

PLuS ALLIANCE

PHOENIX | LONDON | SYDNEY

PLuS Alliance Prize 2017



**GLOBAL SOLUTIONS FOR
A SUSTAINABLE FUTURE**

The PLoS Alliance

The major challenges facing the world are global in nature. Solutions are beyond the capacity of any single institution, public or private. The PLoS Alliance combines the strengths of three leading universities with international standing – Arizona State University, King’s College London and UNSW Sydney – to deliver research-led solutions to global challenges and expand access to world-class learning.

The PLoS Alliance aims to:

- **Build partnerships to foster global innovation and serve the world**
- **Launch education programs nuanced to the needs of global learners**
- **Deliver solutions to global challenges through collaborative research.**

PLoS Alliance Global Prizes

The PLoS Alliance Presidents acknowledge the standing and excellence of two extraordinary global leaders whose work and careers have made significant impact in the four key areas of focus for the PLoS Alliance: sustainability, global health, social justice, and technology and innovation.

The Global Prizes recognise outstanding contribution in the areas of leadership and innovation.

In 2017, two global ground-breaking thought-leaders are acknowledged in the inaugural PLoS Alliance Global Prizes.

PLuS Alliance Prize for Global Leadership



Mr N R Narayana Murthy

Mr Narayana Murthy has been the key entrepreneurial architect of a once-in-a-generation industrial stewardship that led to a wave of change, reform and innovation in India's IT sector. He is a noted philanthropist who founded the Infosys Science Foundation that has worked tirelessly for a decade to highlight the importance of science and research in advancing humanity and to provide support to the scientists whose work is the foundation of this progress.

Murthy studied at the University of Mysore and Institute of Technology Kanpur before co-founding Infosys, a multinational corporation providing business consulting, technology, engineering and outsourcing services, in 1981. He served as its CEO of Infosys for over two decades and continues as its Chairman Emeritus. Murthy has served on many boards including HSBC, DBS Bank, Unilever, ICICI and NDTV and serves as a member of the advisory boards and councils including Cornell University, INSEAD, ESSEC, Ford Foundation, the UN Foundation, the Indo-British Partnership, a trustee of the Infosys Prize, a trustee of the Institute for Advanced Study at Princeton, and as a trustee of the Rhodes Trust. He is Chairman of the Governing board of Public Health Foundation of India and serves on the Asia Pacific Advisory Board of British Telecommunications. In 2005 he cochaired the World Economic Forum in Davos. Murthy has been listed among the 12 greatest entrepreneurs of our time by Fortune magazine. He has been described as the "Father of Indian IT sector" by Time magazine due to his contribution to outsourcing in India. Murthy has also been honoured with the Padma Vibhushan and Padma Shri awards.

The PLuS Alliance Presidents commend Mr Murthy's unremitting commitment to leadership in information technology innovation, social justice and philanthropy and have great pleasure in conferring the PLuS Alliance Prize for Global Leadership 2017.

PLuS Alliance Prize for Global Innovation



Associate Professor Francisco Juan Martínez Mojica

Professor Francisco Mojica's remarkable discovery of the acquired immunity system of prokaryotes (bacteria and archaea) known as CRISPR is one of the greatest recent advances in biology. His fundamental work on CRISPR for more than two decades, makes him the pioneer of this field. The study of the native CRISPR systems recently led to the development of outstanding laboratory tools that have greatly facilitated research in biology and medicine.

Professor Mojica's work in examining CRISPR has continued for over two decades and has resulted in further groundbreaking, globally-significant developments in microbiology and translational benefits to global health with gene editing allowing for CRISPR-Cas microbial immune system to destroy invading viruses. Mojica received his PhD in Biotechnology from the University of Alicante. He later completed two postdoctoral fellowships in laboratories at the University of Utah, Salt Lake City, and Oxford University in Great Britain. In 1997, he became professor of microbiology at the University of Alicante, founding the research group in molecular microbiology to resume the study on CRISPR he had initiated during his PhD thesis work. In the last few years, his investigation has focused on the CRISPR immunisation process, to understand how bacteria acquire foreign genetic material that make them resistant to infecting agents.

He has received many honours including the Lilly Foundation Award for Preclinical Biomedical Research, the Rey Jaime Prize for Basic Research, and the BBVA Foundation Frontiers of Knowledge Award and was winner of the Albany Medical Center Prize, 2017.

The PLuS Alliance Presidents commend Professor Mojica's pioneering and transformational work and his unceasing commitment to scientific discovery, advancement and innovation and have great pleasure in conferring the PLuS Alliance Prize for Global Innovation 2017.

The Awards

The winners of the PLoS Alliance Prize were announced at a special award ceremony sponsored by the PLoS Alliance at the *Times Higher Education* World Academic Summit in London on Sunday 3 September, 2017.

Professor Sir Malcolm Grant, the Chair of the PLoS Alliance Advisory Board, presented the winners with a trophy commissioned from UNSW Sydney Art and Design Lecturer Kate Dunn. Dunn collaborated with two of her Faculty's Masters students, Bronwen Williams and Karam Hussein, to design and produce a PLoS Alliance Prize trophy that symbolises the strengths and synchronous growth of the PLoS Alliance.

The Trophy — Triax

Triax: having or relating to three axes, a term used in design for combining three elements

The three designers selected three materials that represent the prestige and innovation embodied in the three universities:

- Concrete representing the wealth of history and innovation of King's College London
- American Walnut representing the growth of tree branches linking America's industry and ingenuity with England and Australia
- Aluminium representing the resources and agility of Australia.

An important symbol incorporated into Triax is the triangular forms at its pinnacle. The three points of the triangles represent the relationship between Arizona State University, King's College London and UNSW Sydney.

