IAS | INSTITUTE FOR ADVANCED STUDY

Faculty and Members
2015–2016

Contents

Introduction

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

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

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

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

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

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

Flexner's vision has been maintained by his successors Frank Aydelotte (1939), J. Robert Oppenheimer (1947), Carl Kaysen (1966), Harry Woolf (1976), Marvin L. Goldberger (1987), Phillip A. Griffiths (1991), and Peter Goddard (2004). In July 2012, Robbert Dijkgraaf became the Institute's ninth Director.

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

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

School of Historical Studies

Administrative Officer: Marian Gallagher Zelazny

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

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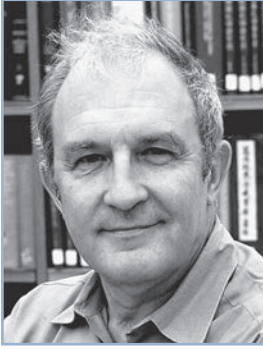
Yve-Alain Bois
Professor · Art History

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

Angelos Chaniotis
Professor · Ancient History and Classics

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

Nicola Di Cosmo
Luce Foundation Professor in East Asian Studies · East Asian Studies

Nicola Di Cosmo's research focuses on the relations between China and Inner Asia from prehistory to the early modern period. He is interested in the history and archaeology of China's northern frontiers, cultural contacts between China and Central Asia, and the military, political, and social history of Chinese dynasties of Inner Asian origin. His most recent works explore the use of proxy data from climatology and other palaeosciences in the study of the history of China and Central Asia, with special reference to early Eurasian nomads, the Mongol empire, and the Qing dynasty.

Patrick J. Geary

Professor · Medieval History

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

Jonathan Haslam

George F. Kennan Professor · International Relations

Jonathan Haslam is a leading scholar on the history of thought in international relations and the 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.

Jonathan Israel

*Andrew W. Mellon Professor* · Modern European History

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

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 centuries) with a focus on reconstructing the textual heritage and the intellectual import of the Islamic intellectual world, from Iran and Central Asia to Turkey and Spain. She is also engaged in a comprehensive study of the Muslim reception of the Bible, a topic on which she has published extensively.
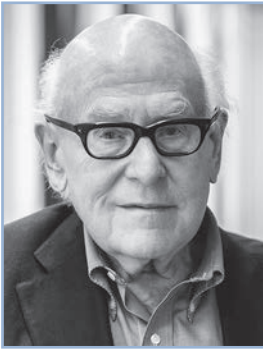
Glen W. Bowersock

*Professor Emeritus* · Ancient History

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

Caroline Walker Bynum

*Professor Emerita* · European Medieval History

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

Giles Constable

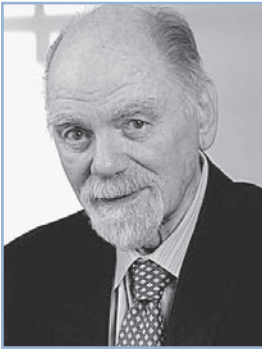*Professor Emeritus* · Medieval History
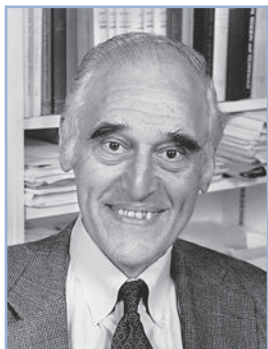
The medievalist Giles Constable is the author or editor of more than twenty books in the area of medieval religious and intellectual history concerning, among other subjects, the origins of monastic tithes, Peter the Venerable, the people and power of Byzantium, medieval religious and social thought, 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 is forthcoming, and he is at work on a short book on early medieval monasticism.

Christian Habicht

Professor Emeritus · Ancient History

Christian Habicht is among the leading historians of the Hellenistic period. He is an authority on Greek epigraphy and on the history of Athens between Alexander the Great and Augustus. He has published books on the Hellenistic ruler-cults, on the Maccabees, on Cicero, and on Pausanias. He has edited hundreds of previously unpublished inscriptions from important sites in Greece and Asia Minor. To a new bilingual edition of Polybius, he contributed the introduction and explanatory notes; six volumes were published in 2010–12. An updated English edition of his doctoral dissertation, submitted in German in 1951, is scheduled to be published as "Divine Honors for Mortal Men in Greek Cities: The Early Cases" by Michigan Classical Press.

Irving Lavin

Professor Emeritus · Art History
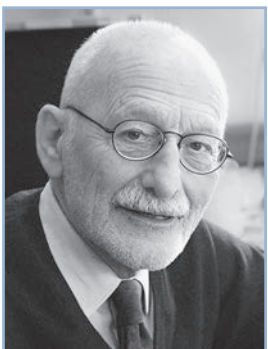
Irving Lavin is one of America's most distinguished art historians. He has written extensively on the history of art from late antiquity to modern times, including numerous studies on Italian painting, sculpture, and architecture of the Renaissance and Baroque periods. His interests have focused primarily on the correlation between form and meaning in the visual arts. The first two volumes of a projected six-volume edition of his collected works have been published as *Visible Spirit: The Art of Gianlorenzo Bernini* (2007–09), while the third volume has appeared as *Bernini at St. Peters: The Pilgrimage* (2012). A gathering of his essays on modern art has appeared in Italian as *L'Arte della storia dell'arte* (2008).

Peter Paret

*Professor Emeritus* · Modern European History

Peter Paret is a cultural and intellectual historian with particular interest in the interaction of war and society since the eighteenth century, how historians integrate war with their interpretation of other historical forces, and the relationship between tradition and modernism in the art of nineteenth and twentieth-century Europe. His most recent books are *Myth and Modernity: Ernst Barlach's Drawings on the Nibelungen* (2012), written with Helga Thieme, which discusses a modern interpretation of a medieval myth as a document of German history in the 1920s and '30s, and *Clausewitz in His Time* (2014), essays in the cultural and intellectual history of thinking about war.

Heinrich von Staden

Professor Emeritus · Classics and History of Science

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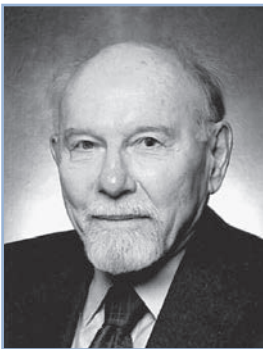
Morton White

Professor Emeritus · Philosophy and Intellectual History

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

Wendi Adamek
Chinese Buddhism · University of Calgary
The Starr Foundation East Asian Studies Endowment Fund Member

Wendi Adamek is researching a sixth-century Chinese text on buddha-nature soteriology that uses the Nirvana-sūtra characterization of *nirvāṇa* as permanence, joy, self, and purity. Her work approaches this rubric and its instantiations as important historical artifacts that contribute to contemporary investigation into theories of agency and efficacy.

Gianfranco Agosti
Greek Epigrams in Late Antiquity · Università degli Studi di Roma, La Sapienza · *s*
Funding provided by the Patrons' Endowment Fund

Gianfranco Agosti is pursuing a comprehensive study of the social and cultural role of inscriptional Greek poetry in late antiquity. He plans to reexamine inscriptional poems as literature, considering their social role as vehicles of display and diffusion of learning in the urban space of late antique Eastern Mediterranean cities.

Hassan Farhang Ansari
Intellectual and Legal Studies · Institute for Advanced Study
Elizabeth and J. Richardson Dilworth Fellow

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

Jeffrey Barash
History of Political Thought · Université de Picardie Jules Verne, Amiens
Friends of the Institute for Advanced Study Member

Jeffrey Barash's project concerns the genesis and historical transformations of political myth in its specifically modern forms. It aims to elucidate the plastic character of myth and of its political articulations throughout the modern period in order to identify the unique significance and ongoing potency of myth in our time.

Marisa Bass
Renaissance Art · Washington University in St. Louis
Funding provided by the Herodotus Fund

Marisa Bass is writing a microhistory of the Dutch Revolt and its impact on the art and intellectual culture of the later sixteenth-century Netherlands. Her study centers around the artist Joris Hoefnagel, his itinerant career, his encyclopedic inquiry into the natural world, and his psychological response to wartime upheaval.

Sarah Bassett

Late Roman and Byzantine Art · Indiana University
Funding provided by The Andrew W. Mellon Foundation

Sarah Bassett plans to study the concept of style in the late antique visual arts. She will first explore the definition of that style as it emerged in nineteenth-century intellectual and artistic circles, and then examine ancient approaches to this material as evidenced in late antique literary sources.

Joshua Billings

Classics · Princeton University · *s*

Joshua Billings is investigating drama and intellectual culture in Athens at the end of the fifth century B.C.E. His book project considers links between tragedy and comedy on one hand, and currents in philosophy, rhetoric, and historiography on the other, in relation to concepts of enlightenment.

Thomas Biskup

Political History, History of Science · University of Hull
Gerda Henkel Stiftung Member

Thomas Biskup's project combines the history of political culture and the history of science to examine a global web of exchanges and dependencies in the field of natural history, which linked Germany, Britain, and parts of America, Africa, and Asia in the eighteenth century. Britain's European and transoceanic interconnections will be highlighted, as will the patterns by which Germans interacted with the extra-European world.

Mark Evan Bonds

Aesthetics and Philosophy of Music · University of North Carolina at Chapel Hill
Edward T. Cone Member in Music Studies

Perceptions of the relationship between a composer's works and innermost self have changed radically since the Enlightenment. The Romantic paradigm of music as emotional autobiography contrasts starkly with earlier and later understandings of expression as artifice. Mark Bonds is examining the cultural, philosophical, and economic forces that have driven these changes.

Courtney Booker

Carolingian History, History of Drama · The University of British Columbia
Funding provided by the Fund for Historical Studies

Courtney Booker's research investigates the awareness and understanding of drama in the early Middle Ages—a period allegedly devoid of formal theater, but highly sensitive to affectation and enactment, and urgently concerned with discerning the interior, scrutinizing conscience, and finding truth. He plans to explore the prevailing function of ancient drama in this early medieval forensic pursuit.

SCHOOL OF HISTORICAL STUDIES

Stephen Burnett

Early Modern Jewish History · University of Nebraska-Lincoln
Elizabeth and J. Richardson Dilworth Fellow

Stephen Burnett is working on a book that focuses on arguments presented in Luther's three polemical treatises from 1543—*On the Jews and their Lies, On the Ineffable Name, and On the Last Words of David*—and Luther's intended purpose in writing these works, taken in the context of his career and the politics of the time.

Daniela Caglioti

Modern European History · Università degli Studi di Napoli Federico II · *f*
Elizabeth and J. Richardson Dilworth Fellow

Daniela Caglioti is preparing a transnational history of the treatment of enemy aliens during and in the aftermath of the First World War. In particular, her project will explore the ways in which nation and ethnicity affected citizenship and property rights.

Matthew Canepa

Ancient Iranian Art and Archaeology · University of Minnesota · *s*

Matthew Canepa is working on a multivolume project on art, architecture, and landscapes of power in ancient Iran. At IAS, he plans to research the transformation of the Iranian royal image between Alexander and Islam.

Janet Chen

History of Modern China · Princeton University
Frederick Burkhardt Fellowship funded by the American Council of Learned Societies

Janet Chen's current research focuses on the creation of a spoken national language in China and Taiwan. Her project explores how ordinary people learned to speak "Mandarin" and how the multiple realities of a national language intersected with their lives.

