the Ambrose Monell Foundation and the National Science Foundation

Guher Camliyurt works on the partial differential equations arising in incompressible fluid dynamics such as the Navier–Stokes and the Euler equations, focusing on the analyticity and Gevrey regularity properties. A large part of her research also addresses unique continuation problems for general elliptic and parabolic equations.



### Alessandro Carlotto

*Geometric Analysis* · Eidgenössische Technische Hochschule Zürich  
Funding provided by the Giorgio and Elena Petronio Fellowship Fund and the National Science Foundation

Alessandro Carlotto works at the interface of differential geometry, nonlinear analysis, and mathematical physics. His research interests include the Einstein constraint equations, scalar curvature rigidity and flexibility phenomena, and global aspects of the theory of minimal subvarieties.



### Dawei Chen

*Algebraic Geometry, Teichmüller Dynamics* · Boston College · *vnf, s*  
Funding provided by the Charles Simonyi Endowment

Dawei Chen is interested in the geometry of moduli spaces and applications to related fields. His recent research focuses on moduli of differentials and Teichmüller dynamics.



### Gao Chen

*Geometry* · Institute for Advanced Study  
Funding provided by the S. S. Chern Foundation for Mathematics Research Fund and the National Science Foundation

Gao Chen's fields of interest are the complex (Kähler) geometry, quaternionic (hyperkähler) geometry, and octonionic ( $G_2$  and  $\text{Spin}(7)$ ) geometry.



### Otis Chodosh

*Geometric Analysis* · Institute for Advanced Study and Princeton University · *vi*

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.



### 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.

### Yaim Cooper

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

*Funding provided by the National Science Foundation*

Yaim Cooper aims to combine techniques from enumerative geometry and infinite dimensional representation theory to produce better formulas for calculating the number of curves satisfying certain conditions in  $\mathbb{P}^2$  and related spaces.



### Benjamin G. Dodson

*Dispersive Partial Differential Equations* · Johns Hopkins University · *vnf*

*Minerva Research Foundation Member*

Benjamin Dodson is interested in dispersive partial differential equations, mainly nonlinear Schrödinger and wave equations. His research deals mainly with long-time behavior of such solutions with data at a critical regularity, whether or not an initial value problem has a solution for all time.



### Celso dos Santos Viana

*Differential Geometry* · University College London

*Funding provided by the National Science Foundation*

Celso dos Santos Viana's research interests include differential geometry and partial differential equations, with a focus on variational methods on geometric problems. He has recently been interested in classification problems related to the geometry and topology of isoperimetric and index one minimal surfaces. He is also interested in geometric flows, in particular MCF.



### Shai Evra

*Representation Theory* · The Hebrew University of Jerusalem

*Funding provided by the National Science Foundation*

Shai Evra's current research concerns symmetric spaces of arithmetic groups and their combinatoric, geometric, and topological structure. A main goal is proving that these objects display expander-like properties. In order to study such objects, he employs results from representation and number theory (e.g. Ramanujan and Langlands conjectures).

## MEMBERS AND VISITORS



### Simion Filip

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

Simion Filip is interested in the interactions between dynamical systems, especially dynamics on locally homogeneous spaces, and algebraic geometry, especially Hodge theory and complex geometry.



### David M. Fisher

*Rigidity in Dynamics and Geometry* · Indiana University · *f*  
*Funding provided by the Simons Foundation*

David Fisher studies discrete subgroups of Lie groups with a focus on related rigidity phenomena. At IAS, he is focusing on rigidity of actions of higher rank lattices, totally geodesic hypersurfaces in real and complex hyperbolic spaces, and constructions of expanders and superexpanders.



### Francesc Fité

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

Francesc Fité is interested in the arithmetic of abelian varieties over number fields. His research is concerned with the equidistribution properties of the Frobenius elements in their cohomology, as well as the special values of their L-functions and the connections to modularity.



### Amanda L. Folsom

*Number Theory* · Amherst College · *vmf, s*  
*Funding provided by the Charles Simonyi Endowment*

Amanda Folsom specializes in number theory, particularly modular and mock modular forms, harmonic Maass forms, q-series, Jacobi forms, and related objects. In particular, she is interested in applications to number theory and combinatorics.



### Ailana Fraser

*Geometric Analysis* · University of British Columbia  
*Funding provided by the James D. Wolfensohn Fund and the National Science Foundation*

Ailana Fraser is interested in applications of minimal surface methods to geometric and topological problems, including extremal eigenvalue problems and sharp eigenvalue estimates for surfaces, min-max minimal surface theory, free boundary minimal surfaces, and positive isotropic curvature.





### Brian Freidin

*Mathematics* · Brown University · *v*

*Funding provided by the Charles Simonyi Endowment*

Brian Freidin is interested in harmonic maps, especially those with singular domains or targets, and their applications to Teichmüller theory and problems of rigidity.



### Mika Göös

*Computational Complexity Theory* · Institute for Advanced Study

*Funding provided by the National Science Foundation*

Mika Göös is interested in impossibility phenomena in mathematics: Gödel's Incompleteness Theorems, Turing's uncomputability results, and the P versus NP conjecture. The goal of his research in computational complexity theory is to discover new sources of impossibility by proving unconditional lower bounds on the amount of computational resources required to solve a given computational problem.



### 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.



### Qi'an Guan

*Complex Variables* · Peking University · *f*

*Funding provided by the Ky Fan and Yu-Fen Fan Membership Fund and the National Science Foundation*

Qi'an Guan is interested in the properties of multiplier ideal sheaves related to plurisubharmonic functions and the problems related to the  $L^2$  extension theorem.



### Michael Hochman

*Mathematics* · The Hebrew University of Jerusalem · *vnf*

*Funding provided by the National Science Foundation*

Michael Hochman's research interests include ergodic theory and dynamical systems, dimension theory, fractal geometry, and additive combinatorics.



### Umberto Leone Hryniewicz

*Symplectic Dynamics* · Universidade Federal do Rio de Janeiro · *vnf*  
*Friends of the Institute for Advanced Study Member*

Umberto Leone Hryniewicz is interested in applications of methods from Morse theory and symplectic topology to the study of Hamiltonian systems in the large. Existing applications include periodic orbits, global cross-sections, or homo/heteroclinic connections. He is also interested in studying sharp systolic inequalities via symplectic methods.



### Lan-Hsuan Huang

*Differential Geometry* · University of Connecticut · *vnf*

Lan-Hsuan Huang's research focuses on geometric problems that arise naturally from mathematical relativity. She studies the connections among scalar curvature, Einstein constraint equations, minimal surfaces, constant mean curvature surfaces, and variational features of geometric invariants.



### 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.



### Yash Jhaveri

*Partial Differential Equations and Geometric Measure Theory*  
 Eidgenössische Technische Hochschule Zürich  
*Funding provided by the National Science Foundation*

Yash Jhaveri is interested in studying connections between fully non-linear partial differential equations and geometric measure theory (area minimizing currents), and how regularity or singularity properties of one affect regularity or singularity properties of the other.



### Qingyuan Jiang

*Algebraic Geometry* · The Chinese University of Hong Kong  
*Shing-Shen Chern Member; additional funding by the National Science Foundation*

Qingyuan Jiang's research area is the study of derived categories of algebraic varieties, which can be viewed as a noncommutative extension of the classical study of algebraic geometry. More concretely, he works on homological projective duality, categorification of projective geometry, CY categories, and the behavior of derived categories under flops and flips.



### Nicolaos Kapouleas

*Differential Geometry and Geometric Analysis* · Brown University · *f*

Nicolaos Kapouleas is currently working on gluing constructions for minimal surfaces and other geometric objects, and on related characterization and classification questions.



### Mikhail Kapranov

*Algebra, Algebraic Geometry, Category Theory* · Kavli Institute for the Physics and Mathematics of the Universe, University of Tokyo · *vp*

Mikhail Kapranov is currently working on several projects including categorical analogs of perverse sheaves and the relation of secondary polytopes to mathematical structure of quantum field theories.

### Kiran Kedlaya

*Number Theory, Arithmetic Geometry* · University of California, San Diego · *vp*

Kiran Kedlaya's research is centered on applications of p-adic analysis to the study of algebraic varieties. Areas of focus include p-adic differential equations, perfectoid spaces, and algorithms for computing zeta and L-functions.



### Daniel J. Ketover

*Geometric Analysis* · Princeton University · *f, v/s*

*Funding provided by the Charles Simonyi Endowment*

Daniel Ketover's research focuses on variational methods and minimal surfaces.



