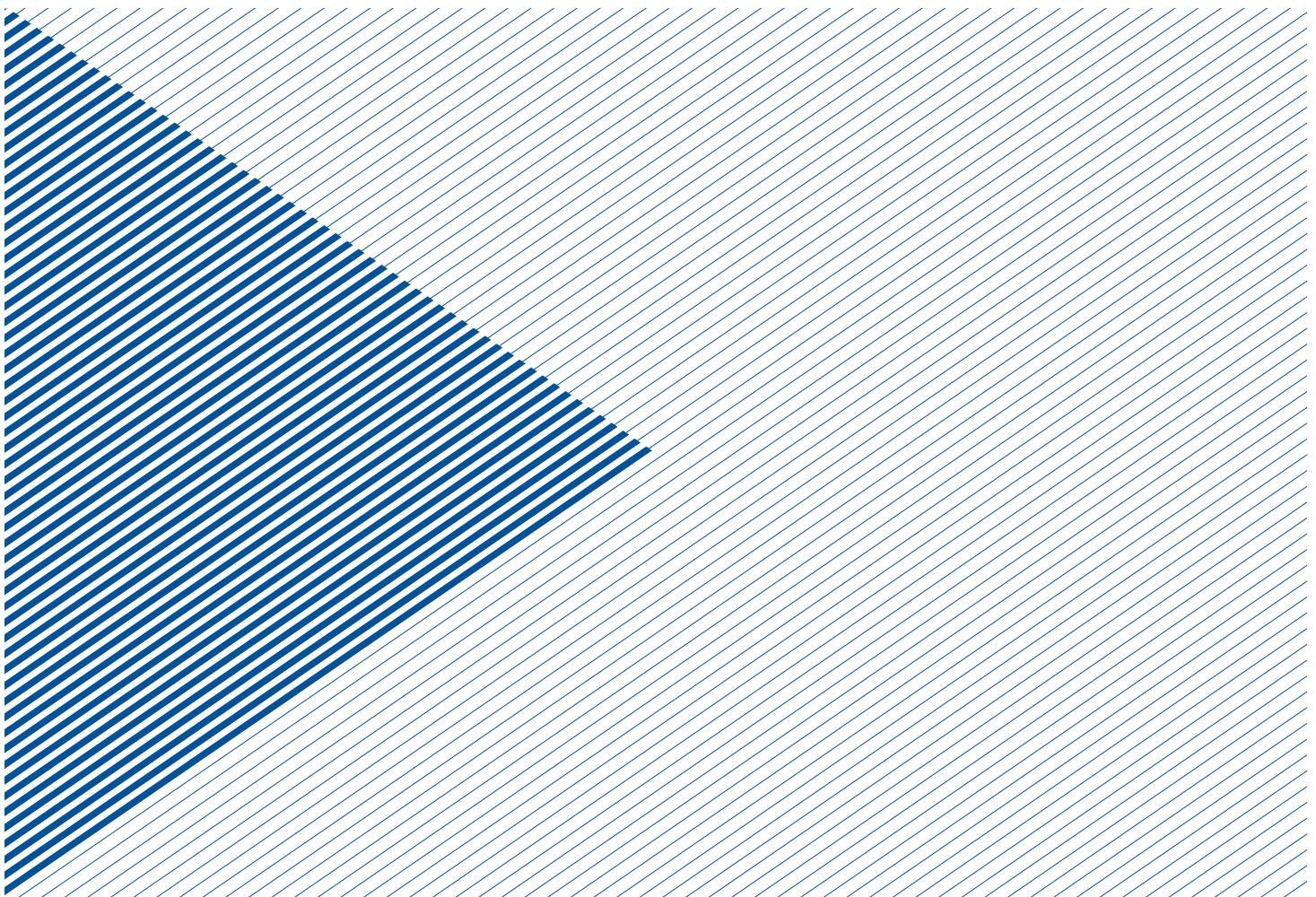




COMMITTED TO
IMPROVING THE STATE
OF THE WORLD

Young Scientists Class of 2013

List of Participants





Eva Alisic**

Larkins Fellow, Monash Injury Research Institute, Monash University, Australia

For contributing to the study of child mental health and resilience after traumatic events. Alisic's research has led to the development of tools and techniques that support children exposed to severe trauma.