Wen-Shing Chou

Buddhist Art and Architecture · Hunter College, The City University of New York
The Andrew W. Mellon Foundation Fellowships for Assistant Professors

Wen-shing Chou is examining the transcultural artistic and literary productions surrounding the sacred mountain range of Wutai Shan in northern China during the Qing dynasty, when the mountain range became a unique site of shared religious devotion, diplomacy, and trade among the multiethnic constituents of the empire.

Albrecht Diem

Medieval Monastic Studies · Syracuse University

Albrecht Diem is investigating the role of normative texts in organizing and ordering closed communities and shaping collective identities. He plans to focus on the development of Western monasticism between the fifth and ninth centuries and particularly on the corpus of roughly thirty monastic rules produced in this period.

Carolyn Eichner

Women/Gender in Modern Europe and Empire · University of Wisconsin–Milwaukee

Carolyn Eichner works on feminism and radical politics in nineteenth-century France and empire. Her current project examines the name as a site of political engagement and of personal and collective identity. It explores the evolution of state and customary naming regulations, and subject populations' navigations of these restrictions.

Nahyan Fancy

Premodern Islamic Science and Medicine · DePauw University · *f*
Ralph E. and Doris M. Hansmann Member

Nahyan Fancy is working on the theoretical and practical sections of eleven Arabic medical commentaries produced between 1200 and 1520 in Islamic societies. These commentaries have been ignored thus far by medical historians. His project aims not only to chart the evolution of medical discussions over the three centuries, but also to situate them within the intellectual, institutional, and social contexts of these societies.

Rozaliya Garipova

Islamic History · University of Pennsylvania · *f*
Funding provided by the Fund for Historical Studies

Rozaliya Garipova's research focuses on Muslim communities of the Volga–Urals in the Russian Empire. She will be investigating the transformation of Islamic law and religious authority in this region during the nineteenth century.

Eric Goldberg

Early Medieval Europe, Late Antiquity · Massachusetts Institute of Technology
George William Cottrell, Jr., Member

Eric Goldberg studies the history of early medieval Europe and the Carolingian Empire. At IAS, he will research hunting and identity in the Frankish world, from 312 to 987 C.E.

SCHOOL OF HISTORICAL STUDIES

Bryna Goodman

Modern Chinese History · University of Oregon · *s*
The Starr Foundation East Asian Studies Endowment Fund Member

Bryna Goodman is examining Chinese understandings of economics and culture, from early translations of Western economics to a 1921 financial bubble and its aftermath. Her project will map the translation of finance capitalism in theory and practice, and show how economic information and new political and financial institutions took shape in everyday consciousness.

Margaret Graves

History of Islamic Art · Indiana University, Bloomington
Funding provided by the Herodotus Fund

Margaret Graves is exploring the intellectual and representational functions of ornament in the plastic arts of the medieval Islamic world. She plans to investigate the use of architectural forms and motifs on three-dimensional objects.

Christine Guth

Material Culture and Design History · Royal College of Art · *f*
Funding provided by The Andrew W. Mellon Foundation

Christine Guth's current research seeks to better understand early modern Japanese society (1600–1868) through the lens of material culture. Her study will explore how the meanings of things, and changing attitudes toward materials and materiality, were constructed in dynamic relationship to the physical properties of materials and changing technologies.

Najam Haider

Islamic Studies · Barnard College · *s*
Edwin C. and Elizabeth A. Whitehead Fellow

Najam Haider studies the links between Islamic historical writing and the Classical rhetorical tradition. Muslim historians depicted events, whose broad parameters were well known, in a rhetorical manner, making them relevant to contemporaneous circumstances. This maneuver was understood by an audience that accepted a degree of narrative flexibility in historical writing.

Julia Hairston

Early Modern Italian Literature · University of California, Rome · *s*
Felix Gilbert Member; additional funding provided by the Hans Kohn Membership Fund

Julia Hairston's research focuses on gender in early modern Italy. At IAS, she will be writing an intellectual biography of Tullia d'Aragona, a sixteenth-century writer, musician, philosopher, and courtesan.

Matthew Hopper

African History · California Polytechnic State University, San Luis Obispo · *f*
William D. Loughlin Member

Matthew Hopper studies the history of slavery and the African diaspora in the Indian Ocean. He is researching the history of liberated Africans captured at sea by the British Royal Navy in the western Indian Ocean between 1858 and 1888 and relocated to seven outposts between Bombay and Cape Town.

Paulin Ismard

Ancient Greek History · Université Paris 1 Panthéon-Sorbonne
The Gladys Krieble Delmas Foundation Member

Paulin Ismard plans to examine legal aspects of chattel slavery in Greek cities during the classical and Hellenistic periods. Drawing upon recent studies in anthropology and history that have expanded our understanding of slavery structures, he aims to explore economic roles and legal structures related to slavery in order to further illuminate the great complexity of Greek civic societies during these periods.

Willem Jongman

Roman History, Economic History · University of Groningen · *f*
Funding provided by The Andrew W. Mellon Foundation

The Roman Empire was the largest economic system the world had ever seen, and remained so for many centuries. At IAS, Willem Jongman is examining the following questions: how do we measure the Empire's economic performance, and how do we explain its successes and failures?

Hodong Kim

History of the Mongol Empire · Seoul National University
Funding provided by the Fund for Historical Studies

Hodong Kim is exploring a new perspective on the history of the Mongol Empire (ca. 1206–1388), focusing on its unity and expansiveness. By also emphasizing the Mongol perception of the empire, he hopes to overcome regional perspectives, whether they be Chinese, Islamic, or European.

Michael Kulikowski

Late Antiquity/Early Middle Ages · The Pennsylvania State University
Funding provided by the Fund for Historical Studies

Michael Kulikowski is a historian of the later Roman Empire, working on the second of a four-volume history and commentary on the Latin chronicle tradition from its beginnings to the sixth century C.E. At IAS, he will be researching the earliest chronicles, calendars, fasti, and consularia (annotated and unannotated consular lists respectively).

SCHOOL OF HISTORICAL STUDIES

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Michael Kunichika

Russian and Soviet Culture · New York University
Willis F. Doney Member; additional funding provided by the Herodotus Fund

Michael Kunichika pursues interdisciplinary approaches to the study of Russian and Soviet literature and culture, with a particular focus on the modernist period and the cinema of the silent era. His project will examine a range of discursive and visual materials—from novels, films, art historical accounts, and cartographic practices—in considering the values ascribed to archaeology in late socialist culture.

Rhodri Lewis

Literary and Intellectual History · University of Oxford
Willis F. Doney Member

At IAS, Rhodri Lewis plans to complete work on an edition and translation of Francis Bacon's early philosophical writings. Written all but exclusively in Latin, these texts comprise the first drafts of the systematic reform of natural philosophy and logic that Bacon would propose in his *Instauratio Magna* (1620), the most famous portion of which is the *Novum Organum*.

Eugenio Menegon

Late Imperial China · Boston University · *f*
Agnes Gund and Daniel Shapiro Member

Eugenio Menegon is reconstructing the political networking, economic infrastructure, and daily life of European missionary scientists and technicians at the Qing court in the long eighteenth century. This research contributes to a deeper understanding of the informal dimension of court politics, and of the global connections between the Qing court, the Catholic missions, and the maritime networks centered on Macao and Canton.

Jason Moralee

Late Antiquity · University of Massachusetts, Amherst
The Gladys Krieble Delmas Foundation Member

Jason Moralee studies the physical and imaginative transformations of memorial spaces. His project examines the multiple afterlives of Rome's Capitoline Hill from the third to the twelfth century and what these can tell us about the formation and transmission of knowledge about the Roman cityscape in late antiquity and beyond.

Negin Nabavi

Modern Iranian History · Montclair State University · *s*
Elizabeth and J. Richardson Dilworth Fellow

Negin Nabavi's project explores the shaping of publics and public spheres in the context of late nineteenth- and early twentieth-century Iran. It focuses on a range of public spaces that emerged in Iran as part of an unfolding modernity, and examines how they came to be and changed over time.

Martti Nissinen

Assyriology, Biblical Studies · University of Helsinki · *s*

Martti Nissinen is investigating the social, political, economic, and religious role and impact of the Western population (Aramean, Phoenician, Israelite, and others) in the Assyrian mainland during the Neo-Assyrian period (ninth through seventh century B.C.E).

Giuseppe Pezzini

Latin Literature · University of Oxford · *s*
Funding provided by the Fund for Historical Studies

Giuseppe Pezzini is preparing an edition of the *Self-Tormentor* by Terence, for centuries a most popular Latin playwright. An African by birth, Terence's work is an early attempt at providing Rome with a literature to compete with Greece's, as well as containing brilliant character portrayals and raising universal questions about the relationship between generations and cultures.

Andrea Piras

Iranian Studies · Università Degli Studi Di Bologna · *s*
Funding provided by the Fund for Historical Studies

Andrea Piras's project deals with Manichaeism and focuses on reconstructing a pattern of uses of religious images involving therapeutic aims. The use of images is a characteristic of Manichaean book art and points to an early Gnostic background of symbolic visualizations and didactic implications.

Maurice Pomerantz

Arabic Literature/Cultural History · New York University Abu Dhabi
The Andrew W. Mellon Foundation Fellowships for Assistant Professors

Maurice Pomerantz is writing a literary history of Arabic picaresque tales. His research examines how the imaginary itineraries of these tales' rogue characters reflect the intellectual, social, and economic networks of Muslim merchants in North Africa, the Middle East, and South Asia from the eleventh to the nineteenth century C.E.

Eric Ramírez-Weaver

Medieval Art History · University of Virginia
The Andrew W. Mellon Foundation Fellowships for Assistant Professors

Eric Ramírez-Weaver specializes in the joint histories of medieval art and astronomy. This year, he is studying Bohemian visualizations of the heavens, drafting a study of astrology, cosmology, and philosophy in late medieval Prague, while exploring how books at Wenceslas IV's court pictorialized strategies of knowledge, power, and control.

SCHOOL OF HISTORICAL STUDIES

Camille Robcis

Intellectual History · Cornell University · *s*
AMIAS Member

Camille Robcis is writing a history of institutional psychotherapy, a psychiatric reform movement born after World War II. Anchored in Marxism and in Lacanian psychoanalysis, institutional psychotherapy advocated a radical restructuring of the asylum, shaping clinics throughout the world and influencing thinkers and activists such as François Tosquelles, Jean Oury, Félix Guattari, Frantz Fanon, and Georges Canguilhem.

Felipe Rojas

Classical Archaeology · Brown University
The Andrew W. Mellon Foundation Fellowships for Assistant Professors

Felipe Rojas will be completing a book that deals with how and why people in the past imagined their own past through the physical and intellectual manipulation of material remains. Specifically, he examines the interactions of the inhabitants of Greek and Roman Anatolia with objects, monuments, and landscapes from the Bronze and Iron Ages.

Maria de Lurdes Rosa

Medieval/Early Modern European History · Universidade Nova de Lisboa · *f*
Funding provided by the Herodotus Fund

Maria de Lurdes Rosa plans to examine largely unknown or unstudied archival materials from noble/elite families dating from the fourteenth through the nineteenth centuries, in order to reconstruct "documentary information" that will shed light on aspects of these families' lives, including wealth management, inheritance conflicts, literacy, and symbolic practices.

Els Rose

Medieval Latin, Medieval Liturgy · Utrecht University · *f*
Funding provided by the Herodotus Fund

Els Rose studies medieval liturgical practices, specifically the language of prayer in the early medieval West. At IAS, she plans to examine the evidence of liturgical sources to study Christian corporate prayer in the interplay of word and ritual and to explore the dynamics of ritual literacy in this period.

