IAS INSTITUTE FOR ADVANCED STUDY

Faculty and Members 2019–2020

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Introduction

THE INSTITUTE FOR ADVANCED STUDY is an international center for theoretical research and intellectual inquiry that provides an exceptional environment for the acceleration of ideas and knowledge. It creates time and space for solitary work as well as dialogue among some 250 researchers selected and mentored each year from more than 100 institutions around the world and at various stages in their careers by a permanent Faculty, each of whom are preeminent leaders in their fields. From postdocs with new perspectives and tools, to established experts who create and advance fields of inquiry, the Institute's focused yet freely inquisitive atmosphere enables advancement in unforeseeable ways, leading to societal innovation and new understanding.

Research spans four Schools—Historical Studies, Mathematics, Natural Sciences, Social Science—and is focused on long-term and fundamental outcomes with no concern for immediate application but rather revolutionary and sustained impact. IAS is a scholar's paradise—a campus of unparalleled energy and curiosity, free of external pressures and academic restraints, where exceptional minds have boundless opportunity to explore what is not yet known. Thirty-three Nobel Laureates, forty-two of the sixty Fields Medalists, and eighteen of the twenty Abel Prize Laureates, as well as many winners of the Wolf and MacArthur prizes, have been affiliated with the Institute.

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, serendipitous interaction, and friendship.

Located in Princeton, New Jersey, the Institute was founded in 1930 with the motto "Truth and Beauty." It is an independent educational institution that charges no tuition and relies on charitable contributions and grants for its operation. Brother-and-sister philanthropists Louis Bamberger and Caroline Bamberger Fuld established the Institute in 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. Long and complex chains of knowledge have developed in numerous and astounding ways through research originating at the Institute—from the development of programmable computers and the uncovering of deep symmetries of nature to advances in societal understanding and historical practice. Current research at IAS involves pursuing a theory of everything that governs the smallest and largest phenomena in our universe, a unified framework pursued by IAS founding Professor Albert Einstein, father of the theory of relativity; using computational tools, models, and simulations to determine the origins and long-term fate of the universe; establishing the theoretical foundations of machine learning; reconstructing history through textual and material evidence, utilizing digital resources, climate data, and genetic information; examining facets of society previously overlooked or hidden, such as racial formation and social citizenship and emerging scientific and technological phenomena; and developing a critical anthropology of politics and morality.

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. Flexner's vision has been maintained by his successors as Director: Frank Aydelotte, J. Robert Oppenheimer, Carl Kaysen, Harry Woolf, Marvin L. Goldberger, Phillip A. Griffiths, and Peter Goddard. In July 2012, Robbert Dijkgraaf became the Institute's ninth Director.



Robbert Dijkgraaf

Director and Leon Levy Professor

Robbert Dijkgraaf is a mathematical physicist and a distinguished public policy adviser who has made important contributions to string theory and the advancement of science education. Past President of the Royal Netherlands Academy of Arts and Sciences and Past Co-Chair of the InterAcademy Council, Dijkgraaf is a recipient of the Spinoza Prize, the highest scientific award in the Netherlands, a Knight of the Order of the Netherlands Lion, and a member of the American Academy of Arts and Sciences and the American Philosophical Society. Dijkgraaf is most recently the author of The Usefulness of Useless Knowledge (Princeton University Press, 2017) in which he and IAS founding Director Abraham Flexner articulate how essential basic research and original thinking are to innovation and societal progress, a belief that has informed the mission of the Institute for nearly ninety years.

School of Historical Studies

Administrative Officer: Danette Rivera

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 cooperations 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.

FACULTY



Suzanne Conklin Akbari

Professor · Medieval Studies

Suzanne Conklin Akbari has expanded the range and methods of exploring texts from the Middle Ages, pushing the boundaries of traditional readings and exploring shared histories. Her research has traced the evolving relationship between sight and knowledge as manifested in a range of poetic texts, explored the relationship between Islam and Christianity, challenged the notion of medieval European literature's insularity, and highlighted the influence of Arabic poetry, music, and philosophy. She is currently working on a survey of metaphor and metamorphosis as they were understood in England and France circa 1400, and an examination of how premodern people saw themselves situated in history.



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.

Jonathan Haslam

George F. Kennan Professor · History of International Relations (Late Modern)

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

Myles Jackson, a historian of science, explores the intersections between science, technology, aesthetics, history, and society. The breadth of Jackson's research extends from the artisanal production of scientific knowledge in nineteenth-century Germany to molecular biology and physics, intellectual property and privacy issues, knowledge sharing, race and genomics, bioengineering, and the interactions between musicians, natural scientists, and radio engineers. His scholarship is noted for its crossdisciplinary methodology and interweaves economic, commercial, and scientific insights, pushing the boundaries of the field to establish fresh lines of inquiry.

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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

Andrew W. Mellon Professor of History · Early Modern Europe 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 European, Jewish, and Mediterranean studies, 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. ŝ

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.



Patrick J. Geary

Professor Emeritus · 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.

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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 eighteenthcentury French materialists) on the Enlightenment and on the emergence of modern ideas of democracy, equality, toleration, freedom of the press, and individual freedom.



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 nineteenthand twentieth-century Europe. His most recent books are *Myth and Modemity: 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 published as *Krieg, Geschichte, Theorie* (Miles-Verlag, 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. ŝ

MEMBERS AND VISITORS



Hassan Farhang Ansari

Islamic Law and Theology · Institute for Advanced Study · m Funding provided by the National Endowment for the Humanities Hassan Ansari focuses on the study of Islamic theology, philosophy, law, and legal theory.



Robert James Antony

Chinese History \cdot Guangzhou University $\cdot v, f$

Robert Antony's research aims to fill a hiatus in current studies on the interrelationships between empire-building, legal regimes, and piracy by examining the internal dynamics of China's Qing Empire between the seventeenth and early twentieth centuries.



Archaeology and History of Inner Asia · Universität Bonn Gerda Henkel Stiftung Member

Jan Bemmann studies the interrelationship and interdependency of cities and nomadic empires on the Mongolian Plateau. Karakorumthe first capital of the Mongol world empire-plays an eminent role in his research and will be addressed in a book project.

Ruth Ben-Ghiat

Modern European History · New York University · s Funding provided by the Andrew W. Mellon Foundation

Ruth Ben-Ghiat's research explores the experiences of the 1.4 million Italian military men held captive by the French, Germans, and British during World War II. Drawing on diaries, letters, and archival documents from six countries, the book recounts how this mass captivity changed a generation of men, their families, and the societies that hosted them.



Lauren Benton

History · Vanderbilt University

Lauren Benton's research project examines widely recurring practices of violence and peacemaking in the early modern world and analyzes their effects on regional and global orders, and their relation to interpolity law.

Funding provided by the Andrew W. Mellon Foundation



Thibaut Boulay

Ancient History · Université de Tours

Thibaut Boulay is studying the long history of Greek enclosed vineyards and of their different cultivations. His research will cast light on the plasticity of these multispecific viticultural models, and on the technical constraints of a multispecific viticulture, including training systems, growth and renewal sizes, and architecture and growth direction of the plants.



Aaron Michael Butts

Near Eastern Studies · The Catholic University of America The Andrew W. Mellon Foundation Fellowships for Assistant Professors Aaron Butts's research is focused on the languages, literatures, and history of Christianity in the Near East, including especially Arabic, Ethiopic, and Syriac. His current book project investigates the so-called conversions of Ethiopia to Christianity.



Archaeology of the South Caucasus · Columbia University The Andrew W. Mellon Foundation Fellowships for Assistant Professors

Hannah Chazin is exploring the connections between pastoralism and political authority in the ancient South Caucasus. Her research traces how modern ideas about human nature shaped accounts of pastoralism, reducing the value of herd animals to merely cash or calories and obscuring the dynamism of ancient pastoralist societies.



Tamara Chin

Comparative Literature · Brown University

Frederick Burkhardt Fellowship funded by the American Council of Learned Societies Tamara Chin's research approaches the Silk Road as a modern idea one of several conceptual frameworks and rhetorical tropes of China's interconnected antiquity that emerged during the century spanning new imperialism and the Cold War, from ca. 1870 to ca. 1970.



Godefroid De Callataÿ

Islamic Studies · Université Catholique de Louvain Willis F. Doney Member

Godefroid De Callataÿ is the principal investigator of an Advanced European Research Council project for which he plans to organize at IAS a conference on Bāținism between orthodoxy and heterodoxy in tenth-century al-Andalus. He also plans to prepare a critical edition of *Maslama ibn Qāsim al-Qurțubī's Rutbat al-ḥakīm ("The Scale of the Sage"*).











Charlotte Denoël

Medieval Manuscripts · Bibliothèque Nationale de France George William Cottrell, Jr. Member Charlotte Denoël's research project on book illumination in France during the tenth and eleventh centuries seeks to present the diverse products of this time of intense creativity, in order to create both the first comprehensive study of illuminated manuscripts of this period and

a robust, analytic historiography to frame their place in art history.

Paul Chandler Dilley

Religions of Late Antiquity · The University of Iowa

Frederick Burkhardt Fellowship funded by the American Council of Learned Societies

Paul Chandler Dilley will explore six late antique biographies of monastic saints—including repentant prostitutes, adulterers, and cross-dressing abbots—that adapt comic routines from Greco-Roman theatrical mime. These texts form a carnivalesque subgenre that engages therapeutically with prohibited emotions and thoughts to address tensions in early monasticism.

Mary Kamal Farag

Late Antiquity · Princeton Theological Seminary Funding provided by the Patricia Crone Fund

While at IAS, Mary Farag will be analyzing Coptic and Arabic retrospective narratives of church consecrations to show how the writers "thought with" such significant occasions to craft responses to contemporary political and social issues.

Zbigniew Tomasz Fiema

Archaeology, Ancient History · University of Helsinki Funding provided by the Patrons' Endowment Fund and the Hetty Goldman Membership Fund

Through comprehensive and multidisciplinary research, Zbigniew Fiema intends to generate an up-to-date synthesis of the cultural history of Petra in late antiquity (fourth–eighth centuries C.E.). The research draws upon archaeological, papyrological, and epigraphic data, and upon Fiema's thirty years of archaeological fieldwork in Petra.

Arnaud Fossier

Medieval Italy, Church and Canon Law · Université de Bourgogne Funding provided by the Herodotus Fund

Arnaud Fossier is currently writing a book based on judicial bishop's archives of Pistoia in Tuscany. Fossier pays particular attention to the conflicts between clergy and parishioners, the marriages of lay people, and the economy of credit at the end of the Middle Ages.