### Ilya Khayutin

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

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.



### Swastik Kopparty

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

Swastik Kopparty is interested in the theory of computing, error-correcting codes, complexity theory, combinatorics, finite fields, and randomness and pseudorandomness.



### Clemens Koppensteiner

*Geometric Representation Theory* · Institute for Advanced Study  
Funding provided by the National Science Foundation

Clemens Koppensteiner is focusing on understanding structures of derived categories of sheaves in algebraic geometry, and particularly 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 and Princeton University

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.



### Maitreyee Chandramohan Kulkarni

*Combinatorics* · Institute for Advanced Study · *v*  
Funding provided by the Charles Simonyi Endowment

Maitreyee Kulkarni has research interests in categorification of cluster algebras and dimer models. She has worked on a combinatorial model for categorification of cluster structure on double Bruhat cells. At IAS, she plans to work on Poisson geometry and its relation to cluster algebras.



### Thomas Lam

*Combinatorics* · University of Michigan · *vnpf*  
Ralph E. and Doris M. Hansmann Member

Thomas Lam studies algebraic combinatorics and its interactions with representation theory, algebraic geometry, and mathematical physics.



### Lionel Levine

*Probability* · Cornell University · *vnf*  
*Funding provided by the Charles Simonyi Endowment*

Lionel Levine's research aims to understand how and why large-scale patterns emerge from simple local rules. At IAS, he plans to work on a theory of multiscale limits for particle systems with two or more interacting time and length scales. He will also study proof systems and computational complexity.



### Chao Li

*Geometric Analysis* · Stanford University · *v*

Chao Li's research interests include differential geometry and geometric analysis, with a focus on geometric variational problems. He is particularly interested in the study of minimal surfaces—their existence and regularity questions—and via them, questions in intrinsic curvature, topology, and mathematical physics.



### Elon Lindenstrauss

*Homogeneous Dynamics, Ergodic Theory, Additive Combinatorics* · The Hebrew University of Jerusalem · *f*  
*Funding provided by the National Science Foundation*

Homogeneous dynamics are a concrete class of dynamical systems with intimate connections to arithmetic, Diophantine approximations, and automorphic forms. While at IAS, Elon Lindenstrauss plans to study these systems and their interplay with (mostly analytic) number theory, with special emphasis on higher rank diagonalizable actions and quantitative aspects.



### Yevgeny Liokumovich

*Geometric Analysis* · Massachusetts Institute of Technology

Yevgeny Liokumovich's research focuses on problems in Almgren-Pitts min-max theory, quantitative topology, and metric geometry.



### Daniel Litt

*Algebraic and Arithmetic Geometry* · University of Georgia  
*Funding provided by The Bell Companies Fellowship Fund*

Daniel Litt is studying Galois actions on fundamental groups of algebraic varieties and on representations of fundamental groups of curves over finitely generated fields. He is particularly interested in concrete applications to algebraic geometry and number theory: for example, to the geometric torsion conjecture and to Iwasawa theory.



### Francesco Maggi

*Calculus of Variations and Geometric Measure Theory* · The University of Texas at Austin · *s*

*Funding provided by the Charles Simonyi Endowment*

Francesco Maggi's work is in the broad area of the calculus of variations and of geometric measure theory. He is interested in variational problems of geometric character motivated by physical applications—such as liquid droplets, soap films, and material or cellular membranes—and in the quantification of rigidity theorems in geometry and analysis.



### Viswambhara Makam

*Invariant Theory, Computational Complexity* · Institute for Advanced Study

*Funding provided by the National Science Foundation*

Viswambhara Makam is interested in invariant theory, representation theory, complexity, and tensors. More specifically, he is interested in approaching problems in arithmetic complexity and tensors via techniques from invariant theory and representation theory.



### Eugenia Malinnikova

*Harmonic Analysis, Partial Differential Equations* · Norwegian University of Science and Technology · *vnf*

*Funding provided by the National Science Foundation*

Eugenia Malinnikova's research interests include potential theory, classical and discrete elliptic partial differential equations, and uncertainty principles.



### Fernando Codá Marques

*Geometry* · Princeton University · *dvp*

*Funding provided by the Oswald Veblen Fund*

Fernando Codá Marques is interested in mathematical problems in the interface between geometry and analysis. At IAS, he plans to continue his investigation of the variational theory of minimal submanifolds and applications. One aim is to develop a good Morse-theoretic understanding of the space of minimal varieties in Riemannian manifolds.



### Ángel D. Martínez Martínez

*Mathematics* · Universidad Autónoma de Madrid

*Funding provided by the National Science Foundation*

Ángel D. Martínez Martínez's research interests belong to the realm of harmonic analysis, partial differential equations, differential geometry, and number theory.





### Jacob Matherne

*Geometric Representation Theory, Combinatorics, Cluster Algebras*  
Institute for Advanced Study

*AMIAS Member; additional funding provided by the National Science Foundation*

Jacob Matherne is interested in the interplay among geometry, representation theory, and combinatorics. This has included, for certain quiver representations, a combinatorial description of exceptional sequences and of the Fourier-Sato transform (for perverse sheaves). At IAS, he will investigate the Kazhdan-Lusztig theory of matroids via Hodge theory.



### Davi Maximo

*Mathematics* · University of Pennsylvania · *v*

Davi Maximo is interested in nonlinear methods in differential geometry, partial differential equations, and geometric topology.



### William H. Meeks III

*Differential Geometry* · University of Massachusetts · *f*

William Meeks works primarily on the geometry and uniqueness of minimal and constant mean curvature surfaces in three-dimensional Riemannian geometry.



### Marco Aurelio Mendez Guaraco

*Geometric Analysis* · Institute for Advanced Study · *f*  
*Funding provided by the National Science Foundation*

Marco Aurelio Mendez Guaraco is interested in the analogies between variational problems in geometry and elliptic functionals from the theory of partial differential equations. Specifically, he is working on the relations between minimal hypersurfaces and the theory of phase transitions.



### Govind Menon

*Applied Mathematics* · Brown University  
*Funding provided by the Charles Simonyi Endowment*

Govind Menon is interested in mathematical results that shed light on turbulence. Surprising findings of De Lellis and Szekelyhidi show that turbulence is tied to foundational results in geometry, in particular to Nash's approach to the isometric embedding problem for Riemannian manifolds. Menon wishes to turn this around and use statistical physics to improve Nash's work.

## MEMBERS AND VISITORS

**Karola Meszaros**

*Algebraic Combinatorics, Discrete Geometry* · Cornell University · *vnf*  
*Friends of the Institute for Advanced Study Member*

The overarching theme of Karola Meszaros's current research is to develop a new perspective on classical multivariate polynomials by recasting them in terms of polytopes. Recent work with collaborators shows a close connection between flow polytopes, generalized permutahedra, and Schubert polynomials, thereby bringing new ideas to study these and related polynomials.

**Dor Yosef Minzer**

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

Dor Minzer's main research interests are in computational complexity theory, probabilistically checkable proofs, and analysis of Boolean functions.

**Shay Moran**

*Machine Learning* · Institute for Advanced Study · *v*

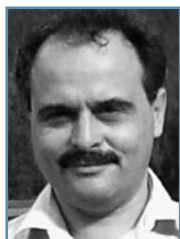
Shay Moran's interests lie in the spectrum between mathematics and computer science, including combinatorics, geometry, information theory, machine learning, statistics, and complexity theory.

**Guy Moshkovitz**

*Combinatorics and Theoretical Computer Science* · Institute for Advanced Study

*Funding provided by the National Science Foundation*

Guy Moshkovitz's fields of interest include extremal combinatorics, graph and hypergraph theory, Ramsey theory, and their applications to theoretical computer science (e.g., circuit complexity).

**Alexander Nabutovsky**

*Riemannian Geometry* · University of Toronto · *s*  
*Funding provided by the Charles Simonyi Endowment*

Alexander Nabutovsky's research interests include quantitative aspects of the geometric calculus of variations (including the length of the shortest periodic geodesic and related problems, as well as variational problems for functionals on the space of Riemannian metrics and similar moduli spaces), global geometry of spaces of triangulations, and quantitative and algorithmic aspects of topology of manifolds.



### Robin Neumayer

*Calculus of Variations* · Institute for Advanced Study  
Funding provided by the National Science Foundation

Robin Neumayer works in the calculus of variations and elliptic partial differential equations, with a primary emphasis on isoperimetric problems and functional and geometric inequalities. Much of her current research focuses on the interplay between functional inequalities and the geometry of Riemannian manifolds.