Rebekah Rutkoff

Cinema Studies · Institute for Advanced Study
Funding provided by the Fund for Historical Studies

Rebekah Rutkoff's research explores the crossroads of cinema studies, theories of magic, and ancient and contemporary discourses about dreaming and cure. She is currently writing about the American avant-garde filmmakers Robert Beavers and Gregory Markopoulos.

Emmanuelle Saada

Law and Colonialism · Columbia University · *f*
Hans Kohn Member

Emmanuelle Saada's research concerns the invention of the "native" in Algeria and, more broadly, in the French Empire throughout the nineteenth century. This investigation will show that the couplet "European" and "Native" was the product of a fifty-year process of categorization in which law played the central role.

Carlo Scardino

Graeco-Arabica · Heinrich-Heine-Universität Düsseldorf
Martin L. and Sarah F. Leibowitz Member

Carlo Scardino is researching the process of cultural transfers between Greco-Roman late antiquity and early medieval Arabic culture. The goal of this research is the completion of a critical edition with translation of the Arabic translations of Anatolius Berytius's Greek agricultural compilation (fourth to fifth century C.E.), whose Greek original is lost.

Daniel Smail

History and Anthropology of Medieval Southern Europe · Harvard University · *s*
Friends of the Institute for Advanced Study Member

Daniel Smail works on the history and anthropology of Mediterranean societies between 1100 and 1600. This year, he is developing a "documentary archaeology" of later medieval Europe, using postmortem inventories and other sources for material culture.

Paul Smith

Chinese History · Haverford College · *f*
Funding provided by the Herodotus Fund

Paul Smith studies the intersection of war and politics in China from the first major Sino-Tangut war of 1040 to Yue Fei's execution in 1142. His project highlights the impact on literati control and the rise of military entrepreneurs through successive wars of necessity (the 1040s), choice (1068–1125), and desperation (1127–1142).

Mingwei Song

Modern Chinese Literature · Wellesley College · *s*
Elizabeth and J. Richardson Dilworth Fellow

Mingwei Song plans to explore the political, aesthetic, ethical, and epistemological connotations of the posthuman, a central literary motif in twenty-first-century Chinese fiction, particularly science fiction, which challenges the conventional ideas of humanity, culture, and technology.

SCHOOL OF HISTORICAL STUDIES

Deborah Steiner

Classics/Ancient Greek Literature · Columbia University · *f*
Funding provided by the Hetty Goldman Membership Fund

Deborah Steiner's current research explores two aspects of chorality in the archaic and early classical Greek literary and visual sources: first, the paradigmatic choruses deployed by poets and artists to depict singing and dancing ensembles; and second, the technological, architectural, and religious practices on which these representations drew.

Noël Sugimura

History of Enlightenment Cultures · Georgetown University
Funding provided by the Herodotus Fund

Noël Sugimura's current research focuses on John Milton and eighteenth-century literature and culture. It explores how, on the one hand, early eighteenth-century English readers of Milton sought to contain the dangerous radicalism to which Milton's poetry tends, and how, on the other, their response to the aesthetics of the poetry inadvertently proved destructive to the clerical conservatism that their readings otherwise promoted.

Kenneth Swope

Chinese Military and Social History · University of Southern Mississippi · *f*
Funding provided by the Patrons' Endowment Fund

Kenneth Swope's project focuses on the traumatic Ming-Qing dynastic transition in seventeenth-century China by examining the peasant rebel Zhang Xianzhong's reign of terror in Sichuan province. Using rare contemporary materials and applying techniques from trauma and memory studies and anthropology, Swope will provide a detailed narrative analysis of these events and how they have been remembered.

Meredith Terretta

African History, Law and Transnational Activism · University of Ottawa
Louise and John Steffens Founders' Circle Member

In her current project on transnational legal and humanitarian activism in Africa from the 1920s to the 1970s, Meredith Terretta focuses on the ways activist lawyers invoked international and humanitarian law to claim rights for colonial populations under European administration, particularly in League of Nations mandate and United Nations trust territories.

Stephen Tracy

Greek History and Epigraphy · The American School of Classical Studies at Athens · *v*

Stephen Tracy is helping English and Australian colleagues prepare a new edition of Athenian decrees of the late fourth to third 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."

f First Term · *s* Second Term · *v* Visitor

John Tresch

History of Science and Technology · University of Pennsylvania · *f*
Friends of the Institute for Advanced Study Member

John Tresch is studying Edgar Allan Poe's writings on science and technology. In the 1830s and 40s, scientific reformers forged centralized, explicitly imperial institutions to put down quackery and build the United States' technical infrastructure, while in the press and popular forums, unruly, heterodox visions of knowledge and nature flourished. Poe's natural philosophy and fiction illuminate these worlds.

Karina Urbach

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

Karina Urbach works on the role of elites in the international relations of Europe in the first half of the twentieth century. Her new project focuses on the impact that former Nazis had on German society after 1945.

William Van Andringa

Roman Archaeology and Religion in Late Antiquity · Université Lille 3 · *s*
Funding provided by the Florence Gould Foundation Fund

Starting from the results of recent excavations that show important changes in the pagan sanctuaries of the Roman West, even before the conversion of Constantine and the rise of Christianity to official religion, William Van Andringa plans to reassess the fundamental problem of religious transformations in late antiquity.

Marga Vicedo

History of Science · University of Toronto
Willis F. Doney Member

Marga Vicedo is a historian of science interested in explanations of human behavior. Weaving the analysis of scientific debates about autism with the history of a mother and her autistic daughter, her current book aims to situate changing views about autism within debates about the nature of emotions, science, and human nature.

James Webb, Jr.

Historical Epidemiology · Colby College · *f*
Willis F. Doney Member

James Webb's project is a broad, first-generation exploration of the global environmental history of enteric diseases and the changing cultural, biomedical, and public health practices that have influenced the transmission of pathogens.

SCHOOL OF HISTORICAL STUDIES

School of Mathematics

Administrative Officer: Mary Jane Hayes

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

Ian Agol of the University of California, Berkeley, will be the School's Distinguished Visiting Professor during the 2015–16 academic year. Agol will lead a special program on geometric structures on 3-manifolds. The goal of the program is to investigate further the recent advances connected to such structures and to understand better relations between them.

Other programs associated with the School are the Institute for Advanced Study/Park City Mathematics Institute (PCMI), an innovative program integrating mathematics research and mathematics education, and the Program for Women and Mathematics, jointly sponsored with Princeton University, which brings together research mathematicians with women undergraduate and graduate students for an intensive ten-day workshop held on campus.

Jean Bourgain
IBM von Neumann Professor

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

Helmut Hofer
Professor

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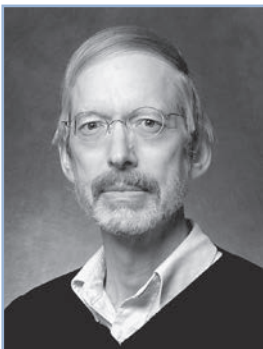
Robert MacPherson
Hermann Weyl Professor

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

SCHOOL OF MATHEMATICS

Peter Sarnak
Professor

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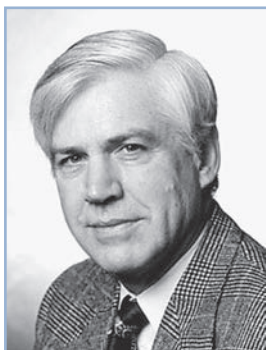
Thomas Spencer
Professor

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

Richard Taylor
Robert and Luisa Fernholz Professor

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

Vladimir Voevodsky
Professor

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

Avi Wigderson
Herbert H. Maass Professor

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

Enrico Bombieri
Professor Emeritus

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

SCHOOL OF MATHEMATICS
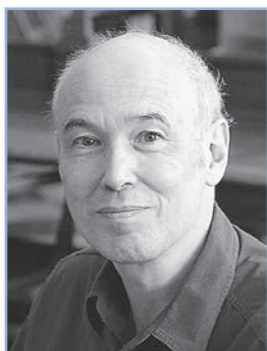
Pierre Deligne
Professor Emeritus

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

Phillip A. Griffiths
Professor Emeritus

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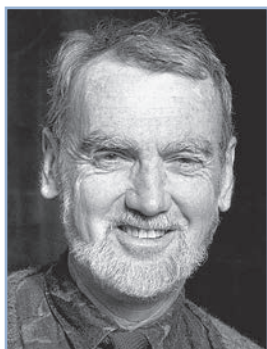
Robert P. Langlands
Professor Emeritus

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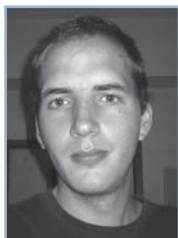
Karim Alexander Adiprasito

Combinatorics in Algebra, Geometry, and Topology · Institute for Advanced Study · *s*
Funding provided by the National Science Foundation

Karim Adiprasito is interested in the topology of subspace arrangements, the generalization and application of Stanley-Reisner theory, and deformation spaces of combinatorial objects (including framework rigidity and the relation to toric algebraic geometry).

Ian Agol

3-Manifold Topology · University of California, Berkeley · *dvp*
Funding provided by the Charles Simonyi Endowment

Ian Agol studies 3-manifold topology principally in relation to hyperbolic geometry.

Benedikt Ahrens

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

Benedikt Ahrens is interested in logic, category theory, and the formalization of mathematics in computer proof assistants. During his stay at the IAS, he will work on models of type theory in univalent foundations.

Noga Alon

Combinatorics · Tel Aviv University · *vp, f*

Noga Alon is working on questions in discrete mathematics and theoretical computer science. His current research focuses on problems in extremal and probabilistic combinatorics, information theory, combinatorial number theory, and discrete probability. At the Institute, he plans to combine combinatorial tools with algebraic and probabilistic techniques.

Nils A. Baas

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

Nils Baas plans to study higher structures in topology and geometry, especially related to cobordism categories and higher categories. In systems biology, he plans to study topological analysis of biological data.

SCHOOL OF MATHEMATICS

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

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Christopher Beck

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

Christopher Beck has published on time-space tradeoffs in proof systems and sampling lower bounds for circuits. At IAS, his research deals with proving lower bounds against proofs and circuits of various kinds, as well as some other models of computation.

Valentin Blomer

Number Theory · Georg–August–Universität Göttingen · *vnf*
Funding provided by the National Science Foundation

Valentin Blomer is an analytic number theorist with a strong interest in the arithmetic, analytic, and geometric aspects of automorphic forms. He plans to continue his work on automorphic forms for higher rank groups and their associated L-functions. His more arithmetic interests include points of bounded height on algebraic varieties.

Danny Calegari

3-Manifolds, Group Theory, Dynamics · The University of Chicago · *f*
Funding provided by the Ellentuck Fund and the Oswald Veblen Fund

Danny Calegari is interested in extremal problems in topology and how their solution often comes from geometry—either hyperbolic geometry (negative curvature) or symplectic geometry (causal structures).

Ana Caraiani

Number Theory · Institute for Advanced Study and Princeton University · *vri*
Funding provided by the National Science Foundation and the Minerva Research Foundation Membership Fund

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

Daryl Cooper

Topology · University of California, Santa Barbara · *f*
Funding provided by the Ellentuck Fund

Daryl Cooper is studying real projective structures on manifolds, particularly compactifications of the moduli and Teichmüller spaces of deformations of properly convex structures by geometric objects.