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Heidi Catherine Gearhart

Art History, Medieval Europe · Humboldt-Universität zu Berlin Elizabeth and J. Richardson Dilworth Fellow; additional funding provided by the Ruth Stanton Foundation

Heidi Gearhart's research explores how artists and artistic projects were recorded in the high Middle Ages (ca. 1050–1200) in the Low Countries and northern France. By examining images of artists and texts about art-making as deliberately recorded memories, Gearhart analyzes the functions they serve: as tools to define social hierarchies, or as expressions of morals and power.

Eva Giloi

Modern Germany · Rutgers, The State University of New Jersey Martin L. and Sarah F. Leibowitz Member

Eva Giloi is working on a book manuscript that tells the story of six authors of middling success in Wilhelmine Germany, from a wide range of class, educational, gender, and political backgrounds. Alongside her work in German history, she is developing a project on urban thresholds, access and affect in city spaces, the phenomenology of place, and other topics in urban geography.



Marius Hauknes

History of Art · University of Notre Dame Agnes Gund and Daniel Shapiro Member

Marius Hauknes's research focuses on the relationships between art, science, and mythology in twelfth- and thirteenth-century Mediterranean painting.





Daniel Bernardo Hershenzon

Early Modern History · University of Connecticut John Elliott Member

Religious artifacts circulated in the thousands in the early modern western Mediterranean, crossing boundaries between Christianity, Islam, and Judaism. Daniel Hershenzon's project argues that these disparate and plundered religious artifacts became religious boundary markers, defining group membership and determining how these groups interacted with one another.

Aaron Hershkowitz

Ancient History, Epigraphy · Institute for Advanced Study · ra Funding provided by the Charles and Lisa Simonyi Fund for Arts and Sciences; additional funding provided in memory of Fowler Merle-Smith

Aaron Hershkowitz coordinates the Krateros Project to digitize the Institute's collection of epigraphic squeezes. He is also working on a comprehensive assessment of those political leaders in classical Athens who are labeled "demagogues" and their role in fiscal administration and initiation of policy.





Joshua Howard

Modern Chinese History · University of Mississippi The Starr Foundation East Asian Studies Endowment Fund Member Joshua Howard is conducting the first study of the Chinese Communist press and its relationship to social change and labor during the Second Sino-Japanese War (1937–45) and postwar labor movement. Howard is examining the history of the New China Daily, its rapport with its workingclass, women, and youth readership, and patterns of organizational and ideological development that would be applied nationwide after 1949.

Rob Iliffe

History of Science · University of Oxford Ralph E. and Doris M. Hansmann Member

While at IAS, Rob Iliffe will be working on the history of narratives of scientific creativity from 1620 to 1980, particularly in connection with the role of the scientific imagination, and associated advice regarding how it should be nurtured, disciplined, or even suppressed in order to promote scientific progress. His project will examine a number of disputes and totemic creative episodes in the history of science.

Christopher P. Jones

Classical Philology and History \cdot Harvard University \cdot ra Christopher Jones is interested in Greek and Latin authors, especially of the period 1–300 C.E., Greek and Roman history of the same period, and Greek epigraphy.





Matt Kadane

Early Modern Europe · Hobart and William Smith Colleges · s Willis F. Doney Member

Matt Kadane is working on a book on the Enlightenment and the concept of original sin that tries to explain how eighteenth-century people understood Enlightenment culture and why they chose to embrace or reject it.

Juliette Kennedy

Mathematical Logic, Foundations of Mathematics \cdot University of Helsinki $\cdot v$, f

Juliette Kennedy will be working in the Gödel Nachlass, pursuing questions related to Gödel's role in the history of forcing. She is also writing a book on strong logics, i.e., extensions of first-order logic having some of the properties of first-order logic, but with greater expressive power. Finally, she is editing a book devoted to the philosopher Penelope Maddy.

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George A. Kiraz

Ottoman History of Religious Minorities, Syriac Studies \cdot Beth Mardutho: The Syriac Institute \cdot ra

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

Hiroaki Kuromiya

Modern Eurasian History · Indiana University The Starr Foundation East Asian Studies Endowment Fund Member

Vladimir Putin recently declared that "the liberal idea" had "outlived its purpose." Russia's deliberate and shrewd effort to undermine the liberal-democratic world order is nothing new. Hiroaki Kuromiya's project on the Eurasian Continent from the Russo-Japanese War to World War II seeks to explain this global effort of Russia from a historical point of view.

Fabio Lanza

Modern Chinese History \cdot The University of Arizona $\cdot f$ Roger E. Covey Member in East Asian Studies

Fabio Lanza's research project looks at the ordinary, the everyday, and the urban as privileged sites of intervention in Maoist China. Centered on the history of the urban commune movement in Beijing (1958–62), it examines the ambitious attempt to transform the daily practices of families and women and massively increase production at the same time.





Hartmut Leppin

Ancient History \cdot Goethe-Universität Frankfurt $\cdot f$

The subject of Hartmut Leppin's research is church history and historiography of late antiquity. He is focusing on the role of bishops in Greek and Syriac sources and on the use of the word *parrhesia* ("frankness"). This word is unique, as it has a long history going back to the Athenian democracy before later developing into an important monastic and episcopal virtue.

Deirdre Loughridge

Music · Northeastern University Edward T. Cone Member in Music Studies

Deirdre Loughridge's current research examines human/machine configurations in music, beginning with the eighteenth century and extending to posthumanist theory and machine learning. The project aims to illuminate the ongoing process of constructing human/non-human boundaries, the consequences of those boundaries, and the importance of music to experiencing and transforming them.











Isabelle Marchesin

Medieval Iconography, Visual Semiotics · Institut National d'Histoire de l'Art, Paris · v

Isabelle Marchesin's research focuses on musical iconography, visual semiotics (especially geometry and ratios in medieval images), and ontology in Christian images. She is currently working on late antique and early Christian ivories and manuscript illumination.

Molly Nesbit

Art History · Vassar College · s Funding provided by the Andrew W. Mellon Foundation

With the modernization and industrialization of culture, the question of the work of art's function was raised high, though it was soon to be occluded by other, market-driven arguments about its actual value. Still, the effort to open up the work of art to ever-better, basic, existential functions has continued. They are the focus of Molly Nesbit's research.

Esen Ogus

Classical Archaeology · Austin Peay State University Funding provided by the Hetty Goldman Membership Fund

Esen Ogus's research interests include Roman and late antique art and visual culture, social history, and archaeological method and theory. While at IAS, she will work on her second book, which is on the agency of portrait statues, and the "entanglements" of humans and statues in late antiquity (fourth–seventh centuries C.E.).

Charles Parker

Early Modern Europe, World History · Saint Louis University Felix Gilbert Member

Charles Parker is examining the Calvinist missionary project, the earliest and most sustained Protestant global missionary enterprise to venture outside of Europe, within the commercial operations of East India and West India companies. He will explore two basic questions: how did Calvinism contribute to commercial empire and how did commercial empire affect Calvinism?

Anthony Michael Petro

History of Religion and Visual Studies · Boston University Funding provided by the Fund for Historical Studies

Anthony Petro is interested in the role of religious iconography in contemporary American art. Why has religious imagery proved so powerful for artists working with themes of gender and sexuality, artists who are often attacked as "anti-religious"? And how have culture wars debates over this work shaped contemporary habits of seeing the sacred and the profane?

MEMBERS AND VISITORS











Marjorie Elizabeth Plummer

Early Modern Religion, Gender History \cdot The University of Arizona $\cdot f$ William D. Loughlin Member

At IAS, Beth Plummer will explore the continued presence of nuns, regardless of religious identity or devotional practice, and mixed confessional convents in Protestant cities and territories of the Germanspeaking parts of the Holy Roman Empire as a complex lived experience of religious reform, hybrid devotional practice, and confessional accommodation during the sixteenth century.

Anne-Valérie Pont

Roman History, Epigraphy, Empire, Cities · Université Paris-Sorbonne Funding provided by the Herodotus Fund

Anne-Valérie Pont's research will focus on the administration of public wealth by the élites in Roman cities, investigating both ethical and legal norms, as well as the routines of local government. Pont thus aims to provide insights on the economic expectations concerning participation in public life, and on the realistic standpoint of the Roman administration.

Regine Pruzsinszky

Ancient Near Eastern Studies · Albert-Ludwigs-Universität Freiburg · s Funding provided by the Fund for Historical Studies

At IAS, Regine Pruzsinszky will be examining the sociocultural position(s) of singers in the ancient Near East, and conducting an indepth investigation of their organization and tasks and their relationship to political and religious power based on cuneiform documents from the third to the first millennium B.C.E. One key issue is the singers' controversial role in the transmission of literary texts.

Lisa Regazzoni

Early Modern France, Material Culture \cdot Goethe-Universität Frankfurt $\cdot f$ Funding provided by the Fund for Historical Studies

The aim of Lisa Regazzoni's research project is to rethink from a new perspective the epistemology of the field of knowledge that deals with the "Gallic past" in France during the eighteenth and early nineteenth centuries. This field of research is not primarily accessed by means of written historical narratives, but rather through the monument as material and immaterial remains.

Christian (Xian) Robin

Ancient History · Centre National de la Recherche Scientifique, Paris Funding provided by the Patricia Crone Fund

While at IAS, Christian Robin aims to write an updated survey of late antiquity in Arabia, nearly fifty years after the resumption of archaeological investigations. What makes the contribution new is the study of the many recently discovered epigraphical texts, compared with all the sources, including the Arabo–Muslim scholarly tradition.











Andrew Sartori

Intellectual History · New York University · f Willis F. Doney Member

Andrew Sartori is exploring how seventeenth-century discourses of trade, credit, and money transform into the foundations for an anatomy of "the social" as a new object of systematic knowledge, and how the political economy of "commercial society" developed specifically out of analyses of commercial practices that traversed boundaries of sovereignty and jurisdiction.

Gideon Shelach-Lavi

Archaeology · The Hebrew University of Jerusalem · s

While at IAS, Gideon Shelach-Lavi will be studying medieval longwalls of the Mongolian steppe. These walls, which were built between the eleventh and thirteenth centuries, cover a distance of over 3,500 kilometers, but it is unclear who built them and for what purpose. Shelach-Lavi's work will combine archaeological, historical, and paleoclimatic data.

Andrew Sloin

Soviet, European, and Jewish History · Baruch College, The City University of New York Hans Kohn Member

At IAS, Andrew Sloin will be working on a manuscript on socialism and the Yiddish historical imagination, 1871–1948. This work examines the relationship between the writing of popular radical history in the transnational Yiddish public sphere and the development of Jewish internationalist socialist politics.

Gabriela Soto Laveaga

History of Science in Latin America and India · Harvard University AMIAS Member

Gabriela Soto Laveaga's research weaves together two microhistories one in Mexico and one in India—to examine the impact of twentiethcentury hybrid seed technology in a pair of farming communities. Her research examines how local distribution of, and disputes over, land and water, as well as ethnic tensions among farmers, influenced where science was conducted and how this choice ultimately led to what type of hybrid seed was developed for global consumption.