### Andre Neves

*Geometric Analysis* · The University of Chicago · *f*  
Funding provided by the Charles Simonyi Endowment

Andre Neves is interested in the relation between minimal surfaces, curvature of the ambient manifold, and topology.



### Yaron Ostrover

*Symplectic Geometry, Hamiltonian Dynamics* · Tel-Aviv University · *vnf*

Yaron Ostrover is currently interested in the theory of symplectic measurements, computational aspects of symplectic capacities, and the interaction between symplectic geometry and asymptotic geometric analysis.



### Toniann Pitassi

*Computational Complexity, Proof Theory* · University of Toronto · *vp, s*  
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.



### Philippe Rigollet

*Statistics, Machine Learning* · Massachusetts Institute of Technology · *vp, s*  
Funding provided by Eric and Wendy Schmidt

Philippe Rigollet works at the intersection of statistics, machine learning, and optimization, focusing primarily on the design and analysis of statistical methods for high-dimensional problems. His recent research focuses on geometric data analysis using tools from optimal transport.

## MEMBERS AND VISITORS



### Tristan Rivière

*Partial Differential Equations in Geometry and Physics* · ETH Zürich · *s*  
*Funding provided by the Florence Gould Foundation Fund*

Tristan Rivière's research interests include analysis of partial differential equations arising in physics and geometry; calculus of variations; geometric analysis; application of geometric measure theory to partial differential equations; and the geometry of structures of singularities, shock, and defects for weak solutions to elliptic, parabolic, and hyperbolic partial differential equations.



### Robert Robere

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

Robert Robere is working on computational complexity theory, which is the study of computational resources (such as running time or memory) and their use in solving computational problems. He is particularly interested in proving lower bounds in circuit complexity, proof complexity, and related topics.



### Regina Rotman

*Riemannian Geometry* · University of Toronto · *s*

Regina Rotman's research interests include geometric inequalities, periodic geodesics and minimal surfaces on compact and non-compact manifolds, geodesic nets, and width of homotopies.



### Shubhangi Saraf

*Theoretical Computer Science and Discrete Mathematics* · Institute for Advanced Study · *s*

Shubhangi Saraf is interested in all areas of theoretical computer science and discrete mathematics. Her research has focused on complexity theory, algebraic computation, error correcting codes, and discrete geometry.



### Richard Schoen

*Differential Geometry, General Relativity, Partial Differential Equations* · Stanford University

Richard Schoen is known for his contributions to geometric analysis and the understanding of the interconnectedness of partial differential equations and differential geometry.



### Yakov G. Sinai

*Dynamical Systems* · L. D. Landau Institute for Theoretical Physics, Moscow and Princeton University

At IAS, Yakov G. Sinai is planning to work on two main areas: first, mathematical problems related to the Navier-Stokes system; and second, spectral properties of systems of ordinary differential equations on two-dimensional tori.



### Sahil Singla

*Theoretical Computer Science* · Carnegie Mellon University ·  $\nu$

Sahil Singla is interested in theoretical problems related to the theme of “optimization under uncertainty.” Currently, he is working on combinatorial optimization problems, and his uncertainty models are inspired from areas such as online and approximation algorithms, machine learning theory, stochastic processes, and algorithmic game theory.



### Christina Sormani

*Geometric Analysis, Metric Geometry, General Relativity* · The City University of New York ·  $\nu$

Christina Sormani studies and develops notions of convergence for Riemannian manifolds and applies them to questions arising naturally in geometric analysis and general relativity. Currently, she is investigating manifolds with scalar curvature bounds and their intrinsic flat limits. In the past, she has studied Gromov-Hausdorff limits of manifolds with Ricci curvature bounds.



### Katepalli Sreenivasan

*Mathematical Physics* · The Abdus Salam International Centre for Theoretical Physics, Trieste

*Funding provided by the Charles Simonyi Endowment*

Katepalli Sreenivasan's research interests include fluid mechanics and turbulence, nonlinear and nonequilibrium phenomena, cryogenic helium, and stellar physics.



### 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.



### Raphael Sebastian Steiner

*Analytic Number Theory* · Institute for Advanced Study  
*Funding provided by the Giorgio and Elena Petronio Fellowship Fund II and the National Science Foundation*

Raphael Sebastian Steiner is currently working on intrinsic Diophantine approximation on lower-dimensional spheres. To this end, he combines tools from the theory of automorphic forms, harmonic analysis, and the circle method.



### Sara Tukachinsky

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

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



### Olga Turanova

*Partial Differential Equations* · University of California, Los Angeles · *v*  
*Funding provided by the Charles Simonyi Endowment*

Olga Turanova studies partial differential equations. Her focus is on nonlinear PDEs, including reaction-diffusion equations and free boundary problems. She is interested in qualitative properties of solutions, such as regularity and asymptotic behavior.



### Remy van Dobben de Bruyn

*Algebraic Geometry and Arithmetic Geometry* · Columbia University · *vri*

Remy van Dobben de Bruyn's work focuses on geometric, arithmetic, and cohomological properties of varieties in positive and mixed characteristic. His work is inspired by the motivic and anabelian programs, with a particular interest in finite fields.



### Franco E. Vargas Pallete

*Low-dimensional Geometry and Topology* · University of California, Berkeley  
*Minerva Research Foundation Member*

Franco E. Vargas Pallete is interested in low dimensional geometry and topology, specifically 3-manifold topology and hyperbolic geometry. At IAS, he will explore the connections of hyperbolic geometry with minimal surface theory.





### Saraswathi Venkatesh

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

Sara Venkatesh is interested in symplectic geometry and mirror symmetry. She studies Floer theories that capture local information on open symplectic manifolds. At IAS, she plans to use Floer theory and mirror symmetry to explore questions in quantitative symplectic geometry and contact dynamics.



### Preston Wake

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

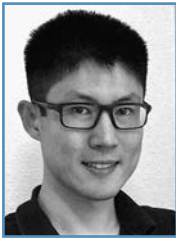
Preston Wake studies congruences between modular forms, Galois deformation theory, and Iwasawa theory.



### Lu Wang

*Geometric Analysis* · University of Wisconsin–Madison · *vnf*  
*Zurich Financial Services Member*

Lu Wang's primary research interest is geometric analysis with an emphasis on geometric flows, including mean curvature flow and Ricci flow, as well as their applications.



### Sida Wang

*Machine Learning, Natural Language Processing* · Institute for Advanced Study  
*Funding provided by Eric and Wendy Schmidt*

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.



### Neshan Wickramasekera

*Geometric Analysis* · University of Cambridge · *s*  
*Funding provided by the Charles Simonyi Endowment*

Neshan Wickramasekera works in the general area of geometric analysis. His research includes contributions to the regularity theory of minimal and related submanifolds, to the asymptotic analysis of their singularities including branch points, and to a partial differential equation-based theory for embedded minimal hypersurfaces and branched minimal immersions.

**Jakub Witaszek***Algebraic Geometry* · Institute for Advanced Study ·  $f$ *Funding provided by the National Science Foundation*

Jakub Witaszek's main topics of research are birational geometry, algebraic geometry in positive characteristic, and Frobenius splittings. At IAS, he would like to study birational geometry in mixed characteristic.

**Damin Wu***Differential Geometry* · University of Connecticut*Funding provided by the Charles Simonyi Endowment*

Damin Wu is interested in differential geometry and its connections to complex function theory, partial differential equations, algebraic geometry, topology, and number theory.

**Jiaxian Wu***Geometric Analysis, Hodge Theory* · Nanjing University of Science and Technology ·  $v, f$ 

Jiaxian Wu's research concerns geometric analysis, with a current focus on Hodge theory. He is interested in all aspects of algebraic geometry, Hodge theory, and representation theory.

**Umberto Zannier***Diophantine Geometry, Algebraic Points on Transcendental Varieties* · Scuola Normale Superiore di Pisa ·  $v, s$ 

Umberto Zannier's interests include Diophantine geometry, relative Manin-Mumford, distribution of torsion values of sections in abelian schemes, specialization problems, Hilbert property, and integral points.

**Richard Zemel***Machine Learning* · University of Toronto ·  $v, s$ *Funding provided by Eric and Wendy Schmidt*

Richard Zemel 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; 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.

**Zhiyuan Zhang**

*Ergodic Theory and Dynamical Systems* · KTH Royal Institute of Technology, Stockholm

*Funding provided by the National Science Foundation*

Zhiyuan Zhang's research is in ergodic theory and dynamical systems. He is working on some problems related to the ergodicity of differentiable dynamical systems, as well as some problems on Reeb flow dynamics.