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

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Octav Cornea

Symplectic Topology · Université de Montréal

Octav Cornea is working on different aspects of the topology of Lagrangian submanifolds, in particular, Lagrangian cobordism and its relations to Floer theory and to the Fukaya category.

Nathan Dunfield

Mathematics · University of Illinois · *f*
Funding provided by The Bell Companies Fellowship Fund and the Giorgio and Elena Petronio Fellowship Fund II

Nathan Dunfield works on topology and geometry of 3-manifolds and related topics, as well as algorithms and experimental mathematics.

Alex Eskin

Dynamical Systems and Ergodic Theory · The University of Chicago · *f*
Funding provided by The Bell Companies Fellowship Fund

Alex Eskin is studying dynamical systems of geometric origin, in particular on locally symmetric spaces and on the moduli space of Riemann surfaces. He is mostly motivated by applications to geometry and number theory.

John Etnyre

Contact and Symplectic Topology · Georgia Institute of Technology · *s*
Funding provided by The Bell Companies Fellowship Fund

At IAS, John Etnyre will focus on invariants of knots and 3-manifolds using the "co-normal construction" and contact homology. He also will study transverse contact embeddings of contact 3-manifolds into contact 5-manifolds (which should be thought of as a higher-dimensional analogue of the study of transverse knots in contact 3-manifolds) and connections between Riemannian geometry and contact geometry.

Paul Feehan

Differential Geometry, Partial Differential Equations, Mathematical Physics · Rutgers, The State University of New Jersey
Infosys Member; additional funding provided by the Oswald Veblen Fund

Paul Feehan is interested in analytical aspects of Yang-Mills gauge field theory, applications of Yang-Mills theory to understanding the geometry and topology of three- and four-dimensional smooth manifolds, and mathematically rigorous approaches to quantum Yang-Mills theory.

SCHOOL OF MATHEMATICS

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

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Sergio Fenley

Low-Dimensional Topology, Foliations and Flows in Dimension 3 · Florida State University · *v /f, s*
AMIAS Member; additional funding provided by the Ellentuck Fund

Sergio Fenley is interested in foliations and Anosov/pseudo-Anosov flows in 3-manifolds. He wants to understand the relationship of these objects to the topology and geometry of the underlying manifold, especially when the manifold is hyperbolic. He also plans to analyze interactions with contact geometry/contact flows and statistical properties of dynamical systems.

Amanda L. Folsom

Number Theory · Amherst College · *vnf, s*
Funding provided by the National Science Foundation

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

Michael Forbes

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

Michael Forbes studies the intersection of randomness, algebra, and computation, with a specific focus on the explicit construction of pseudorandom objects in algebraic complexity theory.

Steven Frankel

Geometric Topology and Dynamics · Institute for Advanced Study
Schmidt Fellow; supported by Eric and Wendy Schmidt and the National Science Foundation

Steven Frankel's research concerns flows and other dynamical structures on 3-manifolds. In particular, he is interested in quasigeodesic flows, pseudo-Anosov flows, and taut foliations, whose dynamics are reflected "at infinity" in an action of the fundamental group on a universal circle.
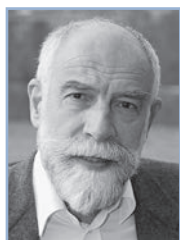
Jürg M. Fröhlich

Theoretical and Mathematical Physics · Eidgenössische Technische Hochschule Zürich · *s*
Funding provided by the Giorgio and Elena Petronio Fellowship Fund

Jürg Fröhlich researches a broad spectrum of topics in theoretical and mathematical physics. Some of his best work has been the result of collaboration with Professor Thomas Spencer. His recent work concerns various concrete problems in the foundations of quantum mechanics, effective quantum dynamics (a very promising field), and some special topics in cosmology.

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

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SCHOOL OF MATHEMATICS

David Futer

Low-Dimensional Topology, Hyperbolic Geometry, Geometric Group Theory · Temple University

Elinor Lunder Founders' Circle Member; additional funding provided by the Oswald Veblen Fund

David Futer is working on building connections between topological, geometric, and algebraic descriptions of the same object, predicting the hyperbolic geometry of a 3-manifold from combinatorial data, and studying related questions in coarse geometry and geometric group theory.

David Gabai

Low-Dimensional Topology, Hyperbolic Geometry · Princeton University

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.

Ziyang Gao

Number Theory · Institute for Advanced Study

Schmidt Fellow; supported by Eric and Wendy Schmidt and the National Science Foundation

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

Saul Glasman

Algebraic Topology · Institute for Advanced Study

Funding provided by the National Science Foundation

Saul Glasman studies equivariant and chromatic stable homotopy, higher category theory, and algebraic K-theory. He is particularly interested in exotic homotopy coherent structures arising in these contexts, as well as applications of homotopy theory to p-adic number theory.

Mark Goresky

Geometry, Automorphic Forms · Institute for Advanced Study

Funding provided by the Ellentuck Fund

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

SCHOOL OF MATHEMATICS

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

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Daniel R. Grayson

Univalent Foundations · University of Illinois at Urbana-Champaign · *v, f*
Funding provided by The Ambrose Monell Foundation

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

Robert Guralnick

Finite and Algebraic Group Theory, Representation Theory, Galois Theory · University of Southern California · *v, f*

Robert Guralnick studies the linear and permutation representation theory of finite and algebraic groups. He is currently working on obtaining bounds for low-degree cohomology with applications to presentations. He is also working on determining generic stabilizers in representations of semisimple algebraic groups. Another area of his research is properties of monodromy groups of coverings of curves.

Joel Hass

Geometric Topology and Applications · University of California, Davis
Shiing-Shen Chern Member; additional funding provided by The Ambrose Monell Foundation

Joel Hass works in low-dimensional geometry and topology. His current research projects include constructing random knots and 3-manifolds, minimal foliations, the computational complexity of topological algorithms, and measuring surface similarity. The last topic has applications to problems such as comparing brain cortices, proteins, and bone surfaces.
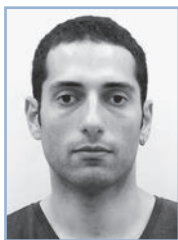
Pooya Hatami

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

Pooya Hatami is interested in theoretical computer science and combinatorics, in particular the study of randomness, computational pseudorandomness, and mathematical structure.

Jennifer Hom

Low-Dimensional Topology · Institute for Advanced Study
Funding provided by the National Science Foundation

Jennifer Hom's research is in low-dimensional topology, with a focus on using Heegaard Floer homology to answer questions about knots and 3-manifolds. She is specifically interested in understanding the structure of the knot concordance group.

Yong Hou

Geometric Group, Geometric Topology · Princeton University · *v/f, s*
Funding provided by The Ambrose Monell Foundation

Yong Hou works on geometric group, geometric topology, and geometric uniformization theory. Particular areas of interest include geometrization and structural complexity of hyperbolic groups by geometric dimension spectral, such as dimension spectral decompositions of Kleinian groups into thin-thick groups and its arithmetic properties, and thin group uniformization of Riemann surfaces via dimension spectral rigidity.

Robert Daniel Hough

Analytic Number Theory, Additive Combinatorics · Institute for Advanced Study
Funding provided by the National Science Foundation

Robert Hough's research focuses on introducing structural decompositions from combinatorics and other modern areas of analysis to study L-functions, multiplicative functions, and arithmetic statistics. He is also interested in quantitative equidistribution, especially related to groups.

June Huh

Algebraic Geometry, Combinatorics · Institute for Advanced Study and Princeton University · *vf*
Funding provided by the Clay Mathematics Institute and the National Science Foundation

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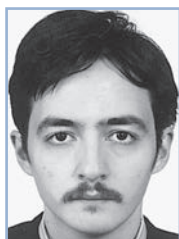
Mikhail Ivanov

Number Theory, Arithmetic Algebraic Geometry · Institute for Advanced Study · *v*
Funding provided by the Oswald Veblen Fund

The field of Mikhail Ivanov's research is algebraic number theory, so far mainly arithmetic algebraic geometry, local Langlands correspondence, formal modules, and explicit formulas. His recent research is concerned with studying ramifications in local fields and pairings on formal modules.

Juhi Jang

Analysis and PDEs · University of Southern California · *vnf*
Funding provided by the National Science Foundation

Juhi Jang is interested in the analysis of partial differential equations arising from fluid mechanics and kinetic theory, with a focus on physical phenomena driven by gravity and diffusion.

SCHOOL OF MATHEMATICS

Christian Johansson

Number Theory · Institute for Advanced Study
Funding provided by the National Science Foundation and the Minerva Research Foundation Membership Fund

Christian Johansson studies algebraic number theory, primarily in the Langlands program. Most of his work concerns overconvergent automorphic forms, but at IAS he also plans to study the p-adic Langlands program.

Junehyuk Jung

Analytic Number Theory, Spectral Geometry · Institute for Advanced Study · *f*
Funding provided by the National Science Foundation

Junehyuk Jung is studying asymptotic behavior of Maass-Hecke cusp forms in high-energy limit. Central objects of his research are nodal domains and nodal lines. At IAS, he aims to prove that the number of nodal domains tends to infinity with the eigenvalue, without assuming the Lindelöf hypothesis (Ghosh, Reznikov, and Sarnak, 2012).

Jeremy Kahn

Teichmüller Theory, Hyperbolic Geometry, Conformal Dynamics · The Graduate Center, The City University of New York

Jeremy Kahn works in complex analytic dynamical systems, Teichmüller theory, and hyperbolic geometry, and he is learning about semisimple Lie groups and quantum field theory. He is interested in finding (and counting) surface subgroups of lattices in semisimple Lie groups, and potential applications to number theory and geometric group theory.

Richard Kent

Geometry · University of Wisconsin—Madison · *vnf*
Funding provided by the National Science Foundation

Richard Kent's research currently focuses on the interaction of algebra, geometry, and topology in and around the subject of moduli of Riemann surfaces. Specifically, he is working on problems related to effective geometrization of 3-manifolds via Thurston's skinning map, subgroups of mapping class groups and the geometry of the corresponding surface group extensions, and the congruence subgroup problem for mapping class groups.

Nayoung Kim

Number Theory · Institute for Advanced Study · *v*

Nayoung Kim is primarily interested in the arithmetic of elliptic curves, especially twists of elliptic curves. She is currently working on the 3-Selmer rank in families of cubic twists of elliptic curves over arbitrary number fields in relation to Hilbert's Tenth Problem.

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

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Gillat Kol

Theory of Computation · Institute for Advanced Study
Funding provided by the National Science Foundation and the Minerva Research Foundation Membership Fund

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

Alex Kontorovich

Number Theory, Automorphic Forms · Rutgers, The State University of New Jersey · *s*

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

Cagatay Kutluhan

Geometry and Topology · University at Buffalo, The State University of New York · *vnf*
Funding provided by the National Science Foundation

Cagatay Kutluhan studies the geometry and topology of low-dimensional manifolds. At IAS, he plans to work on some applications of Floer homology to low-dimensional topology, particularly in the context of contact and symplectic geometry.

Catherine Lelay

Univalent Foundations · Institute for Advanced Study
Schmidt Fellow; supported by Eric and Wendy Schmidt and the National Science Foundation

Catherine Lelay is working on the formalization of univalent formalization of mathematics in Coq proof assistant.

Tye Lidman

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

Tye Lidman's research interests include studying knots, three- and four-manifolds using Floer theory, contact and symplectic topology, and orderability of groups. This year, he intends to focus on knot contact homology and on equivariant Floer homologies.