Justin Stearns

History of the Middle East · New York University Abu Dhabi Patricia Crone Member Justin Stearns is interested in history of science in the premodern Muslim world.



Daniel Strum

Early Modern Atlantic History \cdot University of São Paulo \cdot s Funding provided by the Fund for Historical Studies

Daniel Strum is analyzing the mechanisms that promoted honesty and diligence in overseas commercial relations in the early modern sugar trade linking Iberia, Brazil, and the Netherlands. He is currently examining the coevolution of plural legal systems, transnational professional reputation mechanisms, and social constraints within diasporas (Sephardim in particular) against the backdrop of the Atlantic imperial rivalries and religious confessionalization.

Hiroshi Takayama

Medieval History \cdot The University of Tokyo $\cdot f$ Willis F. Doney Member

While comparing medieval polities in Europe, Hiroshi Takayama has been studying cross-cultural contacts in the Mediterranean area, focusing on medieval Sicily, a crossroads of Latin, Greek, and Islamic cultures.



Marion Thomas

History of Life Sciences and Primatology · Université de Strasbourg Founders' Circle Member; funding provided by Deborah Lunder and Alan Ezekowitz Marion Thomas works on the history of primatology and biomedicine. Her project focuses on the place of primates in the medical and psychological sciences. A detailed study of the circulation of apes and knowledge between Paris, Kindia (Guinea), and the United States will help to reassess the functioning of the Pasteur Institute at the heart of modern bioscience.



Kira Thurman

German History, Musicology, and Black Studies • University of Michigan The Andrew W. Mellon Foundation Fellowships for Assistant Professors

At IAS, Kira Thurman will be completing her book manuscript, which examines the history of black musicians in Germany and Austria since the mid-nineteenth century.



Stephen V. Tracy

Greek History and Epigraphy \cdot American School of Classical Studies in Athens \cdot ra

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











Karina Urbach

Modern International Relations and Jewish Family History \cdot University of London $\cdot v$

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.

Glen Van Brummelen

History of Astronomy · Quest University Canada Funding provided by the Fund for Historical Studies

Glen Van Brummelen is interested in medieval mathematical astronomy in Islamic cultures and in Latin Europe. He is studying the spherical astronomy of Giovanni Bianchini (fifteenth century) to understand his role in the emergence of early modern astronomy and the decimal number system. He is also hoping to identify traces of Arabic scholarship in his astronomical work.

Daniel Martin Varisco

History · American Institute for Yemeni Studies Funding provided by the Patricia Crone Fund

Daniel Varisco is completing a monograph on agriculture in Ayyubid and Rasulid Yemen (thirteenth–fifteenth centuries C.E.). The Rasulid era in Yemen coincides with the early Mamluk period in Egypt, although it has received far less attention from historians. This project will provide comprehensive documentation of the information available in a wide range of Rasulid-era sources on Yemen's agricultural systems.

Alla Vronskaya

History of Modern Architecture · Illinois Institute of Technology Funding provided by the Herodotus Fund

Alla Vronskaya is working on an intellectual history of Soviet architecture, 1917–41, that situates Soviet interwar architectural theory in its transdisciplinary and transnational context, unpacking it as a discourse about society and the human. It identifies this discourse as monism, an intellectual framework centering on "life," a synthetic notion developed at the intersection of architecture, psychology, and social engineering.

Ao Wang

Literature, Poetry · Wesleyan University Funding provided by the Gladys Krieble Delmas Foundation

Ao Wang's research focuses primarily on Chinese poetry and its intersections with other literary genres and intellectual fields. He writes literary criticism in both his native Chinese and English. He has received awards for his own poetry, and he translates poetry from and into Chinese, including works of Wallace Stevens, W. H. Auden, and Seamus Heaney.







Laura Weigert

Art History · Rutgers, The State University of New Jersey Funding provided by the Patrons' Endowment Fund

Laura Weigert's project focuses on the long fifteenth century, a pivotal moment in the formation of media distinctions in the visual arts and in the privileging of painting as practice and autonomous object. She aims to chart the complexity and contested nature of the terrain from which these categories emerged and to recover alternate trajectories to the account upon which they are anchored.

Cord Whitaker

Medieval Literature and the History of Race · Wellesley College Friends of the Institute for Advanced Study Member

Cord Whitaker is currently researching nineteenth- and twentiethcentury African American medievalism—in literature, history, and other disciplines. His work aims to show that the modern racial colorline is also a time-line that defines yet transcends the divide between the Middle Ages and modernity—and one that Harlem Renaissance authors used to advance their clarion call for blacks' equal claim to America's cultural heritage.

Judith Cinema Zeitlin

Chinese Literature and the Arts · The University of Chicago · s The Starr Foundation East Asian Studies Endowment Fund Member

Judith Zeitlin is writing a book on musical entertainment in the social, material, and literary culture of sixteenth- and seventeenth-century China, which centered on the twin fashions for opera and courtesans. The book is structured around three key components: the singing voice, the musical text, and the musical instrument.

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 theoretical 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 nine decades 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 2019–20 academic year, the School will have a special program on Optimization, Statistics, and Theoretical Machine Learning. Sanjeev Arora 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 week-long workshop held on campus.



Camillo De Lellis

IBM von Neumann Professor

Camillo De Lellis, geometric analyst, has broad expertise in the calculus of variations, geometric measure theory, and fluid dynamics. Using modern tools and innovative approaches, de Lellis has contributed to central problems in analysis and geometry, resulting in the creation of a transparent proof of regularity and opening new lines of inquiry for geometric analysts to explore.



Helmut Hofer

Hermann Weyl 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."



Jacob Lurie

Professor

Jacob Lurie's research has influenced a diverse range of fields from topology to number theory, providing foundational work that has changed the way mathematicians describe and work with derived phenomena. His ideas have redefined the foundations of homotopy theory and topological aspects of algebraic geometry, providing a channel through which algebraic topology influences algebraic geometry. His proof of the Baez-Dolan cobordism hypothesis changed the field drastically, providing a precise dictionary between manifold theory and operadic algebra as well as an applicable language for topological field theory. ഗ

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.



Akshay Venkatesh

Robert and Luisa Fernholz 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)?

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FACULTY



Enrico Bombieri

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.

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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.

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Federico Ardila

Algebraic and Geometric Combinatorics \cdot San Francisco State University $\cdot v$, s Federico Ardila is interested in the investigation of objects in algebra, geometry, topology, phylogenetics, and optimization by understanding their underlying combinatorial structure.

Raman Arora

Stochastic Optimization, Deep Learning, Representation Learning · Johns Hopkins University

Funding provided by Eric and Wendy Schmidt

Raman Arora's research centers around representation learning, a fundamental challenge in machine learning where the goal is to learn a representation (often using unlabeled data, which is cheap and abundant) that reveals intrinsic low-dimensional structure in data, disentangles underlying factors of variation, and is useful across multiple tasks and domains.

Sanjeev Arora

Theoretical Computer Science, Machine Learning · Princeton University · dvp 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. He is directing the year's special program in Optimization, Statistics, and Machine Learning.



Statistical Signal Processing · University of Michigan Funding provided by the Charles Simonyi Endowment

Laura Balzano's research projects are in statistical signal processing, matrix factorization, and optimization, particularly dealing with large and messy data. She has worked in the areas of online algorithms, non-convex formulations for matrix factorization, compressed sensing and matrix completion, network inference, and sensor networks.



Bhargav Bhatt

Arithmetic Algebraic Geometry \cdot University of Michigan $\cdot v$, s Bhargav Bhatt is interested in arithmetic geometry, especially in the *p*-adic context.



Vijay Bhattiprolu

Approximation, Optimization · Institute for Advanced Study · v Vijay Bhattiprolu works on extending the theory of approximation algorithms to continuous optimization. A current interest is characterizing operator norms and injective tensor norms that are computationally approximable.











Joan Bruna

Mathematics of Deep Learning · New York University · s

Joan Bruna's research interests focus on developing a mathematical theory of deep learning, spanning its connections with signal processing and harmonic analysis, its links with high-dimensional statistics, and the dynamical aspects related to optimization. Bruna is also interested in applications to physical sciences, such as cosmology and high-energy physics, as well as computational hardness questions in graph inverse problems.

Clark W. Butler

Dynamical Systems · Institute for Advanced Study and Princeton University · vri

Funding provided by the Oswald Veblen Fund

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.

Guang Cheng

Statistics \cdot Purdue University $\cdot f$ Funding provided by Eric and Wendy Schmidt

Guang Cheng is directing a big data theory research group, whose major goal is to develop computationally efficient inferential tools for big data with statistical guarantees. Currently, he is interested in the statistical foundation of deep learning and reinforcement learning.

Yu Cheng

Computer Science \cdot University of Illinois at Chicago $\cdot v$, f Funding provided by Eric and Wendy Schmidt

Yu Cheng is broadly interested in theoretical computer science. His research interests lie in the areas of machine learning, game theory, and optimization. His recent work focuses on addressing the challenges that arise in the interactions between machine learning systems and strategic agents, and designing scalable and provably robust learning algorithms.



Dustin Tate Clausen

Homotopy Theory, Number Theory \cdot Institute for Advanced Study $\cdot v$, s Dustin Clausen is interested in number theory, especially in places where topological or homotopy-theoretic methods are helpful, such as algebraic K-theory.



Maria Colombo

Analysis of Partial Differential Equations · École Polytechnique Fédérale de Lausanne · vnf, f

Funding provided by the National Science Foundation

Maria Colombo is interested in the analysis of partial differential equations, calculus of variations, and geometric measure theory. In particular, she studies the regularity of solutions in fluid dynamics and free boundary problems.

Yaim Cooper

Algebraic Geometry, Machine Learning \cdot Institute for Advanced Study $\cdot v$ 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.



Daniel Anthony Cristofaro-Gardiner

Symplectic Geometry · University of California, Santa Cruz · vnf Minerva Research Foundation Member

Daniel Cristofaro-Gardiner is currently interested in Hamiltonian dynamics and symplectic embedding problems. While at IAS, he plans to study three-dimensional Reeb dynamics, higher-dimensional symplectic embedding problems, the arithmetic of four-dimensional symplectic embedding problems, and the foundations of embedded contact homology.



Sanjoy Dasgupta

Machine Learning Theory \cdot University of California, San Diego $\cdot f$ Funding provided by Eric and Wendy Schmidt Sanjoy Dasgupta works on design and analysis of algorithms for unsupervised learning and minimally supervised learning. SCHOO

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Constantinos Daskalakis

Theory of Computation, Machine Learning, Statistics and Probability Theory, Computational Biology · Massachusetts Institute of Technology · s Funding provided by Eric and Wendy Schmidt

Constantinos Daskalakis's research interests include theoretical computer science and its interface with game theory, economics, probability theory, learning, and statistics.