**Zihui Zhao**

*Harmonic Measure, Geometric Measure Theory* · Institute for Advanced Study

*Funding provided by the National Science Foundation*

Zihui Zhao studies the properties of harmonic and elliptic measures, and particularly their interplay with the geometry of domains and the solvability of corresponding partial differential equations. She is also interested in free boundary problems and the theory of minimal surfaces.

**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.

**Xin Zhou**

*Geometric Analysis, General Relativity* · University of California, Santa Barbara

*Funding provided by the National Science Foundation*

Xin Zhou is interested in minimal surface theory and general relativity. He plans to continue the development of min-max theory for minimal and prescribed mean curvature surfaces and for minimal surfaces with free boundary.

**Zhengyi Zhou**

*Symplectic Geometry* · Institute for Advanced Study

*Funding provided by the National Science Foundation*

Zhengyi Zhou is interested in constructing Morse-Bott and equivariant theories in symplectic geometry and polyfold theory. At IAS, he plans to continue work on Morse-Bott and equivariant theories and use them to study symplectic topology and dynamics.

## MEMBERS AND VISITORS

**Jonathan Julian Zhu***Geometric Analysis* · Institute for Advanced Study · *v*

Jonathan Zhu is interested in the development and application of minimal surface theory and geometric flows. He intends to continue the study of min-max theory for minimal and prescribed mean curvature surfaces.

**Jeroen Zuiddam***Algebraic Complexity, Combinatorics, Quantum Information* · Centrum Wiskunde & Informatica · *v**Funding provided by the National Science Foundation*

Jeroen Zuiddam works on problems in algebraic complexity theory, tensor theory, and combinatorics, with methods from representation theory, algebraic geometry, and quantum information theory. A current topic of interest is the theory of asymptotic spectra in the context of tensors, graphs, and other suitable semirings.

# 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.

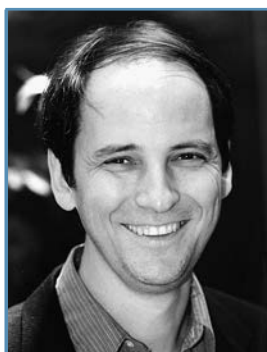
Areas of current interest in theoretical physics include elementary particle physics, particle phenomenology, string theory, quantum theory, and quantum gravity, and their relationship to geometry, theoretical and observational astrophysics, and cosmology. The astrophysics group combines theory with 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.

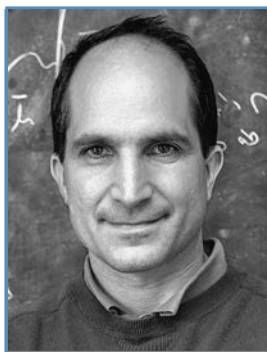
## FACULTY

**Nima Arkani-Hamed***Professor · Particle Physics*

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

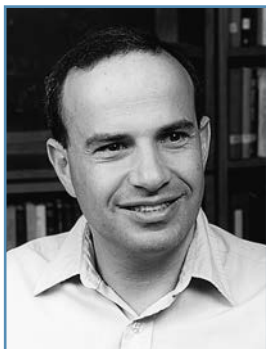
**Stanislas Leibler***Professor · Biology*

Stanislas Leibler has made 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. He has made deep contributions to the understanding of the dynamics of quantum field theories, especially two-dimensional conformal field theories and supersymmetric quantum field theories. His exact solutions of supersymmetric systems have uncovered many new and unexpected phenomena, including the fundamental role of electric-magnetic duality in these theories. These exact solutions have led to many applications in physics and in mathematics. Recently, he combined insights from his earlier work to shed new light on quantum field theories in three space-time dimensions, which are also of interest to condensed matter physics.

**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*

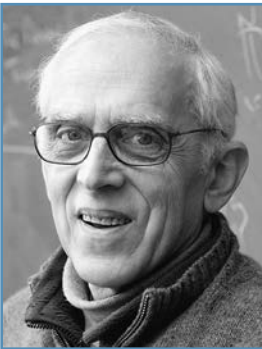
Edward Witten's work exhibits a unique combination of mathematical power and physics insight, and his contributions have significantly enriched both fields. He has greatly contributed to the modern interest in superstrings as a candidate theory for the unification of all known physical interactions. 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*

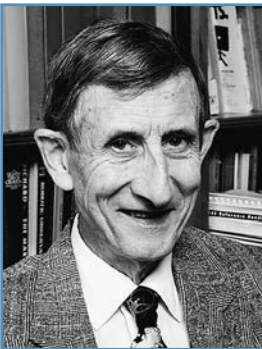
Matias Zaldarriaga has made many influential and creative contributions to our understanding of the early universe, particle astrophysics, and cosmology as a probe of fundamental physics. Much of his work centers on understanding the clues about the earliest moments of our universe encoded in the cosmic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

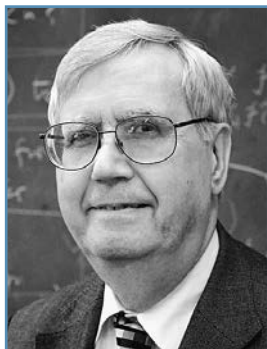
In a series of remarkable, difficult calculations, Stephen Adler demonstrated that abstract ideas about the symmetries of fundamental interactions could be made to yield concrete predictions. The successful verification of these predictions was a vital step toward the modern Standard Model of particle 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.



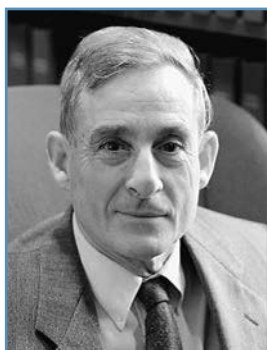
### Freeman J. Dyson

*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.

## MEMBERS AND VISITORS

**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.

**Ben Bar-Or***Astrophysics* · Institute for Advanced Study*Martin A. and Helen Chooljian Founders' Circle Member*

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.

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

Katrin Becker's recent research focuses on describing the spacetime actions arising from string- and M-theory compactifications. The goal of her work is to describe the complete set of spacetime fields and interactions while at the same time keeping supersymmetry manifest. This is achieved by working directly in superspace.

**Melanie Becker***String Theory* · Texas A&M University · *f**IBM Einstein Fellow*

Melanie Becker works in Abelian and non-Abelian tensor models with the goal of constructing an action of eleven-dimensional supergravity, including all the massive states. The Kaluza-Klein approach is used to describe actions in lower dimensions. She is especially interested in models with  $G_2$  structure, some of which lead to semi-realistic models in four dimensions.

**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 cosmic microwave background foregrounds.

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



### 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*

*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 theoretical condensed matter physics, string theory, and geometry.



### Kyle Cranmer

*Particle Physics and Machine Learning* · New York University · *jvp, f*

Kyle Cranmer's research in high-energy physics sits at the boundary of experiment and phenomenology with an emphasis on statistical inference and data analysis methods. At IAS, he plans to further his study of inference with intractable likelihoods defined implicitly through simulations and develop physics-aware machine learning techniques.



### Liang Dai

*Cosmology* · Institute for Advanced Study

*Funding provided by the Raymond and Beverly Sackler Foundation Fund*

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.



### 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.

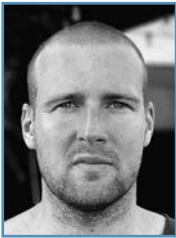


### Yvonne Geyer

*Particle Physics* · Institute for Advanced Study

*AMIAS 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.



### Victor Gorbenko

*Theoretical Physics* · Institute for Advanced Study

*Della Pietra Postdoctoral Member*

Victor Gorbenko works on various problems in theoretical cosmology and quantum field theory. Recently, he has been interested in models of gravity in lower dimensions with the hope of gaining a deeper understanding of its fundamental properties.



### Adrian Hamers

*Astrophysics* · Institute for Advanced Study

*Martin A. and Helen Chooljian Member*

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 multi-star systems, and galactic nuclei. Applications include hot Jupiters, compact objects, type Ia supernovae, tidal disruptions, and gravitational wave sources.



### Keisuke Harigaya

*Particle Physics* · Institute for Advanced Study

*Funding provided by the U.S. Department of Energy*

Keisuke Harigaya is interested in particle physics phenomenology including dark matter, the strong CP problem, inflation models, grand unification, and the electroweak symmetry breaking. He is particularly interested in the parity solution to the strong CP problem and its connection with SO(10) unification.