June Andronick

Senior Researcher, National ICT Australia (NICTA), Australia

For research in the formal verification and certification of software systems, as well as research pertaining to the cyber resilience of smart devices. Andronick's research makes use of innovative mathematical frameworks to enhance the security and reliability of embedded chips used in medical devices and vehicles.



Patrick Kobina Arthur**

Lecturer, Department of Biochemistry, Cell and Molecular Biology, University of Ghana, Ghana

For research focusing on the isolation and characterization of novel bioactive compounds from organisms originating from tropical-equatorial hotspots. Arthur's research led to the discovery of new compounds from fungal sources, an important step towards eradicating multidrug-resistant infections.



Fuat Balci**

Assistant Professor, Psychology, Koç University, Turkey

For pioneering research into how humans and other animals perceive time. Balci's research contributes to our understanding of decision-making processes and the neurobiological basis of brain illnesses.

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Yusuf Baran**

Associate Professor, Department of Molecular Biology and Genetics, Izmir Institute of Technology, Turkey

For contributing to our understanding of the mechanisms that guide cellular multidrug resistance. Baran's work contributes to efforts to increase the efficacy of cancer chemotherapy.



Ghada Bassioni**

Associate Professor and Head, Department of Chemistry, Ain Shams University, Egypt

For interdisciplinary research in oilfield chemistry and green construction material development. Bassioni's research touches a wide range of topics such as the impact of cookware aluminium on human health and the development of novel cement admixtures.



Kelly Benoit-Bird

Associate Professor, College of Oceanic and Atmospheric Sciences, Oregon State University, USA

For enhancing our understanding of ocean ecosystems through her use of acoustics and novel tools. Benoit-Bird's research aims to understand how biological habitats influence the abundance and behaviour of key prey within ecosystems, such as krill and pollock, and how prey distribution affects the population dynamics of fur seals and marine birds in the Bering Sea.



Luke Bisby**

Arup Chair of Fire and Structures, College of Science and Engineering, The University of Edinburgh, United Kingdom

For research pertaining to how buildings respond to uncontrolled fires. Bisby's research alters how we approach building long-lasting structures by increasing their survival in the face of both natural and manmade disasters.

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Edward Boyden

Associate Professor, Media Lab and McGovern Institute, Massachusetts Institute of Technology (MIT), USA

For pioneering the field of optogenetics – a field that combines optics and genetics to control neuronal activity in living tissues – and for developing novel tools for analysing and engineering brain circuits as well as scalable neural recording techniques. Boyden's work reveals how neural circuits operate to generate behaviour and has applications in the treatment of neurological and psychiatric disorders



Duncan Cameron**

Royal Society University Research Fellow, Department of Animal and Plant Sciences, University of Sheffield, United Kingdom

For research pertaining to the functional and physiological ecology of host-parasitic plant interactions. Cameron's research translates fundamental notions of plant science into practical, agricultural technologies.



Chen Qixin**

Associate Professor, Department of Electrical Engineering, Tsinghua University, People's Republic of China

For developing software that increases power plant efficiency. Chen's software makes accurate predictions about future power demand and facilitates the coordination of utilities with power plants. His software is used in nearly 200 cities located throughout 10 Chinese provinces.



Jorgen D'Hondt**

Professor of Physics and Director, High Energy Physics Institute, Vrije Universiteit Brussel, Belgium

For his role as secretary of the international collaboration of 3,500 scientists responsible for the discovery of the Higgs Boson particle. This discovery is pivotal to the validation of the Standard Model of physics and contributes to our understanding of the Universe.

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Per Eklund**

Senior Lecturer, Department of Physics, Chemistry and Biology (IFM). Linköping University, Sweden

For innovations in the science of thin-film ceramics and thermo-electric materials. Eklund's research, which includes the discovery of several types of materials, has applications in energy conduction and energy harvesting.



Kevin Fu

Associate Professor, Department of Computer Science and Engineering, University of Massachusetts, USA

For improving the security of embedded computer systems by uncovering their security flaws. By aiming to make embedded computer systems smarter and more secure, Fu's research also reduces energy consumption and enhances systems' overall performance. Fu's work focuses on two classes of computing devices: implantable medical devices and radio-frequency identification devices.



