We invite applications to participate in the 4th UBIAS

Intercontinental Academy (ICA): Intelligence and Artificial Intelligence

Marseille November 23-December 2 2020

Belo Horizonte November 2021

Call for Fellows Open February 3rd– May 15th 2020

Applications should be submitted to

ubias-ica4@univ-amu.fr

The ICA seeks to create a global network of future research leaders by constructing an arena in which the very best early/mid-career scholars will work together on paradigm-shifting cross-disciplinary research, mentored by some of the most eminent researchers from across the globe. A key aspect is deriving the full benefit of the intercontinental origins of the endeavor and diversity of thought and culture. This immersive and intense experience is expected to transform the scholar's own approach to research, enhance their awareness of the work, relevance and potential impact of other disciplines, and to inspire and facilitate new collaborations between distant disciplines; our aim is to make a real, yet volatile, intellectual cocktail that leads to meaningful outputs.

The structure The academia is based around two intensive workshops held on different continents which provide space for learning about the inward perspective of each "subject", performing a comparative analysis of the panorama and searching for correlations among these different views and perspectives. The scholars are guided during these workshops by an array of mentors who are themselves some of the most outstanding disciplinary and interdisciplinary researchers of our time. Within the programme, the scholars will have the space to help to define the precise workshop structure and the outputs from the project (example: a book is envisaged).

The theme **Intelligence and Artificial Intelligence** has been selected to provide a forum and framework for the intellectual exchange. The last decades have witnessed an impressive progress in cognitive science, neuroscience and artificial intelligence. Beside the decisive scientific advances that have been accomplished, among other major developments, in the analysis of brain activity and its behavioral counterparts or in the information processing sciences (machine learning, wearable sensors…), and the many open fascinating issues, several fundamental and broader questions of deep interdisciplinary nature have been arising lately. In first place, as AI and neuroscience/cognitive science seem to show significant complementarities, a first question is to inquire to which extent these complementarities should drive research in both areas and how to optimize synergies. More broadly speaking, the fantastic progress in these areas raises a series of major ethical and societal questions, and tremendous challenges for humanity as a whole that deserve wide and deep interdisciplinary discussions.

We seek outstanding early/mid-career researchers, normally within 15 years of achieving their PhD, who hold a research post in academia, industry, charity, arts or other organisations, which are equivalent to academic post of Lecturer or above, or an individual Principal Investigator Fellowship.

Most importantly the fellows should be willing and able to:
- explore ideas in the theme outside their direct line of research
- challenge world leaders of respective areas of knowledge
- play a role in forging the programme and its academic outcomes

Candidates are asked to provide:
- a summary of their interest in the topic, their expectations and a project presentation outlining how they will contribute to the Intercontinental Academia (max. 2 pages)
- a current CV
- a letter of endorsement from their institution/organisation with confirmation of financial support for travel. Accommodation and subsistence will be provided by the host IASs.

Applicants from LMIC countries who would like to participate but are unable to find funds for travel should contact (ubias-ica4@univ-amu.fr) for further advice.

Please note that presentations and discussions will be conducted in English and there will be no facilities for translation.

Successful applicants will contribute to the design and structure of the workshops and must confirm commitment to attending both workshops.

The workshop in Marseille is November 23-December 2 2020 and the workshop in Belo Horizonte will take place in November 2021.

Selection Procedure
Selection is based on a competitive application process. Up to fifteen applicants will be invited to participate in the program.

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Co-chairs

Raouf Boucekkine, Director, Institute for Advanced Study (IMéRA), Aix-Marseille University

Estevam de Las Casas, Director, Institute for Advanced Study (IEAT), Universidad Federal Minas Gerais

Eliezer Rabinovici , Leon H. and Ada G. Miller Professor, Racah Institute of Physics, Hebrew University of Jerusalem

Steering committee

- **F.-Xavier Alario,** CNRS Research director, Institute of Language, Communication and Brain, Aix-Marseille Unviersity

- **Thierry Artières**, Ecole Centrale de Marseille and Informatics and Systems Lab, Aix-Marseille University

- **Raouf Boucekkine**, Director, Institute for Advanced Study (IMéRA), Aix-Marseille University

- **Olivier Bouin**, Director, French network of institutes for advanced study (RFIEA)

- **Mario Campos**, Research Provost, Universidade Federal Minas Gerais

- **Thierry Chaminade**, CNRS research fellow, Institut de Neurosciences de la Timone, Aix-Marseille Université

- **Frederico Gadelha,** Professor at the Engineering School, Universidade Federal Minas Gerais

- **Thibault Gajdos,** CNRS Research Director, IMéRA program director, Laboratory of Cognitive Psychology, Aix-Marseille University

- **Sue Gilligan**, Deputy Director & Manager, Institute of Advanced Studies, the University of Birmingham

- **Marc Henneaux,** Professor, Collège de France

- **Estevam de Las Casas**, Director, Institute for Advanced Study (IEAT), Universidade Federal Minas Gerais