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

SCHOOL OF MATHEMATICS

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Baiying Liu

Automorphic Forms, Representations of p-adic Groups · Institute for Advanced Study
Funding provided by the S. S. Chern Foundation for Mathematics Research Fund, the Ky Fan and Yu-Fen Fan Membership Fund, and the National Science Foundation

Baiying Liu is interested in Fourier coefficients of automorphic forms, automorphic descent method, and problems related to Arthur classification of discrete spectrum of classical groups, as well as local Langlands reciprocity conjecture and Jacquet's conjecture on local/global converse problem for general linear groups.

Vladimir Markovic

Geometry · California Institute of Technology · *f*

Vladimir Markovic studies problems in geometric analysis and hyperbolic geometry, with particular interest in Riemann surfaces and 3-manifolds.

Dana Mendelson

Nonlinear Dispersive Equations · Institute for Advanced Study · *s*
Funding provided by the National Science Foundation

Dana Mendelson's research aims to study the long-time behavior of solutions to dispersive equations via a combination of probabilistic and deterministic techniques. In addition to general questions of existence and uniqueness, her current interests include symplectic non-squeezing for infinite-dimensional Hamiltonian systems.

Maryam Mirzakhani

Hyperbolic Geometry, Teichmüller Theory, Ergodic Theory · Stanford University · *f*
Minerva Research Foundation Member

Maryam Mirzakhani's research interests lie in the area of the moduli of Riemann surfaces and its interplay with other fields of mathematics. She is currently working on projects related to the ergodic theory of different flows on moduli spaces of curves. She is also interested in understanding the asymptotic behavior of surfaces of high genus, and the asymptotic properties of the moduli space of curves.

Amir Mohammadi

Lie Groups and Ergodic Theory · The University of Texas at Austin · *vnf*
Funding provided by the National Science Foundation

Amir Mohammadi studies the interplay between dynamics and other areas of mathematics, such as number theory and geometry.

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Anders Mörtberg
Univalent Foundations · Institute for Advanced Study
Funding provided by the National Science Foundation

Anders Mörtberg is interested in constructive algebra, logic, and the formalization of mathematics in computer proof assistants. During his stay at the Institute, he will work on the formalization of models of type theory in univalent foundations.

Joanna Nelson
Symplectic and Contact Topology · Institute for Advanced Study
Funding provided by the Charles Simonyi Endowment

Joanna Nelson is researching symplectic and contact topology. She is interested in the relationships between symplectic and contact homology theories. At the Institute, she plans to work on providing precise foundations and concrete examples of computations.
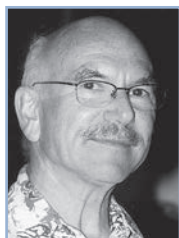
Walter D. Neumann
Geometry, Topology · Columbia University
Friends of the Institute for Advanced Study Member

Walter Neumann works mainly on low-dimensional topology and geometric group theory and the topology and geometry of isolated singularities of complex varieties.

Hoi Huu Nguyen
Combinatorics, Probability · The Ohio State University · *vnf*
Funding provided by the National Science Foundation

Hoi Huu Nguyen's current interests include inverse problems in arithmetic combinatorics, universality phenomenon in probability, and mathematical physics.

Ori Parzanchevski
Algebra, Combinatorics · Institute for Advanced Study · *v*

Ori Parzanchevski is interested in applications of groups and representation theory to combinatorics and geometry. Currently, he is studying spectral theory and combinatorics of simplicial complexes. In addition, he has been working on word maps in finite groups, isospectrality in discrete and Riemannian settings, and semistability in Euclidean lattices.

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Hector Pasten

Number Theory, Logic · Institute for Advanced Study
Schmidt Fellow; supported by Eric and Wendy Schmidt and the National Science Foundation

Hector Pasten is studying number theory and connections with Nevanlinna theory and definability problems in arithmetic.

Amit Patel

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

Amit Patel is interested in persistent homology for maps and its application to studying complicated geometries.

Doron Puder

Combinatorics, Combinatorial and Geometric Group Theory · Institute for Advanced Study
Funding provided by the National Science Foundation

Doron Puder is working on many aspects of free groups (word maps, representations, AutF), as well as the study of spectrum of graphs (expansion of random graphs, expansion in Cayley graphs, Ramanujan graphs). He is also interested, although less involved in, other areas of geometric group theory.

Jessica S. Purcell

Geometric Topology · Brigham Young University · *vnf, f*
Funding provided by the National Science Foundation

Jessica Purcell studies geometric structures on 3-manifolds, particularly hyperbolic structures. She is interested in the application of geometry to other questions and areas of study in 3-manifolds, such as knot theory. She aims to determine relationships between topological and combinatorial invariants and geometric invariants that come from hyperbolic structures.

Ran Raz

Computational Complexity · Weizmann Institute of Science · *vp*
Funding provided by the Simons Foundation and the National Science Foundation

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

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Alan Reid

Hyperbolic Manifolds, Discrete Groups, Low-Dimensional Topology · The University of Texas at Austin · *s*
Funding provided by the James D. Wolfensohn Fund

Alan Reid studies the geometry and topology of hyperbolic manifolds, mainly in dimension 3. Much of his research is motivated by conjectures about the topology of finite sheeted covers of hyperbolic 3-manifolds. His research on arithmetic hyperbolic manifolds connects with number theory and automorphic forms.

Noga Ron-Zewi

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

At the Institute, Noga Ron-Zewi plans to study complexity theoretic aspects of modern research directions in communication and coding. In particular, she plans to develop communication efficient error-correcting codes with sublinear time decoding procedures and communication and computational efficient error-correcting codes for multiparty communication.

Zeev Rudnick

Number Theory · Tel Aviv University
Friends of the Institute for Advanced Study Member

Zeev Rudnick is working on several topics related to number theory and its applications, particularly questions in quantum chaos, and on problems of analytic number theory in function fields.

Damaris Schindler

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

Damaris Schindler's research interests include the study of local global principles for rational points on varieties, density of rational points on Fano varieties, and Brauer-Manin obstructions to the Hasse principle and weak approximation in families of varieties. She often uses the Hardy-Littlewood circle method as a tool.

Tatyana Shcherbyna

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

Tatyana Shcherbyna works in random matrix theory and statistical mechanics. She is interested in local spectral properties of band matrices, and also in Wegner models, Heisenberg models, and other related topics.

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Egor Shelukhin

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

Egor Shelukhin studies metrics on the spaces of natural diffeomorphisms and submanifolds in contact and symplectic topology, using approaches involving Floer theory, geometric quantization, quasi-morphisms, and persistence modules.

Nicholas Sheridan

Symplectic Geometry · Princeton University · *v*

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

Alexei Skorobogatov

Arithmetic Geometry · Imperial College London · *f*
Funding provided by the Charles Simonyi Endowment

Alexei Skorobogatov is interested in geometric and cohomological approaches to rational points on algebraic varieties. The fundamental problem is to understand how the structure of solutions of Diophantine equations reflects the topology and geometry of the underlying variety. He is also interested in analytical number theory, algebraic groups, and the geometric invariant theory.

Florian Sprung

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

Florian Sprung likes to explore mysterious relationships between algebra and analysis. One such relationship is Iwasawa theory, which connects p-adic families of special values of L-functions to p-adic families of algebraic objects. In the case of elliptic curves, these techniques have applications for the conjecture of Birch and Swinnerton-Dyer.

Balazs Strenner

Low-Dimensional Topology, Mapping Class Groups, Pseudo-Anosov Homeomorphisms · Institute for Advanced Study
Funding provided by the National Science Foundation

Balazs Strenner's research so far has been in surface topology: mapping class groups, pseudo-Anosov homeomorphisms, and flat surfaces. At IAS, he would like to broaden his field of research to 3-manifold topology.

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Avishay Tal

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

Avishay Tal's interests include complexity theory, analysis of Boolean functions, circuit and formula lower bounds, decision tree complexity, pseudorandomness, and the relation between algorithms and complexity. The aim of his work is proving lower bounds for computational tasks in restricted models.

Abigail Thompson

Low-Dimensional Topology · University of California, Davis
Neil Chriss and Natasha Herron Chriss Founders' Circle Member

Abigail Thompson is interested in low-dimensional topology, particularly the study of three-dimensional manifolds and knot theory. She is currently working on questions regarding surgeries on knots in the 3-sphere, in addition to the stabilization conjecture for closed orientable 3-manifolds.

Roman Travkin

Algebraic Geometry, Representation Theory · Institute for Advanced Study
Funding provided by the National Science Foundation and the James D. Wolfensohn Fund

Roman Travkin studies quantizations in characteristic p, with applications in geometric Langlands duality for D-modules in characteristic p, and to other problems. He also wants to develop a theory of canonical quantization of symplectic schemes over Z/p^n-schemes. He is also working on some questions related to categorical Hecke algebras.

Lisa Traynor

Symplectic and Contact Topology · Bryn Mawr College · *s*

Recently, Lisa Traynor's research has been focused on studying Legendrian submanifolds of contact manifolds and Lagrangian submanifolds of symplectic manifolds. She is particularly interested in applying Morse-theoretic techniques to define invariants for these submanifolds and to study the existence of and obstructions to Lagrangian cobordisms between Legendrian submanifolds.

Cheng-Chiang Tsai

Representation Theory of p-adic Groups and Langlands Correspondence · Institute for Advanced Study · *s*
Funding provided by the National Science Foundation

Cheng-Chiang Tsai is studying representation theory of p-adic groups, in particular p-adic orbital integrals. He is especially interested in some related geometric objects: affine Springer fibers, Hessenberg varieties, perverse sheaves supported on nilpotent cones and their Fourier transforms, and so on. Nevertheless, he is interested in (local) Langlands correspondence.

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Karen Uhlenbeck

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

Karen Uhlenbeck works primarily in the area of 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.

Jan Vondrák

Algorithms, Optimization, Submodular Functions · IBM Almaden Research Center, San Jose, California · *f*

Jan Vondrák works on algorithms for optimization problems, especially those involving submodular functions. Of recent interest is a collection of submodular partitioning problems arising in computer vision, and a general methodology to prove the optimality of approximation factors for such problems. Vondrák is also working on algorithms for constructing objects whose existence is guaranteed by non-constructive proofs such as the Lovasz local lemma.

Zhiren Wang

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

Zhiren Wang studies smooth group actions on manifolds. In many cases, group actions are expected to be rigid in the sense that they preserve very few structures, especially when the acting group is of higher rank. Wang plans to explore this phenomenon in several different settings.
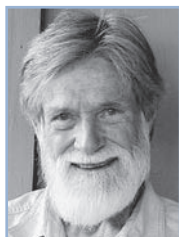
Robert F. Williams

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

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

Dale Winter

Hyperbolic Manifolds, Spectral Gap · Institute for Advanced Study
Funding provided by the National Science Foundation

Dale Winter is interested in spectral properties of hyperbolic manifolds, and particularly in connections between uniform spectral gap, expander graphs, and sieve. His work has focused on manifolds of infinite area, which he has tried to understand using dynamical tools.

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Alexander Murray Wright

Dynamics, Moduli Spaces · Institute for Advanced Study · *f*
Funding provided by the Clay Mathematics Institute and the National Science Foundation

Alexander Murray Wright primarily studies the dynamics of the GL(2,R) action on Hodge bundle over the moduli space of Riemann surfaces. Orbit closures of this action are varieties parameterizing Abelian differentials on Riemann surfaces whose Jacobians have special properties, such as large endomorphism algebras and torsion packets related to the Abelian differential.