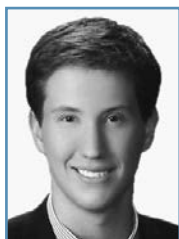
### James Colin Hill

*Cosmology* · Institute for Advanced Study and Columbia University

*Funding provided by the W. M. Keck Foundation Fund*

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 cosmic microwave background surveys, including novel foreground mitigation strategies. He is interested in all aspects of cosmology, from galaxy formation to the very early universe.



**Daniel Steven Kapec**

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

Daniel Steven Kapec is broadly interested in quantum field theory, general relativity, and quantum gravity. His research has focused on various aspects of quantum field theory and quantum gravity in asymptotically flat spacetimes. His recent work has explored a newly discovered correspondence between asymptotic symmetry groups and soft theorems for scattering amplitudes.

**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**

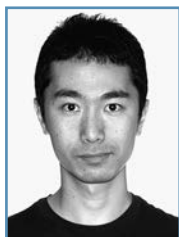
*Astrophysics, Cosmology* · Institute for Advanced Study  
*William D. Loughlin Member*

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.

**Simon Knapen**

*Particle Physics* · Lawrence Berkeley National Laboratory  
*Funding provided by the U.S. Department of Energy*

Simon Knapen's work is in theoretical particle physics with a strong emphasis on the Large Hadron Collider and searches for dark matter. He is particularly interested in studying what the next generation of experiments will look like.

**Shota Komatsu**

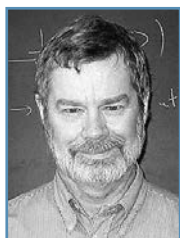
*Quantum Field Theory* · Institute for Advanced Study  
*Funding provided by the U.S. Department of Energy*

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.

## MEMBERS AND VISITORS

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

Petr Kravchuk's research concerns dynamics and kinematics of quantum conformal field theories. He is particularly interested in numerical and analytical approaches to the conformal bootstrap program, which aims to classify and solve such theories starting from basic self-consistency conditions.

**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.

**Nima Lashkari***Quantum Gravity, Quantum Field Theory, Quantum Information Theory*  
Institute for Advanced Study*Funding provided by the National Science Foundation*

Currently, the focus of Nima Lashkari's research is the applications of information theory in quantum field theory and quantum gravity.

**Jing Luan***Theoretical Astrophysics and Planetary Science* · Institute for Advanced Study

Jing Luan applies physics to explain observational puzzles adopting analytical methods. Her current research focuses on dynamics, including orbit dynamics, tidal interaction, stellar and planetary oscillations, and physical librations. These physical processes affect the evolutions of orbits and interiors for planet-satellite and star-planet systems.

**Raghu Mahajan***Quantum Field Theory* · Princeton University · *v*

Raghu Mahajan's research focuses on techniques used 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.



### Victor Mikhaylov

*Biology* · Institute for Advanced Study · *ra*

Victor Mikhaylov works in mathematical physics and biology, focusing on supersymmetric and topological quantum field theories, and the application of modern methods of data analysis to bioinformatical problems.



### Jordi Miralda-Escude

*Astrophysics, Cosmology* · Universitat de Barcelona  
*Comins Glass Works Foundation Fellowship*

Jordi Miralda-Escude's present interests focus on searching for observations of the universe that can tell us about what dark matter is made of. In particular, he is studying observations of gravitational lensing and of absorbing gas in the smallest galaxies in the universe.



### 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.



### Elena Murchikova

*Astrophysics* · Institute for Advanced Study  
*Bezos Member*

Elena Murchikova works on the interface between theoretical astrophysics and observational astronomy. Her research interests span studies of the Milky Way's galactic center black hole with the ALMA telescope, black hole accretion theory, the interiors of neutron stars, and cosmic strings in the vicinity of black holes.



### Tejaswi Venumadhav Nerella

*Cosmology, Astrophysics* · Institute for Advanced Study  
*Friends of the Institute for Advanced Study Member*

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.



### William Isaac Newman

*Theoretical Astrophysics* · University of California, Los Angeles  
*IBM Einstein Fellow*

William Isaac Newman's research interests include dynamical models for solar system(s) and galactic evolution, employing methods from celestial mechanics and advanced computational techniques, as well as stochastic models derived from statistical mechanics and the emergence of pattern, with possible applications to cosmology and hierarchical cluster formation.



### Kantaro Ohmori

*Quantum Field Theory, String Theory* · Institute for Advanced Study  
*Funding provided by the Paul Dirac Fund and the National Science Foundation*

Kantaro Ohmori is interested in a broad range of issues in string theory and 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.



### 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 theoretical predictions for the interpretation and guidance of 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.



### Riccardo Rao

*Systems Biology* · Institute for Advanced Study  
*Martin A. and Helen Chooljian Member in Biology*

Riccardo Rao's research focuses on using the framework of thermodynamic models to investigate specific classes of chemical reaction networks, such as metabolic networks.



### Brant Robertson

*Theoretical and Computational Astrophysics* · University of California, Santa Cruz · *jvp, s*  
*Maureen and John Hendricks Visiting Professor*

Brant Robertson is working on theoretical topics related to galaxy formation, dark matter, hydrodynamics, and numerical simulation methodologies, and on machine learning and computational methodologies applied to large astronomical data sets.



### Vladimir Rosenhaus

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

Vladimir Rosenhaus is interested in quantum field theory and string theory. His recent work has focused on solvable models of the AdS/CFT duality.



### 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.



### Pablo Sartori

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

Pablo Sartori's research focuses on understanding the general principles underlying the dynamics of protein complexes. More generally, he is interested in how high-dimensional systems can be evolved to exhibit low-dimensional dynamics.

## MEMBERS AND VISITORS

**Marcel Manfred Schmittfull**

Institute for Advanced Study

*Corning Glass Works Foundation Fellowship; 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**

*Theoretical Physics* · Institute for Advanced Study

*Roger Dashen 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.

**Frederik Simons**

*Geophysics* · Princeton University · *f*

Frederik Simons studies the seismic, mechanical, thermal, and magnetic properties of planetary lithospheres. He analyzes complex, large, and heterogeneous geophysical data sets, using theoretical and computational inverse methods and statistical techniques. He is developing floating hydrophones to open up the sparsely instrumented oceanic domains for global tomography.

**Tracy Slatyer**

*Particle Physics, Astrophysics, Cosmology* · Massachusetts Institute of Technology · *jvp*

*John N. Bahcall Fellow*

Tracy Slatyer's research uses astrophysical and cosmological data to study open questions in fundamental physics, in particular the nature of dark matter. At the Institute, she plans to carry out a wide-ranging dark-matter-oriented research program, with a focus on exploring the possible signatures of dark matter interactions in the early universe.

**Charlotte Sleight**

*Theoretical Physics* · Institute for Advanced Study

*European Commission Marie Curie Fellowship*

Charlotte Sleight is working on bootstrap approaches to conformal field theories with applications to, and inspiration from, holography.

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

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



### Douglas Stanford

*Theoretical Physics* · Institute for Advanced Study · *m*

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.



### Brian Swingle

*Physics* · University of Maryland · *jvp, f*  
IBM Einstein Fellow

Brian Swingle's current research focuses on the relationships between quantum information, quantum chaos, and quantum gravity. His interests include the dynamics of strongly interacting quantum systems and the experimental simulation of quantum gravity.



### Todd Thompson

*Astrophysics* · The Ohio State University · *jvp*  
IBM Einstein Fellow

Todd Thompson is a theoretical astrophysicist working on a range of topics including the mechanism of core-collapse supernovae, the origin of the heavy elements, the driving mechanisms of galactic winds, and the dynamics of few-body systems of stars and compact objects.



### Yuan-Sen Ting

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

Yuan-Sen Ting is interested in unraveling the evolution of the Milky Way in the past fourteen billion years by extracting statistical information from millions of spectra currently being collected from individual stars in the galaxy. His research operates at the intersection of theoretical modeling, observational astronomy, and machine learning.



## MEMBERS AND VISITORS

**Ken Van Tilburg**

*Particle Physics* · Institute for Advanced Study and New York University

*Funding provided by the U.S. Department of Energy*

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 and the Adler Family Fund*

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 Large Hadron Collider phenomenology.

**Benjamin Wallisch**

*Cosmology* · Institute for Advanced Study

*Marvin L. Goldberger Member*

Benjamin Wallisch's research focuses on cosmological probes of fundamental physics. He is interested in using observations of the cosmic microwave background and the large-scale structure of the universe to extract clues about the laws of nature, both within the Standard Model and beyond.