Viviana Gradinaru**

Assistant Professor of Biology and Biological Engineering, California Institute of Technology (Caltech), USA

For contributing to the development and application of optogenetics, a technique that combines optics and genetics to control the neuronal activity in living tissue. Gradinaru's research has potential to enhance mental performance and reverse pathological behaviours like depression and addiction.



Nicole Grobert**

Professor of Nanomaterials, University of Oxford, United Kingdom

For developing new methods of creating, processing and characterizing a variety of nanomaterials, including nanoparticles, nanotubes and graphene. Grobert's research has applications in healthcare, energy and industry.

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Maarten van Herpen**

Director and Principal Scientist,
Philips Research, Royal Philips,
Netherlands

For innovations and entrepreneurial endeavours in diverse fields, from biosensing to LED technology and its translation to affordable products. Herpen's work has contributed to the creation of next-generation silicon chips, biosensors for DNA detection and LED lighting.



Vyacheslavs Kashcheyevs**

Associate Professor of Physics,
University of Latvia, Latvia

For pioneering research on single-electron quantum pumps, establishing the theoretical foundation for using quantum dynamic dots – semiconductors made of nanocrystals – to redefine the Ampere, the unit of electrical current. Kascheyevs' research has important implications for the future of information and communication technologies.



Kim Bumjoon**

Associate Professor, Korea Advanced Institute of Science and Technology (KAIST), Republic of Korea

For the enhancing our understanding of the interaction between nanomaterials and polymer interfaces. Kim's research led to the development of novel polymer-based hybrid materials and to their use in polymer electronics, such as solar cells and LEDs.



Heather A. Knutson

Assistant Professor, Division of Geological and Planetary Sciences, California Institute of Technology (Caltech), USA

For pioneering research on planet formation and migration, as well as for the characterization of exoplanetary atmospheres. Knutson's research contributes to our knowledge of the temperatures, compositions and atmospheric circulation patterns of planets orbiting nearby stars.

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Tonni Agustiono **Kurniawan****

Visiting Scholar, Institute of Advanced Studies, United Nations University, Japan

For contributing to the field of water technology and solid waste management, especially with regards to water purification. Kurniawan's innovations include treatment methods for addressing water contamination by liquids originating from landfills.



David **Lentink****

Assistant Professor, Mechanical Engineering, Stanford University, USA

For developing innovative micro flying robots that exploit the aerodynamic abilities of Earth's natural flyers – birds and insects. Lentink's robots are specially designed for flying in complex, cluttered environments under realistic atmospheric conditions.



Verena **Lepper**

Curator and Collection Keeper, Egyptian Museum and Papyrus Collection - National Museums Berlin, Germany

For contributions to our knowledge of ancient Egypt with regards to its history, art and language. Lepper's work focuses on early Egyptian art and texts, most notably on one of the masterpieces of world literature: the Westcar Papyrus.

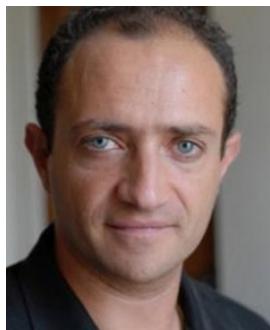


Guruprasad **Madhavan****

Senior Programme Officer, The National Academy of Sciences (NAS), USA

For innovative work in the fields of biomedical engineering and technology policy. Madhavan's work led to the development of a software decision-support tool called SMART Vaccines, which helps decision-makers prioritize their investments in new vaccine development.

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Sarkis K. Mazmanian

Assistant Professor, California Institute of Technology (Caltech), USA

For contributions to our understanding of the role of gut bacteria in the development of the human immune system. Mazmanian's work advances our knowledge of the evolutionary mechanisms of host-bacterial interactions within our bodies during health and disease.



Subhasish Mitra

Associate Professor, Department of Electrical Engineering and Department of Computer Science, Stanford University, USA

For contributing to developments of large-scale integrated circuits. Mitra's work includes designing robust computational systems and emerging nanotechnologies such as the X-Compact test compression technique, which contributed to the enhancement of cost-effective manufacturing and the testing of electronic systems.



Valeria Nicolosi**

Professor, Trinity College, Ireland

For characterizing and processing low-dimensional nanostructures such as graphene. Nicolosi's work contributes to the creation of next-generation semiconductors and the future of energy storage.