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School of Natural Sciences

Administrative Officer: Michelle Sage

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

THE SCHOOL OF NATURAL SCIENCES, established in 1966, provides a unique atmosphere for research in broad areas of theoretical physics, astronomy, and systems biology.

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

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

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

Nima Arkani-Hamed
Professor · Particle Physics

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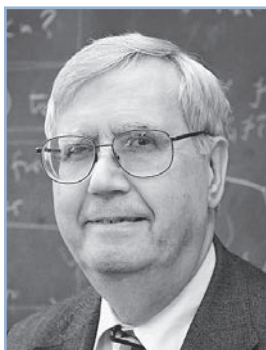
Peter Goddard
Professor · Mathematical Physics

Peter Goddard's research concerns quantum field theory and string theory. With his collaborators, he has made pioneering contributions to these areas, including string quantization and its 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.
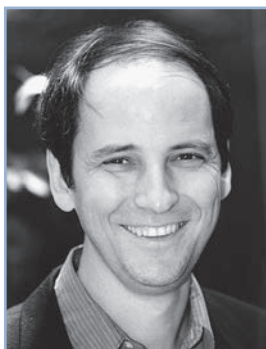
Stanislas Leibler
Professor · Biology

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

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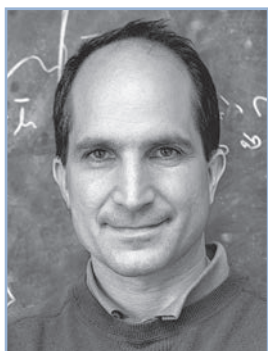
Juan Maldacena

Professor · Theoretical Physics

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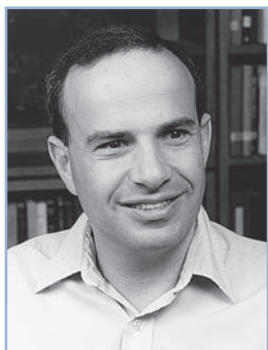
Nathan Seiberg

Professor · Mathematical Physics

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

Scott Tremaine

Richard Black Professor · Astrophysics

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

Edward Witten

Charles Simonyi Professor · Mathematical Physics

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

Matias Zaldarriaga

Professor · Astrophysics and Cosmology

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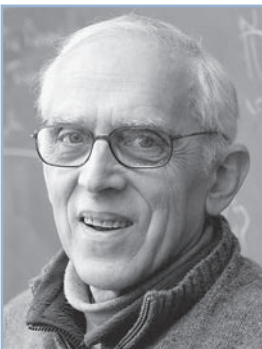
Stephen L. Adler

Professor Emeritus · Particle Physics

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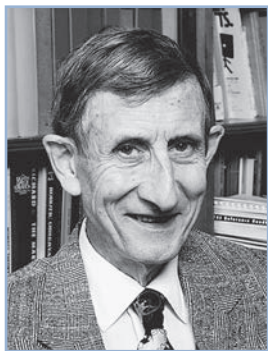
Freeman J. Dyson

Professor Emeritus · Mathematical Physics and Astrophysics

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

Peter Goldreich

Professor Emeritus · Astrophysics

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

Arnold J. Levine

Professor Emeritus · Biology

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

Victor Alexandrov

Biology · Institute for Advanced Study
Starr Foundation Member in Biology

Victor (Vitya) Alexandrov is interested in several topics in biophysics, especially evolutionary biology and big data problems. He plans to work on topological approaches to evolutionary networks.

Dionysios Anninos

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

Dionysios Anninos is studying how holographic notions are applied to cosmological spacetimes such as an expanding universe. He also studies the structure of black holes, as well as geometries containing multiple, fragmented horizons. Both subjects have curious connections to the physics of glasses, which he is currently exploring.

Valentin Assassi

Astrophysics · University of Cambridge
Infosys Member

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

Tobias Baldauf

Cosmology · Institute for Advanced Study
AMIAS Member; additional funding provided by the National Science Foundation

Tobias Baldauf aims to use the large-scale structure of the universe to provide answers to fundamental questions in physics. In particular, he is trying to understand how matter distribution evolves from linear initial conditions, where galaxies form, and how fundamental physics and initial conditions imprint themselves on the final galaxy clustering pattern.

Ben Bar-Or

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

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

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jvp Junior Visiting Professor · *ra* Research Associate

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Christopher John Beem

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

Christopher Beem studies quantum field theory and string theory, with an emphasis on the geometric structures that play a role in each. His present work includes the application of conformal bootstrap techniques to superconformal field theories.

Timothy David Brandt

Astrophysics · Institute for Advanced Study
NASA Exoplanet Science Institute Carl Sagan Fellowship

Recent technological advances enable us to directly image the most massive exoplanets around nearby young stars. Timothy Brandt is studying the hardware and image processing needed to see smaller and fainter planets, and ultimately, another Earth. He also plans to use statistics to constrain these exoplanets' properties and demographics.

Gustavo Burdman

Particle Physics · Universidade de São Paulo
Funding provided by The Ambrose Monell Foundation

Gustavo Burdman is researching extensions of the Standard Model of particle physics that can solve some of the theory's problems, including the origin of flavor, the hierarchy problem, and the nature of dark matter. He is currently studying quantum field theories that can be obtained from the deconstruction of extradimensional theories, in order to apply them to model-building in particle physics.

John Joseph M. Carrasco

Particle Physics · Stanford University

John Carrasco's interests are broad: from formal questions involving the UV finiteness of quantum field theories of gravity through sharp phenomenological questions involving next-generation cosmic microwave background and large-scale structure observations. He plans to pursue all of these at IAS, with some concentration on looking for the algebra governing the emergence of the color-kinematic duality of gauge theories.

Clay Cordova

Theoretical Physics · Harvard University · *m*
Schmidt Fellow; supported by Eric and Wendy Schmidt and the U.S. Department of Energy

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

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jvp Junior Visiting Professor · *ra* Research Associate

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Raffaele Tito D'Agnolo
Particle Physics · Institute for Advanced Study
Marvin L. Goldberger Member; additional funding provided by the U.S. Department of Energy

Raffaele D'Agnolo's research interests cover different aspects of particle phenomenology and experimental high-energy physics, including Higgs and flavor physics, supersymmetry, and collider searches at high jet multiplicities.

Liang Dai
Cosmology · Johns Hopkins University
NASA Einstein Fellowship Program

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

Neal Dalal
Astrophysics · University of Illinois · *jvp, f*
Funding provided by The Ambrose Monell Foundation

Neal Dalal's work is mainly in cosmology, with a focus on the formation of cosmic structure on both large scales and small scales. At IAS, he plans to investigate neutrino effects on large-scale structure, cosmic voids, and gravitational lensing.

Xi Dong
Theoretical Physics · Stanford University
Zurich Financial Services Member

Xi Dong's research interests range from formal questions in quantum gravity and quantum field theory to phenomenological aspects of particle physics and cosmology. He is currently exploring the connection between quantum entanglement and emergent spacetime, especially in the context of better understanding the holographic duality between string theory and quantum field theories.

Maxime Gabella
Theoretical Physics · Institute for Advanced Study

Maxime Gabella's research is about a correspondence that arises in string theory between supersymmetric gauge theories and the geometry and topology of 3-manifolds.

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jvp Junior Visiting Professor · *ra* Research Associate

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Abhijit Gadde

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

Abhijit Gadde is interested in understanding strongly coupled quantum field theories as well as conformal field theories. Most of his work has focused on exact computations in supersymmetric field theories. The interplay of physics and mathematics fascinates him.

Vera Gluscevic

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

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

David A. Huse

Theoretical Condensed Matter Physics, Statistical Physics · Princeton University
Addie and Harold Broitman Member in Biology

David Huse is studying the quantum many-body physics of ultracold atoms, both in and out of equilibrium, many-body localization at nonzero temperature, and other topics in phase transitions and quantum and classical statistical physics.

Shinta Kobayashi

Biology · Chugai Pharmaceutical Co., Ltd., Japan · *v*

Shinta Kobayashi works on cancer and stem cells. He plans to establish stem cell–derived cancer organoid models that have the potential to improve preclinical testing and validation of anti-tumor drugs.

Juna Kollmeier

Theoretical Astrophysics · Carnegie Observatories, Carnegie Institution of Science and Princeton University · *jvp*

Juna Kollmeier's research focus is on cosmology and cosmic structure formation, including black holes, stars, galaxies, and intergalactic gas. She will continue to work on these themes at the Institute, and she plans for her research to take new and unexpected directions in its uniquely stimulating intellectual environment.

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

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David Kosower

Quantum Field Theory, Particle Physics · Saclay Nuclear Research Centre
Funding provided by The Ambrose Monell Foundation

David Kosower's research is centered on scattering amplitudes in quantum field theories and in quantum chromodynamics in particular. He works on unitarity-based techniques for computing scattering amplitudes, and on applying them to computing background processes in experiments at the Large Hadron Collider.

Dmitry Krotov

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

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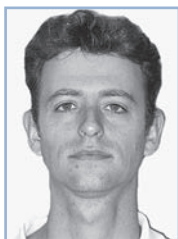
Doron Kushnir

Astrophysics · Institute for Advanced Study
John N. Bahcall Fellow

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

Sangmin Lee

Quantum Field Theory, String Theory · Seoul National University
IBM Einstein Fellow

Sangmin Lee is studying dualities in string theory, M-theory, and quantum field theory. His recent work concerns geometry of scattering amplitudes, holography of 3d-3d correspondence, and quantum field theories on branes probing toric Calabi–Yau cones.

Jennifer Lin

Particle Physics · The University of Chicago
Schmidt Fellow; supported by Eric and Wendy Schmidt and the U.S. Department of Energy

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

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

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Matthew Low

Particle Physics · The University of Chicago
The Peter Svennilson Membership

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

Marta Luksza

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

Marta Luksza is interested in questions at the interface of computer science, information theory, and biology. She is studying the evolution of viruses to understand the patterns of adaptation on the genetic and phenotypic levels.

Carlos Mafra

String Theory · University of Cambridge
Funding provided by the National Science Foundation and the Paul Dirac Fund

Carlos Mafra's research is focused on the computation of superstring scattering amplitudes at higher genus and higher multiplicity. In particular, he is using new superspace techniques based on the pure spinor formulation to try to uncover the underlying simplicity of string amplitudes and their field-theory counterparts.

Mehrdad Mirbabayi

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

Mehrdad Mirbabayi's research focuses on theoretical cosmology using the effective field theory approach.

Tejaswi Venumadhav Nerella

Cosmology, Astrophysics · California Institute of Technology
Schmidt Fellow; supported by Eric and Wendy Schmidt and the Fund for Memberships in Natural Sciences

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

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jvp Junior Visiting Professor · *ra* Research Associate

Hirosi Ooguri

Particle Physics · California Institute of Technology · *vp, f*

Hirosi Ooguri works on quantum field theory, quantum gravity, and string theory.

James Owen

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

James Owen is interested in star and planet formation, particularly the interaction between the parent star, the planet forming disc, and planets themselves. His research plans include understanding exoplanet structure and evolution along with the final stages of planet formation.

Luca Peliti

Biology · Sezione di Napoli, Istituto Nazionale di Fisica Nucleare
Martin A. and Helen Chooljian Member in Biology

Luca Peliti works on the physical processes of thermodynamic equilibrium based on information handling that relate to the basic workings of life—maintenance, growth, and reproduction. He plans to exploit the recent progress in nonequilibrium statistical mechanics to obtain a more fundamental understanding of their behavior from a physical point of view.