Irit Dinur

Theoretical Computer Science · Weizmann Institute of Science · vp Funding provided by the Friends of the Institute for Advanced Study Endowment

Irit Dinur is interested in theoretical computer science, and especially in error-correcting codes and probabilistically checkable proofs, both of which capture a certain "robustness" in computation. Currently, she is interested in connecting these to so-called high-dimensional expansion -an analogue of expander graphs that draws on group theory, topology, and combinatorics.



Vladimir Drinfeld

Algebraic Geometry · The University of Chicago · vp

Vladimir Drinfeld is trying to understand and simplify the Bhatt-Scholze theory of prismatic cohomology of *p*-adic schemes. The plan is to reformulate it in terms of a certain "prismatization" functor from the category of *p*-adic formal schemes to that of formal stacks.





Simon Shaolei Du

Machine Learning · Institute for Advanced Study

Infosys Member; additional funding provided by the National Science Foundation Simon S. Du's research interests are broadly in machine learning and statistics, such as deep learning, reinforcement learning, transfer learning, (non-)convex optimization, non-parametric estimation, robust statistics, and matrix analysis.

Bianca Dumitrascu

Statistical Genetics, Machine Learning · Institute for Advanced Study · s Funding provided by the National Science Foundation

Bianca Dumitrascu's research brings together Bayesian statistics, optimization, and machine learning, with the goal of developing interpretable methods for structured, high-dimensional medical and genomic data. Dumitrascu develops statistical methods, employing techniques from optimal transport, transfer learning, and deep generative models, with the broader goal of quantifying the impact of genetic variation on biological traits.

MEMBERS AND VISITORS



Alex Eskin

Dynamical Systems, Ergodic Theory \cdot The University of Chicago $\cdot f$ Most of Alex Eskin's recent work is in the field of dynamical systems and is currently focused on finding analogues of some key results of homogeneous dynamics in non-homogeneous settings. In particular, Eskin is looking at dynamics on Teichmüller space, on K3 surfaces, and on character varieties.



Hélène Esnault

Algebraic and Arithmetic Geometry · Freie Universität Berlin · vp Currently, Hélène Esnault is working on special loci in the Betti moduli of complex varieties in relation to the Langlands correspondence, and Scholze's vanishing theorems.





Representation Theory · Institute for Advanced Study 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).



William Feldman

Partial Differential Equations · Institute for Advanced Study Friends of the Institute for Advanced Study Member

William Feldman studies nonlinear partial differential equations and probability. Feldman is especially interested in interface motions and free boundary problems in heterogeneous media.



Mikolaj Fraczyk

Mathematics · Institute for Advanced Study Funding provided by the National Science Foundation Mikolaj Fraczyk works on asymptotic to

Mikolaj Fraczyk works on asymptotic topological invariants of large-volume locally symmetric spaces. Fraczyk is also interested in equidistribution phenomena in number theory, random walks on Lie groups, and ergodic theory.



David Gabai

Low-Dimensional Topology, Hyperbolic Geometry · Princeton University · *s* David Gabai's current interests include questions related to volumes of hyperbolic 3-manifolds, better understanding the topology of ending lamination spaces, and using minimal surfaces to understand Heegaard splittings of 3-manifolds.





Rong Ge

Computer Science \cdot Duke University $\cdot f$ Funding provided by Eric and Wendy Schmidt

Rong Ge is broadly interested in theoretical machine learning. His research has focused on designing new algorithms with provable guarantees for problems like topic modeling, matrix completion, and deep neural networks. At IAS, he is interested in working on problems related to optimization and generalization of neural networks.

Silvia Ghinassi

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

Silvia Ghinassi works in geometric measure theory and its interplay with harmonic analysis and partial differential equations. She is interested in investigating connections between flatness and smoothness for sets of any dimension and codimension, as well as the theory of minimal surfaces.



Amit Ghosh

Number Theory · Oklahoma State University · s

Amit Ghosh's recent research has been on the distribution of the zeros and nodal domains of modular forms, and also on the distribution of lattice points on cubic surfaces. At IAS, he will be working on problems related to these.



Anna Gilbert

Mathematics \cdot University of Michigan $\cdot f$ Funding provided by the Charles Simonyi Endowment

Anna Gilbert's research interests include analysis, probability, discrete mathematics, and algorithms. She is especially interested in randomized algorithms with applications to harmonic analysis, signal and image processing, and massive datasets.



Mark Goresky

Geometry, Automorphic Forms \cdot Institute for Advanced Study $\cdot v$ Mark Goresky is studying the moduli space of abelian varieties with real structures and its finite field analogues.

Roger Grosse

Deep Learning · University of Toronto · s Funding provided by the Charles Simonyi Endowment

Roger Grosse is interested in finding neural network architectures and algorithms that train faster, generalize better, give calibrated uncertainty, and uncover the structure underlying a problem. He also aims to automate the configuration of machine learning systems, from the tuning of hyperparameters to the design of models, architectures, and algorithms.



Shaoming Guo

Harmonic Analysis · University of Wisconsin, Madison · s

Shaoming Guo's research interest is in harmonic analysis and its connections to analytic number theory, combinatorics, geometric measure theory, and partial differential equations. Guo plans to work on projects from decoupling theory that are related to exponential sum estimates from analytic number theory.



Henrik Per Anders Gustafsson

Number Theory, Representation Theory \cdot Institute for Advanced Study Henrik Gustafsson's research interests include automorphic forms and representations, as well as Whittaker functions and their connections to solvable lattice models, with applications to theoretical physics and combinatorics.



Nancy Hingston

Differential Topology and Geometry · The College of New Jersey The core of Nancy Hingston's research is the study of the loop spaces of Riemannian and Finsler manifolds and its applications. In recent years, this study has ranged from differential geometry and closed geodesics to symplectic geometry and string topology. ŝ







Wei Ho

Number Theory, Algebraic Geometry \cdot University of Michigan $\cdot v$, s Wei Ho's research lies at the intersection of number theory, algebraic geometry, and representation theory. Some of Ho's work has revolved around using geometric constructions to study arithmetic questions, such as applications in arithmetic statistics.

Jiaoyang Huang

Probability, Mathematical Physics, Optimization · Institute for Advanced Study

Jiaoyang Huang is interested in probability theory and its applications to problems from statistical physics, computer science, and combinatorics. He is working to understand the spectral statistics of sparse random graphs, particularly the Erdős–Rényi random graphs and the random d-regular graphs. In addition, Huang studies interacting particle systems arising from mathematical physics using tools from stochastic analysis and representation theory.

June Huh

Algebraic Geometry, Combinatorics \cdot Institute for Advanced Study \cdot vpFunding 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, correlation phenomenon for models in statistical physics, and connections between realizability problems in algebraic geometry and combinatorial geometry.



Fotis Iliopoulos

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

Fotis Iliopoulos's interests lie in algorithms and probability. In particular, Iliopoulos has been working on stochastic local search algorithms for finding and sampling solutions of constraint satisfaction problems.



Felix Janda

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

Felix Janda is working on the computation of Gromov-Witten invariants, as well as the geometry of the relevant moduli spaces. At IAS, he intends to further develop a new technique that in particular relates Gromov-Witten invariants of a complete intersection to those of its ambient space.



Yash Jhaveri

Elliptic Partial Differential Equations · Institute for Advanced Study Funding provided by the National Science Foundation

Yash Jhaveri is interested in studying connections between fully nonlinear 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.

Chi Jin



Machine Learning, Optimization, Statistics · Institute for Advanced Study $\cdot f$ Shiing-Shen Chern Member

Chi Jin's recent research primarily focuses on providing deep theoretical understandings of simple or basic algorithms in challenging settings that arise in modern machine learning, including nonconvex optimization, reinforcement learning, and two-player games (or minimax optimization).

Efstratia Kalfagianni

Low-Dimensional Topology and Geometry, Knot Theory, Quantum Topology . Michigan State University $\cdot f$

Efstratia Kalfagianni's research interests are in three-dimensional topology and geometry, knot theory, hyperbolic geometry, and quantum topology. In recent years, she has been studying the interplay and relations between quantum and combinatorial 3-manifold invariants, and geometric structures on 3-manifolds coming from the Thurston geometrization picture.



Adam Klivans

Machine Learning, Computational Complexity · The University of Texas at Austin $\cdot s$

Funding provided by Eric and Wendy Schmidt

Adam Klivans works at the intersection of theoretical computer science and machine learning. His research interests include developing provably efficient algorithms for learning neural networks and graphical models. He also works on making supervised learning algorithms robust to noise.



Samory Kpotufe

Machine Learning · Princeton University · s Funding provided by Eric and Wendy Schmidt

Samory Kpotufe works in machine learning, with an emphasis on nonparametric methods and high-dimensional statistics. Kpotufe's work aims to yield insights on the inherent difficulty of high-dimensional problems under practical constraints arising in real-world application domains. Such understanding leads to improved procedures that can adapt to structural aspects of data.


Andrey Borisovich Kupavskii

Extremal Combinatorics, Discrete Geometry \cdot Institute for Advanced Study $\cdot f$

Andrey Kupavskii is interested in the fields of combinatorics and discrete geometry, as well as their connections with theoretical computer science. Much of Kupavskii's recent research is devoted to questions in extremal set theory, which typically ask for the largest collection of subsets of a finite set that satisfies a certain restriction. Kupavskii is interested in understanding the complexity of different geometric structures using combinatorial tools.

Hyunju Kwon

Partial Differential Equations · Institute for Advanced Study Funding provided by the National Science Foundation Hyunju Kwon is interested in nonlinear partial differential equations. Kwon has been exploring incompressible fluid models, such as the Euler equations, Navier-Stokes, and equations arising from them, using functional and harmonic analysis tools.



Thomas Alexandre Leblé

Mathematical Physics · Institute for Advanced Study Funding provided by the Florence Gould Foundation Fund

Thomas Alexandre Leblé is interested in the statistical physics approach for the study of large random objects. More precisely, Leblé's work focuses on the microscopic behavior of log-gases and related systems.



Jason Lee

Machine Learning · Princeton University · f Funding provided by the Charles Simonyi Endowment

Jason Lee is interested in the understanding of empirically successful machine learning algorithms. His current interests are in stochastic gradient methods for deep learning and deep reinforcement learning.



Ke Li

Machine Learning, Computer Vision, Natural Language Processing and Algorithms · Institute for Advanced Study · s

Ke Li is broadly interested in machine learning methodology and applications. He is working on a replacement for generative adversarial nets that overcomes mode collapse, a method for automatically discovering new optimization algorithms, and a family of randomized algorithms for exact nearest neighbor search that sidesteps the curse of dimensionality.