- **Ana Flavia Machado,** Director, Center for Institutional Relations, Universidade Federal Minas Gerais

- **Wagner Meira,** Head, Computer Science Department, Universidade Federal Minas Gerais

- **Laurent Perrinet,** CNRS Research fellow, Institute of Neurosciences at La Timone Hospital, Aix-Marseille University

- **Ary Plonski**, Coordinator, UBIAS

- **Eliezer Rabinovici**, Leon H. and Ada G. Miller Professor, Racah Institute of Physics, Hebrew University of Jerusalem

Mentors

Eminent researchers have already expressed interest in joining the project as mentors, these include:

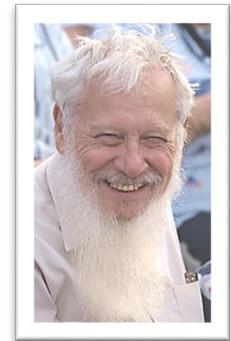### Anima Anandkumar

Microsoft and Sloan fellow, 2015 Google Research award. Anima Anandkumar is the Bren Professor of Computing at California Institute of Technology. She is a director of Machine Learning research at NVIDIA. Her research considers tensor-algebraic methods, deep learning and non-convex problems. Tensor algorithms are central to effectively processing multidimensional and multimodal data, and for achieving massive parallelism in large-scale AI applications.

Robert Aumann

2005 Nobel Memorial Prize in Economic Sciences for his work on conflict and cooperation through game-theory analysis, 2005 Jon Von Neumann Theory Prize, 1994 Israel Prize in economics. Robert Aumann is a professor at the Center for the Study of Rationality in the Hebrew University of Jerusalem, he is widely recognized for his fundamental contributions to game theory and related areas.
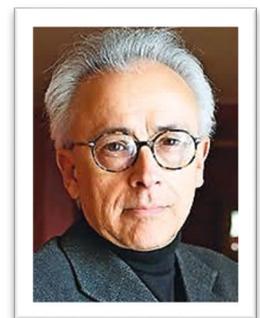
Jack Copeland

Jack Copeland is Professor of Philosophy at the University of Canterbury, Christchurch, New Zealand, and Director of the Turing Archive for the History of Computing, an extensive online archive on the computing pioneer Alan Turing. He is one of the people responsible for identifying the concept of hypercomputation and machines more capable than Turing machines. Copeland is also President of the US Society for Machines and Mentality and the founding editor of The Rutherford Journal, an open-access peer-reviewed online academic journal.

Antonio Damasio

1992 Pessoa Prize, 1995 Golden Brain Award, 2005 Prince of Asturias Prize, 2014 Grawemeyer award in Psychology. Antonio Damasio is David Dornsife Chair in Neuroscience, as well as Professor of Psychology, Philosophy, and Neurology, at the University of Southern California. He is widely known for his pioneering research in neuroscience and for his studies on feeling, emotions and consciousness. He holds Honorary Doctorates from the École Polytechnique de Lausanne and The Sorbonne. He is one of the most highly cited neuroscientists and one of the most eminent psychologists of the modern era.

Toshio Fukuda

2019 IEEE President-Elect, 1997 Dr.-Ing. Eugene Mittelmann Achievement Award, 2000 IEEE Third Millenium Medal, 2011 IEEE/RSJ IROS Harashima Award for Innovative Technology. Toshio Fukuda is professor in the Beijing Institute for Technology, and Emeritus professor at Nagoya University. He is a world leading researcher in robotics, with special interest in Intelligent robotic system, micro-nano robotics, bio-robotic system and neuromorphic intelligent control.

Timnit Gebru

Timnit Gebru is a computer scientist and the technical co-lead of the Ethical Artificial Intelligence Team at Google. She works on algorithmic bias and data mining. She is an advocate for diversity in technology and is the cofounder of *Black in AI*, a community of black researchers working in artificial intelligence. She is also widely recognized for her research on using machine learning and deep learning to predict demographic data using Google Street View.
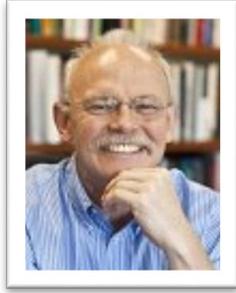
William Hopkins

William Hopkins is professor at MD Anderson · Michael E. Keeling Center for Comparative Medicine and Research, University of Texas. He is one of the world leading researchers in primates cognition. His behavioral research in chimpanzees has been focused on gestural and vocal communication, particularly the functional use of communicative signals in chimpanzees. In 2014, William. Hopkins was named Science Director at the Iowa Primate Learning Sanctuary (IPLS) in Des Moines in 2014.