David Poland

Particle Physics · Yale University · *jvp*
Martin A. and Helen Chooljian Founders' Circle Member

David Poland's research is focused on quantum field theory and its connection to particle physics, condensed matter physics, and quantum gravity. He has pioneered the use of an approach called the conformal bootstrap for constraining and solving conformal field theories in general dimensions.

Pavel Putrov

Theoretical Physics · California Institute of Technology
Funding provided by the U.S. Department of Energy

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

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

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Roman Rafikov

Astrophysics · Princeton University · *jvp*
IBM Einstein Fellow; additional funding provided by The Ambrose Monell Foundation
Roman Rafikov works in the areas of planetary sciences, planet formation, N-body dynamics, fluid dynamics, accretion disks, and high-energy astrophysics.

Loganayagam Ramalingam

Particle Physics · Institute for Advanced Study
Funding provided by the U.S. Department of Energy
Loganayagam Ramalingam's research is in theoretical high-energy physics, including string theory, black hole physics, and quantum field theory, with a focus on real-time, finite temperature quantum field theory.

Mauricio Romo

String Theory · University of Tokyo
Funding provided by the U.S. Department of Energy
Mauricio Romo's current research lies at the interface between physics and mathematics. He has been focusing on two-dimensional field theories associated to the quantum geometry of compact Calabi-Yau manifolds and, recently, on three-dimensional theories related to invariants of 3-manifolds and knots.
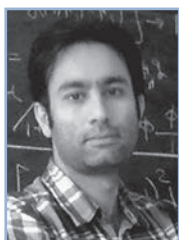
Yasser Roudi

Statistical Physics, Statistical Inference, Theoretical Biology · Norwegian University of Science and Technology
Starr Foundation Member in Biology
Yasser Roudi's research focuses on the principles of information processing and their relation to statistical mechanics and biological implementation. An organism's survival depends on the successful processing of environmental signals. Understanding the mechanisms that underly this and how they have been formed through evolution is the focus of Roudi's work at IAS.

Kris Sigurdson

Particle Astrophysics, Cosmology · University of British Columbia · *jvp*
Friends of the Institute for Advanced Study Member
Kris Sigurdson's research spans diverse topics in cosmology, particle physics, and astrophysics, including dark matter, baryogenesis, cosmological perturbations, cosmic microwave background, 21-cm fluctuations, and all-sky radio interferometry. At the Institute, he plans to focus on developing frameworks to include realistic models of dark matter physics into calculations of cosmological and astrophysical observables.

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jvp Junior Visiting Professor · *ra* Research Associate

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David Simmons-Duffin

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

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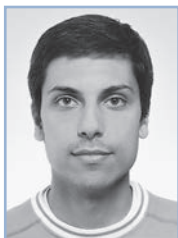
Marko Simonović

Cosmology · Institute for Advanced Study
Funding provided by the Raymond and Beverly Sackler Foundation Fund

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

Douglas Stanford

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

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

Rashid Sunyaev

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

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

Tsvi Tlusty

Biology · Institute for Advanced Study · *m*

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

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jvp Junior Visiting Professor · *ra* Research Associate

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Yuko Urakawa

Cosmology · Nagoya University · *v, f*

Yuko Urakawa works on cosmology and quantum field theory, particularly the physics of the early universe. She studies the infrared issues of primordial perturbations. She is also interested in exploring a possible way to holographically describe the de Sitter space.

Aron Wall

Particle Physics, Gravity · Institute for Advanced Study
Martin A. and Helen Chooljian Member; additional funding provided by the National Science Foundation

Aron Wall studies the thermodynamics of black holes and other horizons, mostly by proving theorems that connect gravity to information theory. He would like to find out what to postulate about the microstates of quantum gravity in order to get these thermodynamics principles to arise naturally.

Juven Chun-Fan Wang

Theoretical Physics · Massachusetts Institute of Technology · *s*
Schmidt Fellow; supported by Eric and Wendy Schmidt and the National Science Foundation

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

Xiao-Gang Wen

Theoretical Condensed Matter Physics · Perimeter Institute for Theoretical Physics · *s*

Xiao-Gang Wen is working on strongly correlated electronic systems, which include the theory of highly entangled quantum systems, the mathematical foundation of many-body entanglements, the theory of high-temperature superconductors, the theory of quantum Hall effect and non–Abelian statistics, and the origin and unification of elementary particles.

BingKan Xue

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

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

Masahito Yamazaki

Particle Physics · Institute for Advanced Study
Funding provided by the Adler Family Fund

Masahito Yamazaki is working on theoretical high-energy physics, particularly supersymmetric gauge theories and string theory. Recently, he has been studying exact results in supersymmetric gauge theories and their mathematical structures.

Ellis Ye Yuan

Theoretical Physics · Perimeter Institute for Theoretical Physics
Funding provided by the Corning Glass Works Foundation Fellowship Fund and the U.S. Department of Energy

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

Nadia Zakamska

Astrophysics · Johns Hopkins University · *jvp, s*
Deborah Lunder and Alan Ezekowitz Founders' Circle Member

Nadia Zakamska's research interests range from extrasolar planets to extragalactic astronomy. Most recently, she has been working on supermassive black holes, their formation and evolution, and their role in galaxy formation.

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

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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.

The School operates under the guiding principles of informality and collegiality and with a shared understanding that the social sciences are not to be narrowly defined. Each year, the School brings together scholars 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 2015–16 academic year is "Borders and Boundaries." The external limits of territories (borders) and the internal delimitations within societies (boundaries) have long been thought of in different terms: immigration, nationality, and citizenship in the first case; racial, ethnic, religious, caste, and class differentiation in the second. If globalization has hardened rather than abolished borders, it has also produced new realities and anxieties concerning social boundaries. The immigrants of yesterday have often become the minorities of today. Whether one considers the parallel rise of xenophobia and Islamophobia in Europe, the links between undocumented immigrants and Latino politics in North America, the conflicts between neighboring countries involving oppressed minorities in Asia, the repression of ethnic or religious groups in Africa, or the transnational circulation of terrorist networks, the reconfiguration of borders and boundaries in both war and peace raises anew classical problems of state formation, nation-building, and social contract. Under the direction of Professor Didier Fassin, scholars in the School will explore a range of related questions, including: How to analyze the continuities and discontinuities in the making of borders and boundaries? How to interpret contemporary insecurities concerning immigration and identities in relation with economic and cultural tensions? How to envisage the consolidation of racial, ethnic, and religious differences in a context of transnational circulation of goods and people? How are class and gender inequalities recomposed in the changing patterns of the nation-state? How do public policies, political parties, social movements, and non-governmental organizations address these issues? Scholars invited to work on this theme, or outside of it, come from higher education institutions of the six continents.

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, illuminating important dimensions of the AIDS epidemic, mortality disparities, and global health. More recently, he has 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 international relations. He is currently conducting an ethnography of the state, through a study of police, justice, and prison, and analyzes the possible contribution of the social sciences to a public debate regarding security, punishment, immigration, and inequality.

Joan Wallach Scott
Professor Emerita

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

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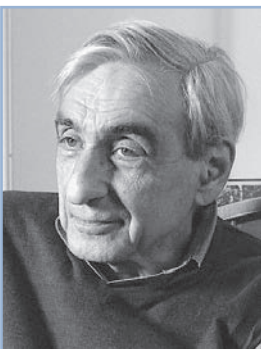
One of America's foremost political thinkers, Michael Walzer has written about a wide variety of topics in political theory and moral philosophy, including political obligation, just and unjust war, nationalism and ethnicity, economic justice, and the welfare state. In addition to writing frequently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

SCHOOL OF SOCIAL SCIENCE

Ari Adut

Sociology · The University of Texas at Austin

Ari Adut is working on a book that proposes a new explanation for the violent radicalization of the French Revolution. The project also has general implications for the social and political dynamics unleashed in times of state breakdown.

Angel Aedo

Anthropology · Pontificia Universidad Católica de Chile

Angel Aedo's project focuses on the experiences of immigrants on Chile's northern border, examining how care and control initiatives (deployed through government programs and non-governmental organizations) place a population of immigrants as both dangerous and endangered. These experiences at the edges, where social boundaries and territorial borders intertwine, can become pivotal instances of putting "forms of life" to the test.

Tugba Basaran

Political Science · University of Kent · *v*

Tugba Basaran's research centers on security, violence, and law, specifically in relation to fundamental rights, borders, and social boundaries. Her previous work focused on border controls and the legal geographies of liberal democracies. Her current project analyzes techniques of governing collective indifference to human suffering.

Linda Bosniak

Law, Legal Theory · Rutgers, The State University of New Jersey

Linda Bosniak is a legal theorist who has written about conceptions of justice in various citizenship and transnational migration settings. Her current work on irregular migrants in liberal states analyzes questions of whether, and how, irregular migrants can be said to have committed a wrong against the state, and in turn how an assessment of "wrongness" bears on claims made on behalf of immigrants' rights.

Serguey Braguinsky

Economics, Development, Industry Behavior · Carnegie Mellon University
Roger W. Ferguson, Jr., and Annette L. Nazareth Member

While we know that poor institutions are the main culprits behind economic failures, the most promising way of understanding how nations succeed appears to be studying the interaction between technological opportunity, human capital, market demand, and institutional rules governing rent appropriation. Serguey Braguinsky is using detailed "nanoeconomic" data from Meiji-era Japan to examine this issue.

David Ciepley

Political Theory and Intellectual History · University of Denver
Frederick Burkhardt Fellowship funded by the American Council of Learned Societies

David Ciepley's research challenges the reclassification of corporations over the past two centuries from "bodies politic" to private enterprises–a legal status that exempts them from any duty to, accountability to, or even publicity to the public, and that endows them with legal rights and protections that they ought not to have.

Brian Connolly

History · University of South Florida

Brian Connolly is researching kinship, religion, and law in the nine-teenth-century United States. Exploring six sites where kinship and religion intertwined in the context of the rise of international marriage law (representations of Hindu and Muslim kinship in India and North Africa, slave maroon communities, Mormonism, spiritualism, and ethnography), his study will offer genealogies of secularism, national sovereignty, and modernity.

Anne-Claire Defossez

Sociology · Institute for Advanced Study · *v*

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

Ilana Feldman

Anthropology and History · George Washington University
Friends of the Institute for Advanced Study Member

Ilana Feldman's project is based on extensive archival and ethnographic field research covering sixty-five years (from 1948 to the present) and five fields of displacement (Jordan, Lebanon, Syria, West Bank, and Gaza Strip). Exploring the complex world constituted by and through humanitarianism, her study aims to provide a comprehensive account of the Palestinian experience of living with humanitarian assistance across this full time and space.
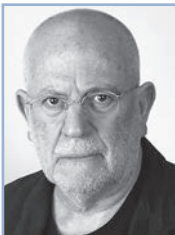
Chaim Gans

Political Theory · Tel Aviv University

Chaim Gans is studying the relationship between cosmopolitanism and nationalism implied by proprietary, hierarchical, and egalitarian types of nationalism. Under the egalitarian type, nationalism and cosmopolitanism are compatible, mutually dependent, and complementary. He plans to discuss the details of their dependence as political visions and defend a cosmopolitan account for the distribution of national/cultural rights.