**Juven Chun-Fan Wang**

*Theoretical Physics* · Institute for Advanced Study

*Funding provided by 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.

**Barak Zackay**

*Astrophysics* · Institute for Advanced Study

*The Peter Svennilson Membership*

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.

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

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

**Ying Zhao**

*Physics* · Institute for Advanced Study

*Funding provided by the Simons Foundation*

Ying Zhao is interested in quantum gravity, quantum information, and black hole physics. She has worked on various aspects of complexity and its application to the understanding of black holes.

## 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 2018–19 academic year is “Crisis and Critique,” led jointly by Didier Fassin, James D. Wolfensohn Professor in the School, and Distinguished Visiting Professor Axel Honneth, Professor of Philosophy at both Goethe-Universität Frankfurt and Columbia University.

Although it could be argued that each epoch in the modern era is regarded by its contemporary as a time of crisis, the present moment seems to offer in this respect certain particular traits in terms of the quality, intensity, and spread of its crisis. Among its various dimensions, two seem distinctively salient: one is moral, the other cognitive. Both trust and truth are at stake, as has been revealed by a series of recent events and controversies that have occurred internationally. Reversing the title of Reinhart Koselleck’s famous inquiry into “the pathogenesis of modern society,” we thus want to address the multiple aspects of the complex relationships between crisis and critique, their roots, their current tensions, their potential openings.

Our explorations will examine the issues raised within diverse national contexts and from diverse intellectual perspectives, convening scholars from different regions and traditions at a global level. Attentive to public debates and social movements which question the present crisis, we will attempt to invent new forms of critical practice. This implies a fruitful dialogue between empirical studies, based notably on ethnographic, archival, and statistical work, and theoretical approaches, whether normative or interpretive, so as to comprehend the current social constellation, analyze its special conditions, and rethink the potentialities of critique.



### Didier Fassin

*James D. Wolfensohn Professor*

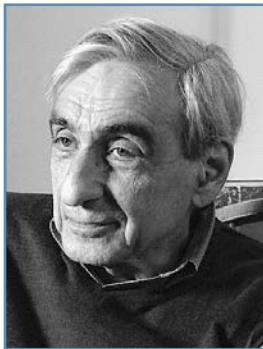
Didier Fassin is an anthropologist and a sociologist who has conducted fieldwork in Senegal, Ecuador, South Africa, and France. Trained as a physician in internal medicine and public health, he dedicated his early research to medical anthropology, focusing on the AIDS epidemic and global health. He later 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 and the prison system. 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 a major collaborative project focused on the history of Jewish political thought.

## MEMBERS AND VISITORS

**Hector Amaya***Philosophy of Communication* · University of Virginia*Infosys Member*

Hector Amaya's project engages new forms of violence and harm afforded by digitization and internet technologies, and evaluates them against normative ideas about publicness and intersubjectivity. These forms of violence include bullying and trolling; hate speech; self-published violence; digital geopolitics, such as political and infrastructure cyber-attacks; and hacking.

**Dorian Bell***Critical Race Studies, Literature* · University of California, Santa Cruz

Dorian Bell's book project examines how contemporary upheavals like migration and populism are reconfiguring racisms in Europe, the United States, and South Africa. It also explores how social media is inducing us to rethink the relationship between structural racism and individual prejudice.

**Mabel Berezin***Historical, Comparative, Political, and Cultural Sociology* · Cornell University

Mabel Berezin researches challenges to democratic cohesion and solidarity in Europe and the United States. At IAS, she will work on a monograph on the resurgence of extreme nationalism in contemporary Europe.

**David Bond***Cultural Anthropology* · Bennington College

How did the environment become visible, factual, and operable? To a striking degree, the specific crisis the environment realized, the forms of responsibility it authorized, and the analytic horizons it routinized all bear the imprint of hydrocarbon afterlives. David Bond's project describes this process and its implications for theory and people today.

**Denise Brennan***Anthropology* · Georgetown University

How do undocumented individuals and their families live with the everyday threat of deportation as well as live through the experience of deportation? Drawing from ethnographic field research in southern and northern border communities, as well as from research in migrant communities deep in the U.S. interior, Denise Brennan's project examines the lived experience of criminalization and surveillance.

## MEMBERS AND VISITORS



### **Robin Celikates**

*Philosophy* · University of Amsterdam

Robin Celikates is working on a book that develops a critical theory of “democratizing disobedience.” His research aims to bridge the gap between the commitment of critical theory to be grounded in social struggles and the undertheorized transformative potential of civil disobedience in response to the structural shortcomings of liberal democracies.



### **Hae Yeon Choo**

*Sociology* · University of Toronto  
*Deutsche Bank Member*

Hae Yeon Choo’s research project examines the politics of land ownership in contemporary South Korea, delving into macro-level political contestations over land rights, together with the narratives of people who pursue class mobility through real estate speculation. The project asks how the paradox of democratic citizenship emerges alongside deepening economic inequality.



### **Daniel Aldana Cohen**

*Political Sociology of Climate Change* · University of Pennsylvania

Daniel Aldana Cohen is a political sociologist who works on the intersection of climate change, inequality, the built environment, and carbon accounting. He studies urban regions of the global North and South, especially New York and São Paulo, and is working on a book project on climate change and inequality in the twenty-first-century city.



### **Rodrigo Cordero**

*Social Theory* · Universidad Diego Portales, Santiago

Rodrigo Cordero’s research is situated in the intersection of critical theory, political sociology, and conceptual history. His current project studies how society becomes an object of critique and intervention in moments of constitutional creation, and explores the material force of concepts in constitutional struggles to define the form of social 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 women’s engagement, careers, and practices in politics.

## MEMBERS AND VISITORS



### Chitralekha Dhamija

*Anthropology* · Jawaharlal Nehru University · *v*

Chitralekha Dhamija describes certain historical particularities to surveillance and resistance in (Indian) Kashmir. Drawing from years of ethnography in some of its most troubled districts, she examines ways in which contemporary discourses (and erasures) in both physical and digital spaces negotiate reflexivities of self, politics, and modes of resistance.



### Gregor Dobler

*Anthropology* · Albert-Ludwigs-Universität Freiburg · *v*

Gregor Dobler is writing on the critical potential of *otium*: moments during which we escape a focus on productivity. In ethnographic descriptions of everyday activities, he shows how people try to escape sheer productivity. Experiences of *otium*, of being at liberty, can become socially and politically effective and lay the grounds for an emic critique of alienation.



### Beshara Doumani

*History* · Brown University

Beshara Doumani's research is focused on a critical social history of Palestinians through the social lives of stone. His project attempts to decolonize and globalize the Palestinian experience by interrogating the meanings of indigeneity, peoplehood, and statelessness as embedded in the material and discursive forces of everyday life.



### Andreas Eckert

*African History* · Humboldt-Universität zu Berlin

*Richard B. Fisher Member*

In his research project, Andreas Eckert argues that the history of different labor forms in Africa—as well as how they were categorized in much of the historiography of the continent—have a great deal to offer by way of lessons to a history of global labor in critically engaging with the idea of the North Atlantic as 'normal' and the rest as 'exceptional.'



### Martin Hartmann

*Philosophy* · Universität Luzern

Martin Hartmann is interested in the impact of various forms of inequality on people's ability to criticize unjustifiable inequalities. He aims to continue and deepen the egalitarianism debate in philosophy, bringing some of its conceptual insights to a more practical level. Hartmann's project situates itself within the tradition of critical theory in seeking to develop an analytical tool for better describing people's inability to critically relate their socioeconomic situation to that of other social strata.





### Rowena Xiaoqing He

*Modern and Contemporary China* · Saint Michael's College

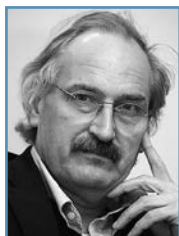
Rowena He's research focuses on the relationship between intellectuals and the state in modern and contemporary China: specifically, the nexus of history, memory, and power, and the implications of these issues for youth values, civic education, and social change. She will work on a book about the roots and development of Chinese student nationalism in post-1989 China.



### Dora Isabel Herrador-Valencia

*Human Geography* · Institute for Advanced Study · *v, s*

Dora Isabel Herrador-Valencia's research interests have mainly focused on human geography, and include rural development and the environment in Latin America through participatory approaches. Recently, she has been interested in mitigation based on adaptation to climate change, an interesting approach that emphasizes adaptation strategies by small-scale farmers in tropical landscapes.



