

Global Agenda

Convening Innovators from the Science and Technology Communities

Annual Meeting of the New Champions 2014

Tianjin, People's Republic of China 10-12 September





W. Lee Howell
Managing Director
Member of the Managing Board
World Economic Forum

Discoveries in science and technology are arguably the greatest agent of change in the modern world. While never without risk, these technological innovations can lead to solutions for pressing global challenges such as providing safe drinking water and preventing antimicrobial resistance. But lack of investment, outmoded regulations and public misperceptions prevent many promising technologies from achieving their potential.

In this regard, we have convened leaders from across the science and technology communities for the Forum's Annual Meeting of the New Champions – the foremost global gathering on innovation, entrepreneurship and technology. More than 1,600 leaders from business, government and research from over 90 countries will participate in 100-plus interactive sessions to:

- Contribute breakthrough scientific ideas and innovations transforming economies and societies worldwide
- Catalyse strategic and operational agility within organizations with respect to technological disruption
- Connect with the next generation of research pioneers and business innovators reshaping global, industry and regional agendas

By convening leaders from science and technology under the auspices of the Forum, we aim to:

- Raise awareness of the promise of scientific research and highlight the increasing importance of R&D efforts
- Inform government and industry leaders about what must be done to overcome regulatory and institutional roadblocks to innovation
- Identify and advocate new models of collaboration and partnership that will enable new technologies to address our most pressing challenges

We hope this document will help you contribute to these efforts by introducing to you the experts and innovators assembled in Tianjin and their fields of research.



Communities Focusing on Science and Technology Issues

In addition to the distinguished faculty that shapes the Science and Technology agenda at the Annual Meeting of the New Champions, much of the interaction is tied to Forum communities, which converge around a common interest in addressing global challenges. Some of these communities at the Annual Meeting of the New Champions are listed below.

The Network of Global Agenda Councils comprises over 1,500 leaders from academia, business, government, international organizations and society. Grouped in over 80 Councils, they commit their extensive expertise and passion to jointly shape the global, regional and industry agendas. The Councils address the most pressing issues of our time and aim to provide new thinking and solutions.

Science and Technology Councils include:

- Artificial Intelligence and Robotics
- Brain Research
- Data-Driven Development
- Economics of Innovation
- Nanotechnology
- Space

<http://www.weforum.org/community/global-agenda-councils>

The Forum's **Young Scientists** community brings together the most forward-thinking and advanced young scientific minds in the world. They are selected from all regions and a wide range of disciplines, and have a track record of advancing the frontiers of science, engineering or technology in areas of high societal impact. In their work, they exhibit exceptional creativity, thought leadership and high growth potential. Under the age of 40, these individuals have demonstrated their commitment to public service and actively play a transformational role in integrating scientific knowledge into society for the public good.

http://www3.weforum.org/docs/WEF_YoungScientists_Profiles_2013.pdf

The **Technology Pioneers** programme recognizes information technology and new media, energy and environment, and life sciences and health companies from around the world that are involved in the design, development and deployment of new technologies, and promises to significantly impact the way business and society operate.

<http://www.weforum.org/community/technology-pioneers>

The Global Gender Parity Group and Women Leaders communities consist of high-level women leaders from all walks of life who are committed to achieving gender parity. The communities serve as a platform for establishing meaningful dialogue on contemporary issues of relevance, including gender parity in STEM education and professions.

<http://www.weforum.org/women-leaders-and-gender-parity>

The **Global University Leaders Forum (GULF)** community of the presidents of top universities provides a non-competitive platform for high-level dialogue on issues of higher education and research with other sectors; it fosters collaboration between universities in areas of significance for global policy. Initiatives that have been facilitated by GULF include the Society for the Advancement of Science and Technology in the Arab World and the Réseau d'excellence des sciences de l'ingénieur de la Francophonie.

<http://www.weforum.org/academic-networks>

The Forum of **Young Global Leaders** is a community of exceptional young leaders who share a commitment to making the world a better place. Each year, the World Economic Forum identifies 200-300 extraordinary individuals worldwide. Together, they form a powerful international community that can dramatically impact the global future.