SCHOOL OF SOCIAL SCIENCE

Alice Goffman

Sociology · University of Wisconsin–Madison

Alice Goffman's project is an ethnographic inquiry into the formation of human bonds and human identity. What are the situations that generate, sustain, and end our bonds to people and things? What are the experiences, large and small, that make us who we are? The ideas come out of field notes, but most of the examples in the text come from novels and non-fiction.

Carol C. Gould

Political Philosophy · The Graduate Center, The City University of New York

Carol Gould is addressing the motivation for taking seriously the human rights and basic needs of others across borders—e.g., those affected by extreme poverty or climate change—and for standing in solidarity with them. Drawing on theories of deliberative democracy, care ethics, and social movements, her project will investigate how empathy can make reasoning more effective and recognition more inclusive.

Abdoulaye Gueye

Race Studies · University of Ottawa

Abdoulaye Gueye is completing a study of racial boundaries in France, with a specific focus on blackness. This research examines the collective process by which social actors are assigned distinct racial groups, and more importantly come to understand when race is at play, and in turn convey this knowledge. It will thus unveil the behavioral and rhetorical mechanisms with which individuals teach and learn racial boundaries.

Tod G. Hamilton

Immigration, Health, and Race · Princeton University
Deutsche Bank Member

Between 1960 and 2013, the number of black immigrants in the United States increased from approximately 125,000 to approximately 3,793,000 individuals. Tod Hamilton is working on a project that investigates the magnitude of black immigrants' health advantage, how these advantages differ among immigrants by both country of origin and arrival cohort, and whether health selection is a primary driver of observed differences in health outcomes.

Enze Han

Political Science · University of London
Friends Founders' Circle Member

Enze Han is looking at the process of state building and nation formation in the multiethnic borderland region in upperland Southeast Asia. Utilizing an interactive theoretical framework, he plans to provide a detailed and comparative analysis of the nation and state building strategies of China, Myanmar, and Thailand, and how they influence each other during and after the Cold War periods.

Firoozeh Kashani-Sabet

History · University of Pennsylvania

Firoozeh Kashani-Sabet works on Middle Eastern history with a focus on Iran, the Ottoman Empire, and the Persian Gulf. Her research discusses the significance of land and border disputes in the process of identity and nation formation. She plans to complete a book that expands on her arguments about frontiers, migration, nature, and border communities in Middle Eastern modernity.

Nannerl O. Keohane

Political Theory · Princeton University · *v, f*

Nannerl Keohane is currently researching the theory and practice of leadership in democratic societies. At IAS, she plans to work on a book about democratic leadership, with particular attention to issues of inequality, institution building, and working together for the common good.

Monica Kim

History · New York University
AMIAS Member

Monica Kim is working on a trans-Pacific history of decolonization told through the experiences of two generations of people creating and navigating military interrogation rooms of the Korean War. Through this prism, her study tells the story of how this U.S. and United Nations "police action" generated a new paradigm for liberal warfare—the war of intervention.

Beth Lew-Williams

History · Princeton University · *v*

Beth Lew-Williams is a historian of race and migration in the United States who specializes in Asian American history. Her current project is a new history of Chinese Exclusion that maps the tangled relationships between local racial violence, federal immigration policy, and U.S. imperial ambitions in Asia.

Duncan McCargo

Politics · University of Leeds · *v, f*

Duncan McCargo is writing a study of politics and justice in Thailand, which draws upon his fieldwork spent attending political trials and embedded with the Bangkok police. His work also addresses broader questions about the recent revival of notions of treason and the shortcomings of the transitional justice paradigm.

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Maurizio Meloni

Sociology · University of Sheffield · *v*

Maurizio Meloni is a social theorist working on the historical, conceptual, and political implications of the life-sciences, in particular, postgenomics and epigenetics. At IAS, he plans to investigate the conceptual and political implications of the new wave of biosocial studies that look at the way in which social structures shape human biology and, in the case of epigenetics, even at possible transgenerational effects.

Francesca Merlan

Anthropology · Australian National University
Wolfensohn Family Member

Francesca Merlan is completing a book that focuses on the relational precipitation of indigenous–nonindigenous boundaries, and their changing character over time. This study is ethnographically informed by her long-term research in northern and central Australia, and comparatively informed with particular reference to other indigenous-settler states.

Basile Ndjio

Anthropology · University of Douala

Basile Ndjio is working on a project that analyzes the forging of sexual nationalism and citizenship in Cameroon. The research will focus on the construction of heterosexual subjects promoted as good citizens, and the alienation of homosexual persons construed as "alien" citizens and "uprooted" Africans.

Paul Nugent

Political Science, History · The University of Edinburgh

Paul Nugent's current research explores the way in which the state in Ghana and Uganda is being reconfigured at the margins. Starting from a comparison of state-making processes over the past hundred years, the project seeks to bring together an analysis of policy formulation covering border regions with a bottom-up appreciation of how official interventions are received, appropriated, ignored, and subverted.

Rhacel Salazar Parreñas

Sociology · University of Southern California
Deutsche Bank Member

Rhacel Parreñas is researching the conditions of servitude for migrant domestic workers in Singapore and the United Arab Emirates. In both countries, migrant domestic workers lack employer or labor market flexibility. Relying on in-depth interviews with migrant domestic workers and employers, this study explores servitude so as to interrogate and define the state of being unfree in the twenty-first century.

Sylvain Perdigon

Anthropology · American University of Beirut
Funding provided by the Florence Gould Foundation Fund

Sylvain Perdigon's research concerns moral selfhood, power, and kinship or "the mutuality of being" (M. Sahlins) in the Middle East. He plans to complete a book that explores how contradictory historical processes fostered by the politics of empire, nationhood, and sovereignty in the Eastern Mediterranean are refracted through everyday modes of obligation and affiliation in a Palestinian refugee community in Tyre, South Lebanon.

Kristin Surak

Political Sociology · University of London
Richard B. Fisher Member

Kristin Surak is examining temporary low-skilled migrant work programs to understand how actors manage the boundaries of the state, nation, and economy, and why the inclusion and exclusion of foreign workers assumes different forms. At IAS, she plans to undertake the first global mapping of guestwork programs in Southern Africa, Europe, North America, the Gulf, East Asia, and Southeast Asia.

Miriam Ticktin

Anthropology, Medicine, Theories of Feminism · The New School for Social Research

Miriam Ticktin is investigating practices of containment at the border, and how these are shaped by encounters between humans and non-humans, from wildlife to viruses. She is interested in how the mobility of nonhumans shapes the mobility of people. Her project focuses on walls, fences, and spaces of quarantine.

Jennifer A. Widner

Politics, International Affairs · Princeton University · *v*

Jennifer Widner is working on a book about making government work in under-served communities, as well as two projects on the public management aspects of the West African Ebola response and of forest preservation.

SCHOOL OF SOCIAL SCIENCE

Program in Interdisciplinary Studies

THE PROGRAM IN INTERDISCIPLINARY STUDIES explores different ways of viewing the world, spanning a range of disciplines from physics and astrophysics, geology, paleontology, and biology, to artificial intelligence, cognitive psychology, and philosophy. The most recent interdisciplinary focus is on questions related to origins of life and the nature of complexity. 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 interdisciplinary explorations in the areas of cognitive science and philosophy of science centered around questions involving the nature of knowledge. A third 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. 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.

Catherine Chung

Writing · Adelphi University · *v, s*

Catherine Chung is researching and writing a novel that will explore math and physics, as well as history, race, gender, and war, and how seemingly distant, unrelated stories, lives, and ideas can turn out to be inextricably linked to each other.

Henderson (Jim) Cleaves

Chemistry · Carnegie Institution of Washington · *v*

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

Douglas Duckworth

Philosophy · Temple University · *v*

Douglas Duckworth works on the relationship between ontology and epistemology in Buddhist philosophy. He is interested in the intersections of phenomenological and ontological approaches to meaning. His research involves inquiry into the nature of subjectivity and cognition and the ways each is constituted, enacted, and constructed.

Donato Giovannelli

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

Donato Giovannelli is interested in how life co-evolved with our planet. He is using model microorganisms from deep-sea hydrothermal vents in an attempt to reconstruct the emergence and evolution of metabolism and to better understand the interplay between the biosphere and the geosphere.

Reiner Grundmann

Sociology · University of Nottingham · *v, s*

Reiner Grundmann's current research interests are twofold. He wants to analyze the public discourse on climate change in various countries, in a comparative fashion. He is also interested in the relation between knowledge and decision making, focusing on the role of expertise in modern society.

PROGRAM IN INTERDISCIPLINARY STUDIES

Hyun Ok Park

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

Hyun Ok Park is exploring the practice of comparison and the grounds for comparability in the humanities and social science. Her current book project investigates the latest return of universal politics in and beyond South Korea, which departs from both modern emancipatory and postmodern identity politics.

Michael Th. Rassias

Mathematical Analysis, Analytic Number Theory · Universität Zürich · *v*

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.

Edwin L. Turner

Astrophysics · Princeton University · *v*

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

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.

KC Cole
Journalist; Professor, University of Southern California

KC Cole writes about math, physics, and social issues, often intertwined, for most major U.S. magazines and newspapers. She also organizes an art/science/politics/whatnot series called Categorically Not!—which she'll be bringing to IAS in April. The theme of the event, as well as her research, will be real and imagined boundaries, limits, and horizons within and between disciplines; the work represents a sequel of sorts to her most recent book, a biography/memoir of her mentor, the late Frank Oppenheimer.

Carmela Vircillo Franklin
Professor of Classics, Columbia University

Carmela Vircillo Franklin studies Latin, Greek, and Old English texts within the manuscript culture of the Middle Ages. While at IAS, she will be reconstructing the lost *Liber Pontificalis* [*Book of the Popes*] of the twelfth century for a critical edition to be published in the *Monumenta Germaniae Historica*.

Marc Henneaux
Theoretical Physicist; Professor, Université Libre de Bruxelles;
Director, International Solvay Institutes (Brussels)

Marc Henneaux's research interests cover gravity and quantum field theory. His current work deals with higher-spin gauge fields in three and higher spacetime dimensions, as well as the hidden infinite-dimensional symmetries of hyperbolic Kac-Moody type that have been conjectured to underlie various theories involving gravity (the most notable one being E(10) related to maximal supergravity).

Artist-in-Residence Program

THE ARTIST-IN-RESIDENCE PROGRAM was established in 1994 to create a musical presence within the Institute community and to have in residence a person whose work could be experienced and appreciated by scholars from all disciplines. Composer Sebastian Currier continues as Artist-in-Residence, curating the Edward T. Cone Concert series and hosting conversations with artists, while pursuing his creative and intellectual work as part of the Institute's community of scholars.

Sebastian Currier
Composer

Sebastian Currier is a composer of complex and imaginative works, which have been performed by such eminent artists and ensembles as Anne-Sophie Mutter, Berlin Philharmonic, Kronos Quartet, and the New York Philharmonic. A recipient of the prestigious Grawemeyer Award, Currier has received numerous honors including the Berlin Prize, the Rome Prize, a Guggenheim Fellowship, and an Academy Award from the American Academy of Arts and Letters, and he has held residencies at the MacDowell and Yaddo colonies. He received a D.M.A. from the Juilliard School, and from 1997–2007 he taught at Columbia University. In the 2015–16 season, the Boston Symphony will perform *Divisions*, a work they co-commissioned, first in Boston at Symphony Hall, and then in New York at Carnegie Hall. The Cincinnati Symphony will give the world premiere of *Flex*, a concerto for orchestra, in November.

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