### Axel Honneth

*Social and Political Philosophy, Theory of Society* · Goethe-Universität Frankfurt and Columbia University · *dvp*

Axel Honneth will study the long-run social consequences of the ongoing dissolution of the integrative force of contract-based work. His project will be partly philosophical, investigating the role of socially recognized work for the self-understanding of citizens, and partly socio-theoretical, examining the causes for the exploding crisis of work.



### Murad Idris

*Political Theory* · University of Virginia  
*AMIAS Member*

Murad Idris will be writing a book on constructions of Islam in language across political theory and popular discourse. The project explores the genealogies of claims such as "Islam means submission," "Islam is peace," and "Islam needs a Luther"; appeals to the etymology of the word *islām*; and the political imaginations that make Islam into a subject.



### Eva Illouz

*Sociology, Critical Theory* · Centre de Sociologie Européenne, Paris, and Ecole des Hautes Etudes en Sciences Sociales, Paris  
*Funding provided by the Florence Gould Foundation Fund*

The critique of emotional subjectivity must tiptoe between internal and external critiques, what Eva Illouz calls "post-normative" critique. Based on the view that emotions and economic activities are normally intertwined, this research project evaluates critically the moral norm of emotional authenticity as it has been fashioned by consumer culture.

## MEMBERS AND VISITORS



### Rahel Jaeggi

*Social Philosophy* · Humboldt-Universität zu Berlin

Rahel Jaeggi aims to conceptually develop the idea of a normative-functional crisis, as it is related to the normative-functional “grammar” of life forms and their possible erosion and decline, and to apply the concept by analyzing social conflicts and crises within contemporary societies.



### Michael Kazin

*History of Politics and Social Movements in the Nineteenth and Twentieth Centuries* · Georgetown University

*Friends of the Institute for Advanced Study Member*

Michael Kazin is working on an analytical history of the U.S. Democratic Party, focusing on its organization, constituency, and ideology.



### Munira Khayyat

*Anthropology* · The American University in Cairo

*Wolfensohn Family Member*

Munira Khayyat’s research revolves around life in war. She is working on a book that examines meshworks of collaborative, multi-species survival, or the various ways of propagating and sustaining life that blooms in violent spaces and conditions considered adverse or deadly.



### Ji Li

*Law* · Rutgers Law School

*Zurich Financial Services Member*

Ji Li’s research explores a wide range of topics, including Chinese judicial politics, state-business relations, conflict resolution in transnational contexts, the expansion of emerging market economies, and its institutional impacts in host countries. He is currently working on a book that offers a unified theory for analyzing judicial behavior in China.



### Aldo Marchesi

*Contemporary Latin American History* · Universidad de la República, Uruguay · s

Aldo Marchesi’s history of poverty in contemporary Uruguay will focus on ways in which a series of economic crises changed intellectual and political views on inequality and poverty. To study those views, he will examine political parties, intellectuals, civil society, and international organisms that participated in those debates.



### Clara Elisabetta Mattei

*History of Economic Thought, History of Capitalism, Critical Theory · The New School*

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

Clara Mattie's research contributes to the history of capitalism, exploring the critical relation between economic ideas and technocratic policy making. She is currently working on a book project about economic crisis, technocratic repression, and austerity.



### Anne McNevin

*Politics, International Relations · The New School*

Anne McNevin's research interests include the transformation of citizenship and political belonging, the regulation of borders and migration, and spatiality and temporality in world politics. At IAS, she is exploring critical resources that can enliven a politics of membership and mobility beyond the parameters of open/closed borders and citizen/migrant subjects.



### Jennifer Petersen

*Media Studies · University of Virginia · v*

Jennifer Petersen is working on a history of how media technologies have changed what constitutes the "speech" in free speech law. Her project shows how changes in media technologies, from silent film to computer code, have transformed the way that legal practitioners understand communication, ultimately enabling the inclusion of diverse objects and actions within the legal guarantee of freedom of speech.



### Neryvia Pillay Bell

*Economics · University of Cape Town · v*

Neryvia Pillay Bell's research focuses on the ways in which government policies can reduce inequality by influencing individual outcomes, with a particular focus on education. She is especially interested in how the interaction between resources and identity formation shapes the effectiveness of policy.



### Eugene T. Richardson

*Epidemic Disease, Critical Medical Anthropology · Harvard Medical School · v*

Eugene Richardson is a physician-anthropologist who uses biosocial approaches to explore prevention, containment, and treatment of epidemic disease in sub-Saharan Africa. He is currently writing a book examining the role of discursive power in propagating infectious disease outbreaks.

**Dieter Thomä***Philosophy · Universität St. Gallen*

Dieter Thomä's project on dissent and deviation in times of crisis aims at developing a typology of critical and anti-critical ways of dealing with crises. People may act as troublemakers experimenting with life-forms or building a new order. They may also use anonymity for willfully pursuing their own benefit or for establishing a community immune to criticism.

**Achim Vesper***Philosophy · Goethe-Universität Frankfurt · v*

Achim Vesper's project addresses the question of whether the idea of moral objectivity can be reconstructed within the frameworks of moral constructivism and moral constitutivism. He aims to show that moral constructivism is a project worth defending as long as it is completed by certain aspects of moral realism.

**Greta Wagner***Sociology · Goethe-Universität Frankfurt**Deborah Lunder and Alan Ezekowitz Founders' Circle Member*

Greta Wagner's study examines normative orientations on the part of volunteers engaged in refugee support in rural Germany, where villages until 2015 still often displayed complete ethnic and cultural homogeneity. She is interested in questions about the modes of help, their affective sources, normative pitfalls, and the critical practices connected with them.

**Sophie Wahnich***History of the French Revolution · Centre National de la Recherche Scientifique and École des Hautes Études en Sciences Sociales, Paris*

Sophie Wahnich works on the role of emotions in the construction of social bonds in a past/present relationship. She plans to compare our anxiety today in the face of "hyperbolic doubt" to that arising in the seventeenth and eighteenth centuries with the emergence of a plurality of creeds. She will focus especially on historical anthropology of rituals and of the sacred.

**Jessica Winegar***Anthropology · Northwestern University*

Jessica Winegar's book project about counter-revolutionary aesthetics and Egypt's uprising examines how aesthetic forms, judgments, and practices play a central role in both delegitimizing revolutionary movements and in producing everyday right-wing attachments. It is part of her larger scholarly work on art and cultural politics in the Middle East.

**Deborah J. Yashar**

*Political Science, Comparative Politics, Latin America, Political Economy of Development* · Princeton University · *v*

Deborah J. Yashar's research has addressed the study of regime politics, state capacity, ethnic movements, and violence—themes related to efforts to deepen and/or subvert citizenship. At IAS, she will begin research on urban politics, housing, and ethnic enclaves/segregation in the developing world.

## 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.


**Ayako Fukui**
*Harmonic Analysis* · ARAYA Brain Imaging

Ayako Fukui is working on a project that explores 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.


**Eiko Ikegami**
*Historical Sociology* · The New School

Eiko Ikegami is interested in public spheres in comparative perspective; civility and state formation in Japan; and identities, networks, and social change. She also works on autistic consciousness and virtual worlds.


**Yuko Ishihara**
*Philosophy* · Earth-Life Science Institute, Tokyo Institute of Technology · *f*

Yuko Ishihara specializes in the Kyoto School tradition and classical phenomenology. She is currently working on a liberal interpretation of the phenomenological notion of the “epoché” (suspension of judgment) as a practical method for cultivating an openness towards others and the world.


**Barnaby Marsh**
*Evolutionary Dynamics* · Harvard University

With training in evolutionary biology, economic theory, and psychology, Barnaby Marsh has helped pioneer new approaches to decision strategies and risk-taking. He is currently studying novel approaches to understanding the nature of awareness and representation. At IAS, he is looking at cognitive aspects of generosity, giving, and philanthropy.


**Michael Th. Rassias**
*Mathematical Analysis, Analytic Number Theory* · Universität Zürich

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.



## VISITORS

**Michael Solomon***Bioethics* · Institute for Advanced Study

Michael Solomon's activities for the coming year stem from his bioethics perspective, from the implications of artificial intelligence 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 Turner***Astrophysics* · Princeton University

Edwin Turner is working on statistical biases and estimators for samples of exoplanets, on the Strategic Exploration of Exoplanets and Disks with Subaru 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.