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Yang Li

Differential Geometry, Geometric Analysis · Institute for Advanced Study Zurich Insurance Company Member

Yang Li's research area lies in differential geometry and geometric analysis, with an emphasis on Calabi-Yau metrics, G2 metrics, and their degeneration behaviors. In addition, he is broadly interested in complex and algebraic geometry, gauge theory, special holonomy, and their connections to physics.

Christopher Joseph Maddison

Machine Learning · Institute for Advanced Study Funding provided by the James D. Wolfensohn Fund

Christopher Maddison works on the development of methods for machine learning, emphasizing methods that work at scale in deep learning applications. Most of Maddison's work is on the topics of gradient estimation and Bayesian inference. The commonality between the problems of numerical integration and optimization has dominated Maddison's work and is a theme Maddison plans to explore at IAS.



Viswambhara Makam

Invariant Theory, Computational Complexity · Institute for Advanced Study Funding provided by the National Science Foundation

Viswambhara Makam is interested in applying algebraic techniques from invariant theory and representation theory to problems in computational complexity and tensors.



Ángel D. Martínez

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

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



Akhil Mathew

Arithmetic Geometry, Algebraic Topology \cdot Institute for Advanced Study \cdot ν, f

Akhil Mathew is interested in topics related to arithmetic geometry and algebraic topology. Some of Mathew's current research focuses on K-theory and topological cyclic homology, which recently have been at the intersection of both fields.



Dor Yosef Minzer

Complexity Theory · 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.



Amir Mohammadi

Lie Groups and Ergodic Theory \cdot University of California, San Diego $\cdot f$ Amir Mohammadi studies the interplay between dynamics and other areas of mathematics, such as number theory and geometry.



Shay Moran

Machine Learning · Institute for Advanced Study · v Funding provided by the National Science Foundation Shay Moran's interests lie in the spectrum between mathematics and computer science, including combinatorics, geometry, information theory, machine learning, statistics, and complexity theory.



Guy Moshkovitz

Combinatorics and Theoretical Computer Science \cdot Institute for Advanced Study $\cdot \ v$

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



Emmy Murphy

Geometric Topology · Northwestern University · vnf Funding provided by The Ambrose Monell Foundation and the National Science Foundation

Emmy Murphy's research is principally in symplectic and contact topology.



Boaz Nadler

Mathematical Statistics, Statistical Machine Learning \cdot Weizmann Institute of Science $\cdot f$

Funding provided by the Charles Simonyi Endowment

Boaz Nadler's research is in mathematical statistics, statistical machine learning, and their applications in various fields. Current research interests include unsupervised learning, latent variable models, high-dimensional statistics, and spectral methods.



Rohit Nagpal

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

Rohit Nagpal's work at IAS will be focused on homological algebra and algebraic topology in the equivariant setting. This has applications to homological properties of arithmetic groups and their Steinberg modules.



Walter D. Neumann

Geometry, Topology · Barnard College, Columbia University · v, fWalter Neumann's current work is focused mostly on germs of reduced complex surfaces (not necessarily isolated).



Jonathan Niles-Weed

Probability and Statistics, Machine Learning · Institute for Advanced Study Jonathan Niles-Weed is interested in statistics and probability questions arising in machine learning, especially for data with geometric structure. His recent work focuses on statistical aspects of optimal transport.



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.



Wojciech Ożański

Mathematical Fluid Mechanics · University of Southern California · s Funding provided by the Charles Simonyi Endowment

Wojciech Ożański's research interests include partial regularity of solutions of partial differential equations arising in incompressible fluid mechanics, and Fourier analysis.



Georgios Pappas

Number Theory, Algebraic Geometry \cdot Michigan State University $\cdot f$ Funding provided by The Bell Companies Fellowship Fund

Georgios Pappas studies Shimura varieties, especially their integral models, and other related moduli spaces useful in number theory and representation theory.



Alexander Perry

Algebraic Geometry · Institute for Advanced Study Funding provided by the National Science Foundation Alex Perry studies algebraic geometry, with a focus on derived categories, Hodge theory, and birational geometry.





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.

Rafael Potrie

Dynamical Systems and Geometry · Universidad de la República, Uruguay · vnf

Minerva Research Foundation Member; additional funding provided by the National Science Foundation

Rafael Potrie's research mainly concerns the topological classification of partially hyperbolic systems in three-dimensional manifolds and its dynamical consequences. Other interests include smooth dynamics, ergodic theory, discrete subgroups of Lie groups, and the geometry of foliations and laminations.

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Robert Robere

Complexity Theory · Institute for Advanced Study Funding provided by the Charles Simonyi Endowment 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.

Daniel M. Roy

Machine Learning · University of Toronto · s Funding provided by the Charles Simonyi Endowment

Daniel Roy is interested in the foundations of machine learning and statistics, statistical decision theory, and statistical learning theory. While at IAS, Roy will likely focus on understanding generalization, particularly the prospect of numerically tight bounds. Roy is also interested in nonstochastic theories that might form a rigorous foundation for statistical practice.



Gintare Karolina Roy

Machine Learning · Institute for Advanced Study · s

Gintare Roy's work spans statistical learning theory, adversarial learning, generative models, and variational inference. Roy's recent focus has been on the problem of explaining empirical performance in deep learning.



Sushant Sachdeva

Algorithms, Optimization \cdot University of Toronto $\cdot v, f$

Sushant Sachdeva's research is focused on the design of fast algorithms for problems ranging from theoretical computer science to machine learning and optimization. During his time at IAS, he hopes to contribute to a theoretical understanding of the interplay of optimization algorithms, generalization, and robustness for artificial neural networks.



Robert Schapire

Machine Learning \cdot Microsoft Research $\cdot f$

Robert Schapire studies theoretical machine learning, including online learning, bandit algorithms, reinforcement learning, and connections to game theory.



Koji Shimizu

Number Theory · University of California, Berkeley Funding provided by the National Science Foundation Koji Shimizu is interested in number theory and arithmetic geometry. He plans to study *p*-adic Hodge theory and local systems on varieties.







Sahil Singla

Optimization · Institute for Advanced Study and Princeton University Funding provided by Eric and Wendy Schmidt

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.

Zhao Song

Theoretical Deep Learning · Institute for Advanced Study AMIAS Member; additional funding provided by the National Science Foundation Zhao Song's research interests are broadly in machine learning, theoretical computer science, and mathematics such as deep learning theory, adversarial examples, reinforcement learning, linear regression, matrix/tensor factorization, linear programs, Fourier transform, longest common subsequence, edit distance, compressed sensing, matrix concentration, and discrepancy.

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 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.



Naser Talebizadeh Sardari

Number Theory · Institute for Advanced Study · s Funding provided by the Charles Simonyi Endowment

Naser Sardari is a number theorist who studies topics related to quadratic forms, strong approximation, and the theory of automorphic forms. Sardari is also interested in the quantum gates model and navigation algorithms with arithmetic generators.



Naftali Tishby

Computational Learning Theory, Statistical Physics of Large-Scale Learning · The Hebrew University of Jerusalem · s Funding provided by Eric and Wendy Schmidt Naftali Tishby will be working on the information theory of deep learning and autoencoders.



Linh Truong

Low-Dimensional Topology · Institute for Advanced Study Linh Truong is interested in low-dimensional manifolds, knot theory, and contact and symplectic geometry. Her research focuses on topological applications of Heegaard Floer homology and Khovanov homology.



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.



Karen Uhlenbeck

Gauge Theory · The University of Texas at Austin · dvp

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



Remy van Dobben de Bruyn

Algebraic Geometry and Arithmetic Geometry · Institute for Advanced Study and Princeton University · vri Funding provided by the Oswald Veblen Fund 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. SCHOO











Jan Vonk

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

Jan Vonk's research is in algebraic number theory. Currently, Vonk is interested in the interactions between *p*-adic families of modular forms and the arithmetic of real quadratic number fields.

Hong Wang

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

Hong Wang is interested in Fourier analysis and related problems. For example, if we know that the Fourier transform of a function is supported on some curved objects, a sphere, or some "curved" collection of discrete points, what can we say about this function? It turns out that such problems are also related to Falconer's distance problem and incidence geometry, and Wang is interested in these connections.

Mengdi Wang

Statistical Reinforcement Learning · Princeton University · s

Mengdi Wang's research focuses on theory and algorithms for provably efficient reinforcement learning. Examples include the minimax statistical complexity for solving a Markov decision process, optimal algorithms and exploration, and dimension reduction and statistical system identification.

Rachel Ward

Applied Mathematics and Machine Learning \cdot The University of Texas at Austin \cdot vnf

Funding provided by the National Science Foundation

Rachel Ward is interested in developing mathematical theory for modern optimization methods in large-scale machine learning. At IAS, Ward hopes to draw from and develop tools in probability and analysis to shed more light on aspects of modern large-scale optimization, such as generalization, overparameterization, adaptivity, and stability.

Fan Wei

Combinatorics, Graph Theory · Institute for Advanced Study Founders' Circle Member; funding provided by Cynthia and Robert Hillas

Fan Wei's interests are centered around combinatorics, graph theory, and applications to theoretical computer science, often involving probabilistic, analytic, and algebraic methods. In particular, Wei has focused on extremal combinatorics (with emphasis on regularity methods and their applications), property testing, random graph models, and graph algorithms.

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Jiaxian Wu

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.



Jingwei Xiao

Langlands Program, Relative Trace Formula · Institute for Advanced Study and Princeton University · vri

Jingwei Xiao is interested in the Langlands program, especially the study of relative trace formulas to relate special values of L-functions with automorphic objects. Xiao's research interests also include generalization of these ideas to other settings, for example arithmetic, functional field, and *p*-adic.



Horng-Tzer Yau

Probability, Mathematical Physics, Random Matrices · Harvard University · s Horng-Tzer Yau works on dynamics of many-particle systems governed by quantum dynamics or stochastic dynamics, with a focus on deriving effective one-body nonlinear equations from such systems. Yau's recent interests also include spectral statistics of random matrices with an emphasis on using stochastic method and Dyson's Brownian motion.



Alexander Yom Din

Representation Theory · Institute for Advanced Study

Alexander Yom Din is studying representation theory: real groups and geometric techniques. Yom Din is also interested in higher categorical matters, character sheaves, and more.



Lai-Sang Young

Dynamical Systems with Applications to the Biological Sciences \cdot New York University \cdot dvp, s

Lai-Sang Young is working to expand the geometric and ergodic theory of chaotic systems to high-dimensional systems, including networks, stochastic dynamical systems, and systems that are out of equilibrium. She is leading a multiyear project to build a biologically realistic computational model of the visual cortex, seeking to unravel the cortical mechanisms behind human vision.