<http://www.weforum.org/community/forum-young-global-leaders>

Leaders from the Scientific Community



Global Science Policy Leaders

Leaders from institutions shaping research agendas at the global, regional and industry levels

*Ministry of Science and
Technology of the People's
Republic of China*



Wan Gang is Minister of Science and Technology of the People's Republic of China. He is also Vice-Chairman of the 11th Chinese People's Political Consultative Conference (CPPCC) and Chairman of the China Zhi Gong Party. Prior to government, he held a number of positions at Tongji University, including Dean of the New Energy Automobile Engineering Centre, Assistant President, Vice-President and President. He was also a Faculty Member at the university. Wan has a BA from Northeast Forestry University, an MA in Experimental Mechanics from Tongji University and a PhD in Engineering from the Technical University Clausthal, Germany.

Cabinet Office of Japan



Ichita Yamamoto is Minister of Science and Technology Policy and Minister of Space Policy of Japan. Prior, he was a Member of Japan's House of Councillors, State Secretary for Foreign Affairs, and Chairman of the Committee on Foreign Affairs and Defence in the House of Councillors. He also worked with the Japan International Cooperation Agency (JICA) and the United Nations Development Programme (UNDP). Yamamoto has an MSc in Foreign Service from Georgetown University.

*Japan Society for the
Promotion of Science*



Yuichiro Anzai is President of the Japan Society for the Promotion of Science (JSPS). As Japan's core funding agency supporting scientific advancement, JSPS administers grants for scientific research and other funding programmes to underwrite scientific research initiatives, cultivate budding researchers and promote international collaboration.

*European Research
Council*



Jean-Pierre Bourguignon is President of the European Research Council (ERC), which is responsible for encouraging the highest quality research in Europe through competitive funding and supporting investigator-driven frontier research across all fields, on the basis of scientific excellence. A mathematician by training, Bourguignon served as Director of the Institut des Hautes Études Scientifiques (IHÉS). He has received the Prix Paul Langevin, Prix du Rayonnement Français in Mathematical Sciences and Physics from the Académie des Sciences de Paris. He is a foreign Member of the Royal Spanish Academy of Sciences. In 2005, he was elected Honorary Member of the London Mathematical Society and has been the secretary of the mathematics section of the Academia Europaea. In 2008, Bourguignon was made Doctor Honoris Causa of Keio University in Japan and, in 2011, Doctor Honoris Causa of Nankai University in China.

*National Physical
Laboratory, UK*



Jane Burston is Head of the Centre for Carbon Measurement. The Centre works on climate science, carbon markets and clean technologies and comprises 150 scientists. It is based at the UK's National Measurement Institute, a laboratory that supports science understanding and technology innovation through measurement. She also lectures on emissions trading and carbon offsetting for two Master's programmes. Previously, Burston was Founder and Chief Executive Officer of Carbon Retirement, a social enterprise reforming emissions trading and carbon offsetting. In 2011, she was named one of Management Today's 35 High-flying Women under 35 and as Social Entrepreneur of the Year in Square Mile magazine.

*World Intellectual Property
Organization*



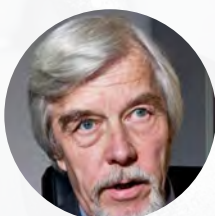
Francis Gurry is the Director-General of the World Intellectual Property Organization (WIPO). Under his leadership, WIPO is addressing challenges such as stress on the international patent and copyright systems due to rapid technological change; globalization and increased demand; narrowing the knowledge gap between developed and developing countries; and ensuring that the intellectual property system serves its fundamental purpose of encouraging creativity and innovation in all countries. Since 2012, he has served as Chair of the Chief Executives Board, High Level Committee on Management of the United Nations System.

Cabinet Office of Japan



Yuko Harayama is an Executive Member of the Council for Science and Technology Policy (CSTP), Cabinet Office of Japan. Previously, she served as the Deputy Director of the Directorate for Science, Technology and Industry at the Organisation for Economic Co-operation and Development (OECD). She is a Chevalier of the French Legion of Honour, recognized by the President of France for her research on science and technology policy. She was Professor in the Management Science and Technology Department at the Graduate School of Engineering of Tohoku University.

*European Organization for
Nuclear Research (CERN)*



Rolf-Dieter Heuer is Director-General of the European Council for Nuclear Research (CERN), in Switzerland, where he oversees efforts to discover the subatomic underpinnings of the universe using the 17-mile Large Hadron Collider.