**Corijn van Mazijk***Philosophy* · University of Groningen · *f*

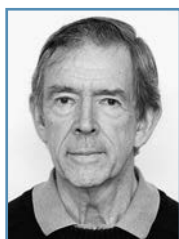
Corijn van Mazijk works on Husserl's phenomenology in relation to fundamental issues in contemporary epistemology and philosophy of mind. He also has a strong interest in Kant and post-Kantian philosophy generally.

**Olaf Witkowski***Artificial Life and Complex Systems* · Earth-Life Science Institute, Tokyo Institute of Technology · *f*

Olaf Witkowski studies information-flows in living systems and collective intelligence. He employs artificial life models—from neural networks to evolutionary robotics—and the language of information theory to elucidate the computation of life, the evolution of intelligence, and future transitions in terms of communication in the bio- and technospheres.

## 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.



**Curtis Callan**

*Theoretical Physicist*

Curtis Callan is a theoretical physicist who has recently become fascinated by the opportunities for theory that modern biology presents. While the phenomena of biology do not submit to mathematically precise theorizing as readily as do those of physics, modern data and statistical thinking suggest well-posed theoretical questions in certain corners of the field. At IAS, Callan aims to develop a deeper theoretical understanding of one such corner, the adaptive immune system, and to identify other areas of biology that are ripe for theoretical thinking.



**Paul A. Hanle**

*Climate Judiciary Project Founder*

Paul Hanle will be forming a project to educate the United States judiciary about the science of climate change. The project's purpose is to make available the scientific grounding needed to make science-based decisions as, increasingly, the judiciary is called upon to decide cases where climate science is central to the proceedings.



**Anna Laqua**

*Institute Visitor*

Anna Laqua is working on forms of communication used for espionage in England under Oliver Cromwell and Charles II. By focusing not only on cryptographic, but also on acoustic practices and tools, she wishes to investigate facets of a history of espionage that has historically received little attention.



**Sally Marlow**

*Broadcaster; Fellow, King's College London*

Sally Marlow is Engagement and Impact Fellow at the Institute of Psychiatry, Psychology, and Neuroscience, King's College London, and a BBC Radio broadcaster. Her work involves bringing mental health messages and science to the attention of the public. During her visit she will be making the documentary *Hotel Genius* about the Institute.

## DIRECTOR'S VISITORS



### George Musser

*Writer*

George Musser is a science writer and editor for magazines such as *Scientific American* and *Quanta* who is embarking on a new book project about the intersection of physics, neuroscience, and artificial intelligence. He hopes to explore each of these realms while at the Institute.



### Sarah Anna Paden

*Institute Visitor*

Sarah Anna Paden will finish work on a large-scale project exploring the intersections between Buddhism in America and experimental music after World War II. Through this examination of the lives and work of a handful of now-prominent composers, an interesting web of relationships (both cultural and aesthetic) emerges between Buddhist practice and artistic practice in the American landscape.



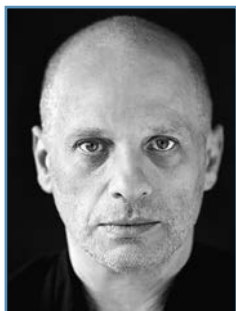
### Iqbal Riza

*Special Adviser to the Secretary-General of the United Nations*

Iqbal Riza intends to compare the paths of the historical currents and decisions that led to the emergence of Israel and Pakistan as independent states, and the subsequent political course of each in their internal governance and foreign relations.

## Artist-in-Residence Program

THE ARTIST-IN-RESIDENCE PROGRAM was established in 1994 to underscore the Institute's dedication to scholarly and artistic endeavors. Unrestrained curiosity, risk-taking, and even blind faith are concepts native to transformative research and the visual and performing arts. As part of the Artist-in-Residence program, a pioneering artist is appointed to join the Institute community and curate the Edward T. Cone Concert Series, pursue their creative and intellectual work, and exchange ideas with scholars from all disciplines. Composer David Lang, who was appointed as Artist-in-Residence in 2015, continues his appointment in 2018–19, bringing esteemed musicians from around the world to perform on the Institute campus.



**David Lang**

*Composer*

David Lang is a Pulitzer Prize-winning composer whose recent works include the score for Paolo Sorrentino's film *Youth*, which received Academy Award and Golden Globe nominations; *man made*, a concerto for Sō Percussion and orchestra; his opera *anatomy theater*, written in collaboration with visual artist Mark Dion; *the public domain*, a commission from Lincoln Center for one thousand amateur singers; and his opera *the loser*, based on the novel by Thomas Bernhard, for which Lang served as librettist, composer, and stage director. Lang is Professor of Music Composition at the Yale School of Music and co-founder and co-artistic director of New York's legendary music festival Bang on a Can. His opera *prisoner of the state* will premiere in New York in June 2019.

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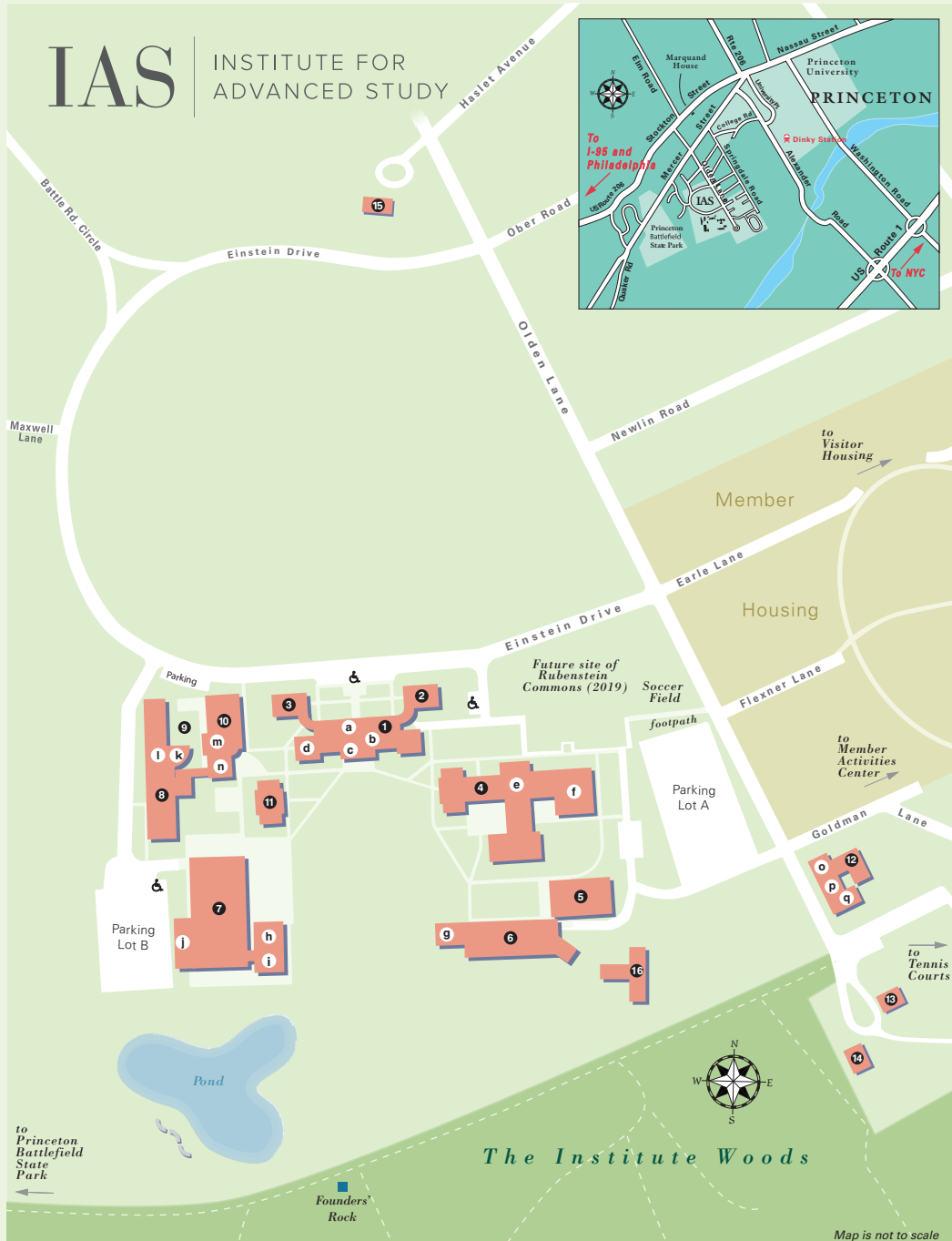
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