Bin Yu

Statistical Machine Learning and Interdisciplinary Research \cdot University of California, Berkeley $\cdot v$, s

Funding provided by Eric and Wendy Schmidt

Bin Yu's research focuses on the practice, algorithms, and theory of statistical machine learning and causal inference. Her research group, which is engaged with scientists from genomics, neuroscience, and precision medicine, is working to augment empirical evidence for decision-making and investigating methods/algorithms.

Richard Zemel

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

Richard Zemel will focus on how to adapt learning systems to accommodate new classes not seen in training, given only a few examples of each; how automated learning systems can make fair decisions not unduly biased for or against specific subgroups; and synergies between our understanding of neural information processing and computation in deep neural networks.

Yaoyu Zhang

Dynamical Systems · Institute for Advanced Study Funding provided by the Ky Fan and Yu-Fen Fan Membership Fund and the National Science Foundation

Yaoyu Zhang's research focuses on dynamical systems of neural networks and neuronal networks. Specifically, Zhang's work on deep neural networks tries to discover and make explicit the implicit biases underlying their training dynamics. Zhang also uses deep neural networks to facilitate the large-scale modeling of the neuronal networks.

Zhiyuan Zhang

Ergodic Theory and Dynamical Systems \cdot Institute for Advanced Study $\cdot f$ 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.



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. He also works on symplectic fillings using Floer theoretic methods.

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



Jeroen Zuiddam

Algebraic Complexity, Combinatorics, Quantum Information · Institute for Advanced Study

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, 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.

FACULTY



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.



James Stone

Professor · Computational Astrophysics

James Stone has developed novel numerical algorithms that have shaped the field of computational astrophysics and ushered in a new era of precision simulations with a wide range of applications. Stone's research is focused on fluid dynamics, particularly magnetohydrodynamics, for which he has developed some of the most powerful and widely used astrophysical codes. He has contributed groundbreaking methods to address some of the field's most challenging problems, resulting in foundational insights into the nature of giant molecular clouds, the evolution of accretion disks, the process of planetary migration, and the phenomena of radiation transport.



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.

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Michail Tsodyks

C.V. Starr Professor · Theoretical Neuroscience

Misha Tsodyks is a leading theoretical neuroscientist whose research has influenced important areas of neurobiology and the development of a quantitative understanding of brain functioning and human cognitive abilities. His work is focused on identifying neural algorithms that define functions of cortical systems and, in recent years, various aspects of cognitive behavior. From demonstrating the importance of sparsity in neural networks to providing deep insights into the mechanisms of short-term synaptic plasticity and working and associative memory, Tsodyks has devised conceptual models that make quantitative testable predictions for experiments.



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.

FACULTY



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.

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Peter Goldreich

Professor Emeritus · Astrophysics

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



Arnold J. Levine

Professor Emeritus · Biology

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



Ahmed Almheiri

Quantum Field Theory · Institute for Advanced Study · m

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.



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Ravindra Bhatt

Condensed Matter Physics · Princeton University

Ravindra Bhatt's research is in theoretical condensed matter physics, especially dealing with disordered, correlated, and topological systems. Most recently, he has been working on applying computational techniques for fractional quantum Hall and other two-dimensional topological systems.



Christopher Logan Chariker

Computational Neuroscience · Institute for Advanced Study

Christopher Logan Chariker's research is at the interface between dynamical systems and computational neuroscience. Chariker works with networks of interacting neurons viewed as large and complex dynamical systems. Chariker's interests range from rigorous analysis of toy models of neuronal populations to large-scale computational models that are biologically realistic.



Susan E. Clark

Astrophysics · Institute for Advanced Study NASA 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.



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.



Liang Dai

Strong Lensing; Astrophysical Gravitational Waves; Cosmology · Institute for Advanced Study John N. Bahcall Fellow

Liang Dai's latest research has focused on strong gravitational lensing and astrophysical gravitational waves. He is interested in utilizing distant electromagnetic and gravitational wave sources to probe the structure of dark matter on sub-galactic scales through their gravitational influence.



Lorenz Eberhardt

String Theory · Institute for Advanced Study Funding provided by the Della Pietra Family

Lorenz Eberhardt is interested in many areas related to twodimensional conformal field theory. He is studying in particular the AdS3/CFT2 correspondence, worldsheet methods in string theory, W-algebras, and moonshine phenomena.



Jeffrey Fung

Astrophysics · Institute for Advanced Study IBM Einstein Fellow Jeffrey Fung is interested in the theoretical study of planet formation.



Victor Gorbenko

Theoretical Physics · Institute for Advanced Study and Stanford University Marvin L. Goldberger 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.



Felix Haehl

Theoretical Physics · Institute for Advanced Study Funding provided by the U.S. Department of Energy Felix Haehl uses holography and quantum field the

Felix Haehl uses holography and quantum field theory to investigate questions about time-dependent gravitational physics, quantum gravity, and black holes. A recurring theme in his research is thermality and different notions of entropy. S

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Keisuke Harigaya

Particle Physics · Institute for Advanced Study Funding provided by the Raymond and Beverly Sackler Foundation Fund and 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.



Matthew T. E. Heydeman

Theoretical Physics · Institute for Advanced Study and Princeton University

Matthew Heydeman works at the interface of string theory, scattering amplitudes, and the AdS/CFT correspondence. A common theme is the use of algebraic and geometric techniques to find connections between seemingly distinct physical systems.



David A. Huse

Statistical Physics · Princeton University

While at IAS, David Huse plans to work on various questions in many-body quantum dynamics, including entanglement phase transitions under measurement and many-body localization. Huse will also be visiting the systems biology group, which might result in some collaborative project related to biological topics.



Nafiz Ishtiaque

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

Nafiz Ishtiaque studies exactly computable algebraic structures in supersymmetric quantum field theories and their roles in dualities such as holography.



Daniel Steven Kapec

Theoretical Physics · Institute for Advanced Study Founders' Circle Member; funding provided by the Chooljian Family and 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 IBM Einstein Fellow

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.



Joonho Kim

Theoretical Physics · Institute for Advanced Study Funding provided by the National Science Foundation Joonho Kim works on quantum field theory and string theory, with a

particular interest in supersymmetric field theories in diverse dimensions and their non-perturbative dynamics.



Alexei Kitaev

Theoretical Physics · California Institute of Technology · dvp, fAlexei Kitaev's current research is concerned with quantum holography. He has worked on the Sachdev-Ye-Kitaev model and is looking for models with a more complete bulk picture. He is also interested in topological phases of matter.



Simon Knapen

Particle Physics · Lawrence Berkeley National Laboratory Funding provided by the U.S. Department of Energy and the Paul Dirac Fund 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. S

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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.

Petr Kravchuk

Particle Physics · Institute for Advanced Study Funding provided by the Corning Glass Works Foundation Fellowship Fund and 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.

Nima Lashkari

Quantum Gravity, Quantum Field Theory, Quantum Information Theory \cdot Purdue University $\cdot v$, s

Funding provided by the National Science Foundation

Currently, the focus of Nima Lashkari's research is the study of non-perturbative phenomena in quantum field theory and gravity through the quantum lens.

Adam Levine

Quantum Gravity, Quantum Information Theory · Institute for Advanced Study

Funding provided by the National Science Foundation

Adam Levine's research aims to understand the structure of entanglement in quantum field theories and quantum gravity. Levine uses techniques from the study of conformal field theories as well as quantum information theory and AdS/CFT.



Si Li

Mathematical Physics \cdot Tsinghua University $\cdot f$

Si Li is interested in algebraic and geometric aspects of quantum field theory and string theory. Special interests include Calabi-Yau geometry, topological field theory, renormalization theory, and mathematical foundations of quantum field theory.



Elliott H. Lieb

Mathematical Physics · Princeton University · v

Elliott H. Lieb's research interests include mathematical physics and mathematical analysis, especially functional analysis. In physics, his main interests are in condensed matter physics, statistical mechanics, and questions concerning stability of matter and atomic physics.



Hai Lin

Mathematical Physics · Tsinghua University · s

Hai Lin works in string theory, mathematical physics, and quantum field theory.



Jing Luan

Theoretical Astrophysics and Planetary Science · Institute for Advanced Study AMIAS Member

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 influence the evolutions of orbits for planet-satellite and star-planet systems and help to constrain stellar and planetary interiors.

Raghu Mahajan

Quantum Field Theory \cdot Princeton University $\cdot v/f$, s

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.



Kento Masuda

Exoplanets · Institute for Advanced Study *Funding provided by the W. M. Keck Foundation Fund* Kento Masuda works on detection and characterization of transiting

exoplanetary systems using space-based photometry data, with particular emphasis on their geometric architecture and dynamical evolution.

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Lia Medeiros

Astrophysics · Institute for Advanced Study

Lia Medeiros is interested in using extreme astrophysical objects and phenomena to test fundamental theories of physics. Currently, she works on several aspects of the Event Horizon Telescope. Her work primarily focuses on theoretical simulations, but she will sometimes delve into data analysis as well.



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.



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 Infosys Member; additional 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 twodimensional correlation functions and for the black hole information paradox.



Sebastian Mizera

Theoretical Physics · Institute for Advanced Study Founders' Circle Member; funding provided by Carl P. Feinberg Sebastian Mizera's work focuses on aspects of scattering amplitudes in quantum field theory and string theory, as well as their relation to geometry and topology.

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Baurzhan Mukhametzhanov

Theoretical Physics · Institute for Advanced Study

Funding provided by the National Science Foundation and the Adler Family Fund Baurzhan Mukhametzhanov is interested in various aspects of strongly coupled quantum field theories, especially in the context of holography and black hole physics. Mukhametzhanov's recent research has been focused on conformal bootstrap and thermalization.



Elena Murchikova

Astrophysics · Institute for Advanced Study Friends of the Institute for Advanced Study 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.

Sridip Pal



Quantum Field Theory · Institute for Advanced Study Funding provided by The Ambrose Monell Foundation and the U.S. Department of Energy

Sridip Pal is working to deeply understand quantum field theory, a framework to describe nature, from the theory of fundamental particles to collective phenomena in condensed matter, using symmetry-based arguments, especially scale invariance. Currently, Pal is working on two-dimensional conformal field theories and non-relativistic avatars of these theories in different dimensions.



Theoretical Physics · Institute for Advanced Study The Peter Svennilson Membership

Robert Penna is interested in general relativity, fluid dynamics, and mathematical physics. Recent research has focused on the structure of asymptotic symmetries at asymptotic infinity and at black hole event horizons.



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 highenergy astrophysics. 0

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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.

Vladimir Rosenhaus

Theoretical Physics · Institute for Advanced Study William D. Loughlin Member; additional funding provided by the National Science Foundation

Vladimir Rosenhaus is interested in quantum field theory and its intersection with gravity, string, and quantum information theory. His recent work has focused on the Sachdev-Ye-Kitaev model, kinematics of conformal field theory, and integrable deformations of field theories.