Marc Mézard

1996 Ampère Prize, 2009 Humboldt Prize, 2016 Lars Onsager Prize. Marc Mézard is a physicist, director of the *Ecole Normale Supérieure*, Paris. His research is essentially rooted in statistical physics with broad applications in physics and beyond physics, including spin glass theory, neural networks or information theory.
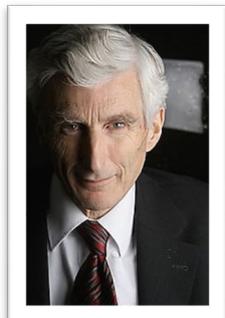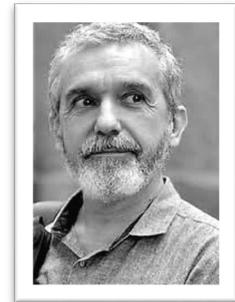
Jay McClelland

2005 Mind & Brain Prize, 2010 Rumelhart Prize, 2014 de Carvalho-Heineken Prize. Jay McClelland is the Lucie Stern Professor at Stanford University, where he co-directs the Center for Mind, Brain, Computation, and Technology. He is best known for his work on statistical learning and Parallel Distributed Processing, applying neural networks to explain cognitive phenomena such as spoken word recognition, language processing, and memory. Currently, Jay focuses on the development of mathematical cognitive abilities.

Zaven Paré

Zaven Paré is a new media artist, internationally known for his art work on electronic marionettes and robots. He is in particular actively involved in the Robots Actors Project of the laboratory of Professor Hiroshi Ishiguro (Osaka University). He designed his first electronic marionette in 1996 from a source of video retro-projection in Canada, followed in 1999 by the digital version at the Cotsen Center for Puppetry of Cal Arts (California Institute of the Arts).

Martin Rees

President of the Royal Society, 2005-2010, 1984 Heineman Prize, 2005 Crafoord Prize, 2011 Templeton Prize. Sir Martin Rees is a cosmologist and astrophysicist. He has been Astronomer Royal since 1995 and was Master of Trinity College, Cambridge from 2004 to 2012. Aside from his outstanding contributions to astrophysics and cosmology, Sir Martin Rees has written and spoken extensively about the problems and challenges of the 21st century, in particular within the Centre for the Study of Existential Risk he co-founded at the University of Cambridge.

Oron Shagrir

Oron Shagrir is Schulman Chair of Philosophy and Cognitive Science at the Hebrew University of Jerusalem. He has been working on the conceptual foundations of cognitive and brain sciences, the history and philosophy of computing and computability, and supervenience. He is one of the contributors to *The Turing Guide* (Oxford University Press, 2017).
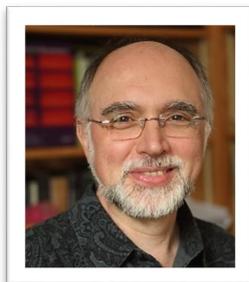
Shimon Ullman

2008 Rumelhart Prize, 2015 Israel Prize in Mathematics and Computer Science, 2019 Azriel Rosenfeld Lifetime Achievement Award in the field of computer vision. Shimon Ullman is Samy and Ruth Cohn professor of computer science at the Weizmann Institute of Science. Ullman's main research area is the study of vision processing by both humans and machines. Specifically, he focuses on object and facial recognition, and has made a number of fundamental insights in this field.

Xiao-Jing Wang

2017 Swartz Prize for Theoretical and Computational Neuroscience, 2018 Goldman-Rakic Prize for Outstanding Achievement in Cognitive Neuroscience. Xiao-Jing Wang is Distinguished Global Professor of Neural Science, director of the Swartz Center for Theoretical Neuroscience, at New York University. Xiao-Jing Wang is a world leading researcher in the theory and mathematical modeling of neural circuits dedicated to cognitive functions such as working memory and decision-making.

Robert Zatorre

2011 IPSEN foundation prize in neuronal plasticity, 2013 Knowles prize in hearing research. Robert Zatorre is professor in McGill University. He is a leading cognitive neuroscientist whose laboratory studies the neural substrate for auditory cognition, with special emphasis on two complex and characteristically human abilities: speech and music. In 2006 he became the founding co-director of the international laboratory for Brain, Music, and Sound research (BRAMS), a unique multi-university consortium with state-of-the art facilities dedicated to the cognitive neuroscience of music.

UBIAS University-Based Institutes for Advanced Study

The Institutes of Advanced Studies at Aix-Marseille University and Universidade Federal de Minas Gerais are part of a network of IASs across the world - UBIAS. One of the most successful initiatives developed between the members of this group is the Intercontinental Academia (ICA) where 'scientific exchange' between generations, disciplines, cultures and continents takes place around a topic or theme.

ICA 1 on the topic *Time* was held at University of Sao Paulo and Nagoya University (São Paulo April 2015, Nagoya 2016). ICA2 on the topic *Human Dignity* was held at the Hebrew University of Jerusalem and Bielefeld University (Jerusalem March 2016, Bielefeld August 2016). ICA 3 on *Laws: Rigidity and Dynamics* was held in Nanyang Technological University and University of Birmingham (Singapore 2018, Birmingham 2019).