Konstantin Novoselov

Research Fellow, Mesoscopic Physics Research Group, University of Manchester, United Kingdom

For discovering the two-dimensional material graphene, the strongest material ever tested and the building block of all other graphite materials. Scientists are now exploring Novoselov's 2004 discovery for its potential applications in medicine and across diverse industry sectors – notably in the creation of solar cells, transistors and thin yet extremely durable touch screens.

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Shwetak Patel

Assistant Professor, Computer Science and Engineering and Electrical Engineering, University of Washington, USA

For the development of novel sensing solutions and ubiquitous computing, and using these smart networks to advance our understanding of human networks. Patel's research has applications in energy and product demand monitoring, home safety and elder care.



Laura Pete^{**}

Ecosystem Science Adviser, Climate Program Office, National Oceanic and Atmospheric Administration (NOAA), USA

For innovative research on climate change and ocean degradation, focusing on the impact of environmental stress on marine ecosystems. Petes' work advances our understanding of such topics as how thermal stress affects rocky intertidal mussels, how upstream drought impacts downstream oyster health and how a disease affecting sea fan coral reduces their reproduction and survival.



Wibool Piyawattanametha D^{**}

Group Leader, Light Microscopy Team, National Electronics and Computer Technology Center, Thailand

For innovating cancer screening techniques based on novel optical imaging devices and cancer biomarkers. Among Piyawattanametha's many achievements is the demonstration of the first clinical use of a novel handheld microscope in live human skin, with the ultimate goal of monitoring cancer progression and drug delivery.



Hele Savin^{**}

Assistant Professor, Micro and Nanosciences Department, Aalto University, Finland

For nanotechnology-based innovations in solar energy. Savin's research demonstrated that there is no need for trade-offs between solar absorbency and energy output, leading to the manufacture of cheaper, more effective solar cells.

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Beth Shapiro

Assistant Professor, Department of Ecology & Evolutionary Biology, University of California, Santa Cruz, USA

For research on the effects of environmental change on population size and biodiversity, using ancient DNA and epidemiological records. Shapiro's research advances our understanding of the molecular evolutionary processes that occur within populations and between species.



Shy Shoham**

Associate Professor, Biomedical Engineering, The Technion - Israel Institute of Technology, Israel

For advances in neural engineering and computational neuroscience. Shoham's research led to the development of technologies that allow medical professionals and researchers to directly interface with patterns of activity in neural systems.



Victor Tong Joo Chuan

Research Manager, SAP Research, Singapore

For contributing to the development of computer models of biological systems for vaccine development. Chuan's work includes using computer models to map biological systems including 3D models of the interactions between molecules, which can lead to development of better personalized vaccines.



Lucianne Walkowicz

Henry Norris Russell Fellow, Department of Astrophysical Sciences, Princeton University, USA

For her work in search of new planetary systems, as well as for her efforts in conserving our dark night skies, thus enabling astronomy and space research to continue. Walkowicz's work focuses on the magnetic activity of stars and its effect on planetary habitability.

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**Jun
Wang**

Professor of Genomics and Bioinformatics, Beijing Genomics Institute (BGI), People's Republic of China

For establishing the Beijing Genomics Institute, which aims to accelerate the development of genomic sequencing and the development of bioinformatics applications. Wang has contributed to the genomic sequencing of silkworms, pigs and the viral disease SARS.



**Wilfried
Weber****

Professor of Synthetic Biology, Albert-Ludwigs-Universität Freiburg, Germany

For developing smart polymer systems and genetic switches that enable cell programming, using material science and synthetic biology techniques. Weber's research contributes to the development of new drugs aimed at tackling antibiotic resistance.



**Wilfred G.
van der Wiel****

Chair, NanoElectronics Group, University of Twente, Netherlands

For contributions to the field of electron transport in semiconductor nanostructures and for applying such structures to quantum computation and hybrid electronics – materials that combine both molecular and crystalline materials. Wiel's work explores uncharted territory in the field of physics and advances our understanding of fundamental issues in science.



**Gijs
Wuite****

Professor, Faculty of Sciences, VU University Amsterdam, Netherlands

For research in DNA-protein interactions and biomechanical interactions of viral cells and protein shells, called capsids. Wuite's innovations, which include the development of new microscopy methods, apply methods of physics and single-molecule manipulation tools to study biological phenomena.

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