Thomas Rudelius

Theoretical Physics · Institute for Advanced Study Roger Dashen 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.

Jorge Eduardo Santos

Quantum Gravity, General Relativity, Gauge-Gravity Dualities · University of Cambridge · jup J. Robert Oppenheimer Visiting Professor

Jorge Eduardo Santos plans to study various aspects of general relativity, quantum gravity, gravitational aspects of string theory, and numerical relativity. He is particularly interested in understanding how to derive the Bekenstein-Hawking entropy of certain supersymmetric black holes with anti-de Sitter asymptotic from field theory considerations.



Marcel Manfred Schmittfull

Cosmology · Institute for Advanced Study 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.

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Shu-Heng Shao

Theoretical Physics \cdot Institute for Advanced Study \cdot m Funding provided by the Simons Foundation Shu Hang Shap has a wide range of interests in the

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.



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.



Wei Song

Theoretical Physics · Tsinghua University

Wei Song works on string theory, holographic dualities, and black hole physics. While at IAS, Song would like to focus on quantum entanglement, the Sachdev-Ye-Kitaev model, irrelevant deformations of conformal field theories, and their connections to black hole physics.





Alexandre Streicher

High Energy Theory · Institute for Advanced Study and Perimeter Institute for Theoretical Physics *Funding provided by the Fund for Memberships in Natural Sciences*

Alexandre Streicher studies quantum gravity, holography, and quantum chaos. He is fascinated by dynamical phenomena and is pursuing a more general understanding of how many internal degrees of freedom can conspire to form higher-dimensional gravity. He has found emergent patterns in operator dynamics, such as the epidemic among internal degrees of freedom.

Rashid Sunyaev

Astrophysics · Max-Planck-Institute für Astrophysik · dvp Maureen and John Hendricks Distinguished 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.

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Yuan-Sen Ting

Astrophysics · Institute for Advanced Study NASA 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.



Robert J. Vanderbei

Astrophysics · Princeton University

Robert Vanderbei uses optimization techniques to make advances in astrophysics. Some examples include designing high-contrast imaging coronagraphs to enable direct imaging of exoplanets and looking for new stable periodic solutions to the n-body problem.



Tejaswi Venumadhav Nerella

Cosmology, Astrophysics · Institute for Advanced Study John N. Bahcall Fellow

Tejaswi Venumadhav'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.





Michael Vogeley

Astrophysics · Drexel University

Funding provided by The Ambrose Monell Foundation

Michael Vogeley's research interests include observational cosmology, cosmic voids, galaxy formation and evolution, statistical analysis of large data sets, active galactic nuclei, and time-series analysis. His current work includes studies of galaxies and Lyman alpha absorbers in cosmic voids and active galactic nuclei variability analyses.

Benjamin Wallisch

Cosmology · Institute for Advanced Study and University of California, San Diego

Bezos Member; additional funding provided by the National Science Foundation

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.

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Barak Zackay

Astrophysics · Institute for Advanced Study Frank and Peggy Taplin Member

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



Ying Zhao

Theoretical 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 2019–20 academic year is "Economy and Society," led jointly by Didier Fassin, James D. Wolfensohn Professor in the School, and Visiting Professor Marion Fourcade, Professor of Sociology at the University of California, Berkeley.

How to study and conceptualize the relationships between economy and society has been a central problem for the social sciences from Adam Smith to Karl Marx, from Max Weber to Karl Polanyi. Over the last few decades, profound transformations in the functioning and regulation of the global economic order, the distribution of income and wealth, and the world of labor have generated new empirical and intellectual challenges. The social sciences have undergone a startling evolution, too, with economists turning to experimental methods and the study of various aspects of social life, including inequality and social mobility, while sociologists, anthropologists, historians, legal scholars, and political scientists have developed new empirical and theoretical approaches to the study of markets, finance, risk, and value. It is at the intersection of these two movements—in the world and in the academy—where we will seek to connect empirical investigations, be they archival, ethnographic, statistical, etc., and theoretical analysis.

Research will bring together the various disciplines of the social sciences and humanities. Topics will include questions related to market structure and economic action, financial cultures and technologies, the rise of automation and algorithms, the moral regulation of nations and individuals, old and new forms of labor and labor organization, the economic and political impact of immigration, the transformation of lifestyles and subjectivities, the valuation of persons and goods, and the place of economics and economists in social and governmental practices. As these phenomena and the way people experience them vary across countries, the projects presented and the scholars who propose them reflect this diversity.

FACULTY



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 health inequalities. 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, the public presence of the social sciences, and a global perspective on crises.



Alondra Nelson

Harold F. Linder Professor

An acclaimed sociologist, Alondra Nelson explores questions in science, technology, and social inequality. Nelson's work offers a critical and innovative approach to the social sciences that is conducive to fruitful dialogue with the many disciplines. Her major research contributions are situated at the intersection of racial formation and social citizenship, on the one hand, and emerging scientific and technological phenomena, on the other. She explores and connects these dimensions in a range of publications, including her two major books, *Body and Soul: The Black Panther Party and the Fight Against Medical Discrimination* (2011) and *The Social Life of DNA: Race, Reparations, and Reconciliation after the Genome* (2016). She is currently at work on a book about science politics in the Obama administration.



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.

FACULTY



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.

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Jeremiah O. Arowosegbe

Political Science · University of Ibadan

Jeremiah Arowosegbe is completing a book manuscript on the colonial constructions of Fulani, Hausa, and other groups ethnically not indigenous to Yorubaland as minorities, through denial of their land rights, using the institutionalized instrumentalities of the colonial ethnographic state. His aim is to account for the continued impacts of such denials for citizenship, political integration, and state fragility in postcolonial Nigeria.



Naor H. Ben-Yehoyada

Anthropology · Columbia University

Naor Ben-Yehoyada's current project follows the perpetual debate about what the Mafia is and how anti-Mafia forms of inquiry (by magistrates, journalists, political activists, police investigators) encounter this dilemma. It follows the recent trial regarding the 1988 murder of a journalist and the several preceding key criminal cases that the trial has revived.



Benjamin Braun

Political Economy · Max-Planck-Institut für Gesellschaftsforschung

When financial capital is scarce, the primary function of finance is to allocate capital to its most productive uses. In a world of capital abundance, by contrast, the role of finance shifts from financing growth to preserving wealth. At IAS, Benjamin Braun will study the political economy of this emerging asset manager capitalism.



Ergin Bulut

Media Studies · Koç Üniversitesi, Istanbul · vWhile at IAS, Ergin Bulut will focus on ethnographic research on Turkey's transnational television series industry.



Başak Can

Anthropology · Koç Üniversitesi, Istanbul

Başak Can's book project, on evidence-making and human rights in post-truth Turkey, examines how the processes and products of medical documentation of violence reckon with human rights and humanitarian politics. Drawing from ethnographic research with medical and legal experts in the field of human rights, the project explores the critical relation between evidence, the logic of proof and denial, and postviolence justice mechanisms. ŝ



Julia Chuang

Sociology \cdot Boston College $\cdot v$, s

Julia Chuang's research uses ethnography to show how the movement of people shapes global economic processes. Her book project on citizenship, labor, and the making of a rural land market examines how China's rural-urban migration creates a dynamic but unsustainable basis for rapid economic development.



Ed Cohen

Modern Thought · Rutgers, The State University of New Jersey Ed Cohen is exploring how and why healing fell out of biomedical favor, and the vital possibilities that healing manifests for our bodies, our collectivities, our environments, and our planetary existence.



Anne-Claire Defossez

Sociology \cdot Institute for Advanced Study \cdot v

At IAS, Anne-Claire Defossez will carry on her research on women's participation in local politics in France. As part of the NOMIS Award project on crisis, she will more specifically work on representative democracy, from a historical and sociological perspective.



Herbert Docena

Sociology · University of the Philippines, Diliman

How does morality shape global politics? Drawing from interviews, archival research, and ethnographic fieldwork at the international climate change negotiations, Herbert Docena's project at IAS examines the ways by which moral judgments about guilt and innocence structured the international community's response to climate change.



Marion Fourcade

Sociology · University of California, Berkeley · vp

Marion Fourcade will study the new forms of social stratification and morality associated with the rise of the personal data economy and the generalization of predictive analytics. This project is generally theoretical; however, it also draws on interviews and observations carried out in the Bay Area of California since 2013.



Alexander R. Galloway

Media Studies · New York University

Alexander Galloway works on issues in philosophy, technology, and theories of mediation. At IAS, he will be completing a book on computation and digitality broadly conceived, from the nineteenth century through to today.

Isabelle Guérin

Socioeconomics · Institut de Recherche pour le Développement, Paris Roger W. Ferguson, Jr., and Annette L. Nazareth Member

Some debts are payable, others are not, and this is particularly the case for women's debts. Drawing on various data collected in South India over the last fifteen years, Isabelle Guérin's project looks at both the political and moral economies of debt and women's bodies, considering material debts, moral debts, and women's bodies as inseparable and co-constitutive.



Fleur Johns

Law · University of New South Wales, Sydney

Fleur Johns is studying the recourse by international institutions, such as the United Nations, to digital data and data science in humanitarian work, and possible effects of this upon legal and political relations and the distribution of power and resources in the sensory economy. At IAS, she will focus on changing ways of figuring a "population" in this context.



Ravi Kanbur

Economics · Cornell University · v, s

Ravi Kanbur is interested in the two-way interaction between economic ideas and economic policy. At IAS, he will explore this interaction through the work of three economists: John Maynard Keynes, W. Arthur Lewis, and Gunnar Myrdal. He will draw parallels with the modern era and the evolution of the discourse around the Washington Consensus.



Robert Karl

History · Princeton University

Robert Karl studies modern Latin American and Caribbean history. Currently, Karl is working on two books on modern Colombia, on the history of injustice and impunity, and on the history of inequality. ш

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MEMBERS AND VISITORS



Webb Keane

Anthropology · University of Michigan

Webb Keane is analyzing the debates and practices through which ordinary people grapple with ethical conflict in their own communities, confront potential moral relativism in everyday life, engage in critique, and find ways to live with the consequences. His research is centered on two questions: What are the ethical bases of political commitments? How can empirical cases of conflict and resolution illuminate the problem of moral relativism?



Eben Kirksey

Cultural Anthropology · Deakin University Friends of the Institute for Advanced Study Member

Eben Kirksey is an American anthropologist who specializes in science and justice. At IAS, Kirksey will conduct research on gene editing, the innovation economy, and social inequality.



Greta LaFleur

Early American Studies · Yale University

Greta Lafleur's current book project considers the relationship between cultural and legal responses to sexual violence and the history of sexuality.