WINNER 2017

PLoS Alliance Prize for Education Innovation

SolarSPELL Solar Powered
Educational Learning Library for
remote, unconnected regions



Laura Hosman

SolarSPELL is a waterproof, ruggedized solar digital library designed for off-grid, unconnected locales. SolarSPELL offers a WiFi hotspot so that WiFi-enabled devices can connect and explore educational content on an easy-to-navigate website. SolarSPELL is an innovative, multi-disciplinary, student-centric project engaging on a global scale, intending to transform educational opportunities available in the most resource-constrained conditions. There are over 160 SolarSPELL units in the field, in schools and health care centres, across four Pacific Island nations: Samoa, Tonga, Vanuatu, and Micronesia.

SHORTLIST 2017

PLuS Alliance Prize for Education Innovation

PlayMed: Bridging the Gap between Student and Doctor with Serious Games

Keith Ooi

PlayMed is an online role-playing game that educates medical students using experience-based learning in a virtual hospital. It is an immersive approach to medical education that challenges the management and decision-making skills expected of a junior doctor. The prototype simulates several paediatric cases of acute asthma and provides a modality through which 'bedside' assessment and feedback can be delivered. PlayMed includes back-end data and tracking which allows for insights into student decision-making and learning.

ASPIRE: Changing lives by degrees

Ann Jardine

UNSW ASPIRE is a social justice program that addresses educational disadvantage in Australian society. ASPIRE was initiated as a strategy to address the inequity of access existing in Australian universities. It is an innovative and distinctive program, which reaches over 7,000 school students in Sydney and rural New South Wales, working in 56 schools from Kindergarten to Year 12 and working with students in their schools, on campus, and within their communities.

Arludo: empowering teachers and inspiring students with mobile technology

Michael Kasumovic

Arludo creates mobile apps to empower teachers and reduce the education gap. Arludo creates interactive and engaging STEM (science, technology, engineering and maths) games that make learning interesting, improving scientific thinking for students of all genders, ages and socioeconomic levels. Teachers can view decisions students make while playing, allowing for real understanding of learning processes. Arludo's objective is to become a global leader in applying creative technology to improve learning experiences, student engagement, and teacher productivity.

Extreme Psychiatry

Extreme Psychiatry

Extreme Psychiatry is a novel psychiatric teaching innovation, whose model has been refined annually over 12 years, in response to iterative learner and educator feedback. It is an eight-week extracurricular course for Phase 3 King's College London MBBS medical students, delivered three times per year by an entirely voluntary team of doctors, students, amateur and professional actors. Extreme Psychiatry is a popular yet sustainable model, which is always oversubscribed, despite taking place outside university teaching hours.

The PLS Alliance Prize

The PLS Alliance Prize recognises outstanding innovation contributions by individuals or groups in addressing the greatest global challenges facing society today

The PLS Alliance Prize was established in 2017 with a total prize of US\$50,000 and is awarded annually in two categories: Research Innovation and Education Innovation.

The PLS Alliance Prize for Research Innovation and the PLS Alliance Prize for Education Innovation are awarded to groundbreaking research that either addresses a need or solves a current problem in one or more of the areas of global health, sustainability, social justice, or technology and innovation, in the previous five years.

This Prize is designed to highlight innovative research that:

1. addresses a globally-significant issue
2. makes a direct and positive impact
3. helps – or has the potential to help – communities globally.

WINNER 2017

PLS Alliance Prize for Research Innovation

The new science of
green manufacturing



Veena Sahajwalla

Laureate Professor Sahajwalla is revolutionising recycling science, enabling global industries to safely utilise toxic and complex wastes as low-cost alternatives to virgin raw materials and fossil fuels. Professor Sahajwalla and her team are developing new processes that neutralise toxins while delivering savings in energy and resources, and reducing the environmental impact of manufacturing. The team is reimagining the global supply chain by demonstrating the viability of ‘mining’ overburdened landfills for resources.

SHORTLIST 2017

PLuS Alliance Prize for Research Innovation

Non-injectable naloxone to prevent heroin/opioid overdose deaths

John Strang

Research Professor Sir John Strang and his colleagues have made outstanding contributions to the fields of innovation and global health through the development of an opioid antidote.

In 1996, Professor Strang proposed that naloxone be made available directly to opioid users, 106,000 of whom die annually. The team has significantly advanced the development of non-injectable formulations of concentrated naloxone nasal spray and an oral naloxone tablet.

Pioneers of Silicon Quantum Computing

Andrea Morello & Andrew Dzurak

Large-scale quantum computation is described as the space race of the 21st century with the potential to address global challenges including climate change and global health by enabling the design of new catalysts and medicines at a molecular level. Morello and Dzurak were the first in the world to demonstrate the encoding and manipulation of quantum information in silicon, work that helps transform fundamental quantum science into a technically and commercially viable computing revolution.

Hot-wiring microbial communities for enhanced biogas production

Mike Manefield

Manefield developed and demonstrated a technology to enhance biogas production by re-wiring electron transfer processes in naturally occurring communities of microorganisms. His discovery has been demonstrated in the field to enhance gas yields from coal seams by an order of magnitude. This will transform the gas production industry not only using fossil fuels but also using renewable feedstocks in domestic and municipal anaerobic bioreactors mitigating dependence internationally on fuel imports.

Early warning of hypertension and shock in pregnant women with the novel CRADLE device

Andrew Shennan

The CRADLE Vital Signs Alert (VSA) is an affordable, portable and low power usage device that measures blood pressure and pulse, allowing detection of hypertension and shock. CRADLE has demonstrated that its VSA is an early predictor of pregnancy complications and poor outcome in women who have haemorrhage and sepsis, together with detecting pre-eclampsia.

The CRADLE VSA allows early triage. Approximately 6,700 devices have been distributed and adopted in 15 low-income countries.

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