Lena Lavinas

Economics · Universidade Federal do Rio de Janeiro

A new world is emerging as we forge into the twenty-first century, a world in which mass indebtedness has become a marker of social inclusion. Being indebted, and living in debt, may become the norm in this age of financialized capitalism. The aim of Lena Lavinas's research is to examine how entitlements are being transformed from rights into assets to serve as collateral.

Benjamin Lemoine

Sociology, Political Science, Science and Technology Studies · Université Paris-Dauphine Richard B. Fisher Member

Benjamin Lemoine is investigating empirical sites where the scope of powers (and ability to act) of sovereign states are explicitly at stake and embedded in courtrooms and different types of jurisdictions. The aim is to grasp sovereignty in the making, as embodied throughout the settlement of private and public legal infrastructures.



Pascal Michaillat

Economics · Brown University Pascal Michaillat is interested in macroeconomics, public economics, and behavioral economics.



Virag Molnar

Sociology · The New School

Virag Molnar's research explores radical nationalist consumer culture in Hungary, focusing on fashion, heritage tourism, martial arts, and book publishing. It probes how markets serve as important vehicles for promoting new interpretations of national identity and circulating nationalist symbols, thereby fostering popular support for nationalist radicalization.



Law, Criminal Justice · Harvard Law School · v, s

Mitali Nagrecha will study the discourse, priorities, and opportunities of criminal justice reformers in light of rising awareness of social and economic inequality. On first blush, it seems that these changes have not—at least not in all corners—led to a profound reformulation of reform to make broader political economy and human rights arguments. What can we learn?



Susana Narotzky

Social Anthropology · Universitat de Barcelona

Susana Narotzky's book project addresses the relation of human worth and worthlessness to wealth production, distribution, and accumulation. It focuses on how contentious practices of valuation configure, at concrete historical and spatial conjunctures, what becomes valuable for extracting profits.



Federico Neiburg

Social Anthropology · Universidade Federal do Rio de Janeiro

Federico Neiburg is analyzing the contemporary and multi-scalar relationships between economic emergencies and the real economy, two key concepts deployed to realize and govern the economy in contemporary times. He aims to problematize the entanglements between moral values, cognitive crises, and the socio-technical-legal devices marshalled during economic emergencies. m

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Horacio Ortiz

Julia Ott

History · The New School

Z. Fareen Parvez

unequal economy that we live with today.

Sociology · University of Massachusetts Amherst

Anthropology of Money · East China Normal University Funding provided by the Florence Gould Foundation Fund

Horacio Ortiz's project explores theories of money to analyze digital payment systems, financial institutions, and related social practices using big data in China, being attentive to the roles and meanings of money in the transformation of, among others, identities, kinship, friendship, consumption, and monetary institutions in a global space of monetary relations.

Julia Ott's current research examines the origins of venture capital as an idea, as a form of investment, and as an organized industry. Between 1937 and 1982, concerns about venture capital gradually reoriented American political culture in a neoliberal direction, in favor of investors and the wealthy. The result was the less innovative and far more

Fareen Parvez is researching predatory lending as it relates to other

forms of exploitation in low-income urban communities in India. As poor families face downward mobility and regular threats of violence

from "loan sharks," this project investigates the relationships that sustain

long-term indebtedness and how subaltern communities understand











and resist them.

Nathalie Peutz's research focuses on migration, displacement, conservation, and heritage in Yemen and the Horn of Africa. She is currently working on a book project on migration and impasse in Yemen and the Horn of Africa, based on ethnographic fieldwork with Yemeni migrants and refugees in Djibouti.



Adela Pinch

English Literature \cdot University of Michigan $\cdot v$

Adela Pinch's current research project extends her career-long investigation of the relations among literature, philosophy, and social theory in nineteenth-century Britain. At IAS, she plans to complete a book on Victorian fiction and the location of experience.



Sarah Quinn

Sociology · University of Washington

Sarah Quinn researches how culture and politics shape the development of financial markets. She also studies processes of moralization and classification. Her current project examines how Americans make sense of the government, which includes the question of why Americans so frequently misunderstand the role of the government in the marketplace.



Latif Tas

 $\textit{Political Science}\cdot School of Oriental and African Studies, University of London$

Latif Tas is a socio-legal scholar who has conducted fieldwork in Turkey, Syria, Germany, and the United Kingdom. His current research project focuses on the politics of justice, gender, and transnationalism in the Middle East and Europe.



Chloe Thurston

Political Science · Northwestern University

Chloe Thurston's research focuses on American political development and the politics of public policy. Her first book examined the construction of safe and risky mortgage lending and its transformation over the twentieth century. Her current book project focuses on the political causes of asset inequality following the minority rights revolution.



Joëlle Vailly

Sociology, Anthropology · Centre National de la Recherche Scientifique, Paris

Joëlle Vailly's research project focuses on the police and justice system's use of genetic analysis and databases. It aims to analyze these technical and legal innovations by looking at their scientific, political, and moral dimensions in France. These practices lie at the heart of the social configurations that are embedded in contemporary biopolitics.



Wendy Warren

History · Princeton University Frederick Burkhardt Fellowship funded by the American Council of Learned Societies Wendy Warren is studying the intersection of colonialism and carcerality, specifically in seventeenth- and eighteenth-century North America. m

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Frederick F. Wherry

Sociology \cdot Princeton University $\cdot v$

In recent work on rethinking financial citizenship, Frederick Wherry and his collaborators focus on the meanings of credit, debt, dignity, and belonging for those rendered invisible in the financial system. He is now extending financial citizenship to explore economic transactions, understandings of fairness, and the social contract.



Alden H. Young

History, African Studies and Africana Studies · University of California, Los Angeles AMIAS Member

Alden Young's book project takes up the challenge of explaining how some Sudanese intellectuals and businessmen sought to invent a new political economy in order to reconcile themselves to a world of American hegemony and dollar supremacy.

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. 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.



Stephen Burlingham

Art and Science

Stephen Burlingham uses visual arts as a medium to explore awareness through a focus on the tangible-intangible divide. Central for him is the paradox that our experience of self and world is sculpted equally by the seen and the unseen. His current project, on the event horizon, is an artistic approach to this paradox inspired by the visual and cognitive enigma of a black hole.



Luis Campos

History of Science \cdot The University of New Mexico $\cdot f$

Luis Campos is researching the intersecting histories of astrobiology and biological engineering, which both envision "life as it could be." More generally, as a historian of genetics, he is interested in bringing together archival discoveries and contemporary fieldwork at the intersection of biology and society.







Jaco de Swart

History and Philosophy of Science \cdot University of Amsterdam $\cdot f$ Jaco de Swart is researching the history of the dark matter problem. His project studies the development of the problem in tandem with the rise of cosmology and astroparticle physics in the 1970s and 1980s, tracing the coming into being—and disappearance—of scientific objects in astrophysical practice.

Eiko Ikegami

Historical Sociology · The New School

Eiko Ikegami is a sociologist specializing in the historical sociology of Japan. At IAS, she will work on her research program on the various forms of diverse intelligence generally, and her digital research on autistic individuals in virtual worlds. Central to her research project is the use of avatars in virtual environments and the virtual ethnography that allowed her to access the experiences and world views of autistic adults. The current project extends her theoretical interest in network and identity that she developed in previous work.

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?



Susan L. Sugarman

Psychology and Humanistic Studies · Princeton University

Susan Sugarman is studying the development of psychological thinking in the history of thought from Aristotle to Freud, including Western and Eastern texts. Additionally, Sugarman will consider modern psychology and possible alternative directions.

Edwin L. 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.

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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 Physics and Biology

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.



Graham Farmelo

Writer; Fellow, Churchill College, University of Cambridge

Graham Farmelo will be researching his next scientific biography, and drafting the first few chapters. Farmelo will be making much use of the library, and he hopes to benefit from discussions with the late cosmologist's peers and former colleagues.



Carmela Vircillo Franklin

Medieval Latin Literature

Carmela Franklin will be completing a critical edition for the Monumenta Germaniae Historica of the medieval papal chronicle known as the *Liber Pontificalis* on the history of its reception in manuscript and print, from the ninth through the nineteenth century.



Anna Laqua

Institute Visitor

Anna Laqua is investigating the transfer of early modern knowledge between medicine and the theater. The starting point of her research is the historical figure John Bulwer (1606–1656), a London physician and Baconian who had a special interest in theater culture.

DIRECTOR'S VISITORS



Nora Okka

Spolia

Nora Okka, architect, curator, and artist, is continuing her research on the Hellenic spolia in Venice. These extensively recycled building elements in architectural structures, removed from their original context to be reused in a different one, frame the antique and Byzantine heritage of the city.



Sarah Paden

Institute Visitor

Sarah 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.



Lorenza Pescia De Lellis

Institute Visitor

One main focus of Lorenza Pescia De Lellis's current research is the influence of translation in multilingual Swiss society, particularly related to the discourse about energy as realized in Italian and French texts on Swiss websites. Other topics she is currently working on include the linguistic analysis of discourses about immigration in Italian and Swiss Italian newspapers, as well as the Italian language and sexism, with a focus on newspapers and literature.



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.



Nafeesa Syeed

South Asian History

Nafeesa Syeed's research focuses on developments in Kashmir between the 1965 India-Pakistan war and the 1975 signing of the "Kashmir Accord" with India, as well as the impact of conflict on collective and individual memory.

Distinguished Journalism Fellowship

The Distinguished Journalism Fellowship, awarded to leading journalists and editors, aims to protect journalistic freedom, encourage the transmission of novel and nuanced ideas, and advance trust in reporting. It signals IAS's commitment to truth and innovation in all of its forms, including the vital role of a free and informed press. As part of the IAS community-at-large, the Distinguished Journalism Fellow will participate in lectures, panels, and broadcasts and interact frequently with Faculty and Members. With support from the Scully Peretsman Foundation, Joanne Lipman joins the program in 2019 as its inaugural fellow.



Joanne Lipman

Journalist, Author Peretsman Scully Distinguished Journalism Fellow

Joanne Lipman is one of the nation's leading journalists and a bestselling author. A regular CNBC contributor, Lipman previously served as Chief Content Officer at Gannett Co., Inc., and as Editor-in-Chief at USA Today. Lipman also served as the first female Deputy Managing Editor of the Wall Street Journal, where she created "Weekend Journal" and "Personal Journal," and oversaw creation of the Saturday edition. While at IAS, Lipman will investigate the impact of machine learning and artificial intelligence on the media and on journalism specifically. She will also continue her work on gender in the workplace, and engage with scholars in the School of Social Science for its theme year on "Economy and Society."

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, begins his second appointment in 2019–20, 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 his opera *prisoner of the state*, which premiered in June 2019 with the New York Philharmonic; 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; *anatomy theater*, an opera written in collaboration with visual artist Mark Dion; *the public domain*, a commission from Lincoln Center for one thousand amateur singers; and *the loser*, an opera 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.

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