National Institute of Mental Health, USA



Thomas Insel is Director of the National Institute of Mental Health (NIMH), the component of the US National Institutes of Health charged with generating the knowledge needed to understand, treat and prevent mental disorders. His tenure at NIMH has been distinguished by groundbreaking findings in practical clinical trials, autism research and the role of genetics in mental illness. Insel has served on numerous academic, scientific and professional committees and boards. He is a Member of the Institute of Medicine, a Fellow of the American College of Neuropsychopharmacology and a recipient of several awards, including the Outstanding Service Award from the US Public Health Service.

European Research Council



Sierd Cloetingh is a distinguished earth scientist and active member of the Scientific Council of the European Research Council (ERC) with a special interest in developing relations between the scientific community and industry at large. He is the Head of the Tectonics Group, Department of Earth Sciences, Faculty of Geosciences at Utrecht University in the Netherlands. His fields of scholarship include solid earth geophysics, tectonics, intraplate deformation, lithospheric dynamics, sedimentary basin evolution and sea level change.

The Nature Conservancy



Giulio Boccaletti is Managing Director for Global Water at The Nature Conservancy, representing over 400 scientists and practitioners working on the integration of natural capital in solving water and sustainability challenges across economic activities, communities and cities. Prior to joining The Nature Conservancy, Boccaletti was a Partner at McKinsey & Company, where he co-founded the firm's Global Water Resource initiative and was one of the leaders of its Sustainability and Resource Productivity practice. At McKinsey, he served public and private sector institutions on issues of regulatory strategy, growth, resource economics and, more recently, water security. Before joining McKinsey, Boccaletti was a climate scientist and physical oceanographer at the Massachusetts Institute of Technology. He holds a Master's degree in Theoretical Physics from the University of Bologna, Italy, and a Master's and PhD in Atmospheric and Oceanic Sciences from Princeton University, where he was a NASA Earth Systems Science Fellow.

National University of Singapore



Tan Chorh-Chuan is President, National University of Singapore. He has a degree in Medicine and a PhD from the National University of Singapore (NUS). Renal Physician. 1997-2000, Dean, Faculty of Medicine, NUS; 2000-04, Director, Medical Services, Ministry of Health, Singapore. Concurrently, Professor of Medicine, NUS. Deputy Chairman, Agency for Science, Technology and Research, Singapore. Chairman of the Board, National University Health System. Member, Board of Directors, Monetary Authority of Singapore. Fellow: Royal College of Physicians; Royal Australasian College of Physicians; American College of Physicians; Polish Academy of Medicine; Royal Geographical Society, UK. Recipient of several awards.

*Air and Water Conservation
Fund, National Geographic
Society*



Wen Bo is Programme Director of the Air and Water Conservation Fund, National Geographic Society, People's Republic of China. The fund supports field research, technology and conservation projects on water and air quality issues in China. Previously, Wen was the China Programme Director at Pacific Environment, where he supported environmental groups through development and production of exchange programmes, workshops and presentations in China. A conservation activist, he co-founded the China Green Student Forum, a network of more than 100 student environmental groups. He acts as the China Coordinator for the Global Greengrants Fund China Advisory Board. He holds a Master's degree in International Relations, KDI School of International Policy and Management in Seoul, South Korea, and graduated from Zhongnan University, Changsha, and the China School of Journalism in Beijing.

*Ministry of Education and
Science of Lithuania*



Dainius Pavalkis is Minister of Education and Science of Lithuania. Prior, he was a professor at the Lithuanian University of Health Sciences and a proctologist. Pavalkis is a member of the Lithuanian Labour Party and a member of the editorial boards of Lithuanian and foreign medical journals. He has published over 280 scientific papers and co-authored two textbooks. Pavalkis graduated from the Lithuanian University of Health Sciences as a medical doctor and did his clinical residency at the Moscow Research Institute of Proctology.

*Chinese Academy of Social
Sciences*



Pan Jiahua is Director of the Institute for Urban and Environmental Studies at the Chinese Academy of Social Sciences (CASS) and Professor of Economics at the CASS Graduate School. He is also a member of the China National Expert Panel on Climate Change and National Foreign Policy Advisory Committee, an adviser at the Ministry of Environment Protection, and Vice-President of the Chinese Energy Association and the Chinese Society for Ecological Economics. Pan was the lead author of the IPCC Working Group III's third, fourth and fifth Assessment Report on Mitigation. He is also the author of over 300 papers, articles and books in English and Chinese. Pan won first and second place prizes at CASS for best research (2002 and 2004), the Sun Yefang Economic Science Prize (2011), and the China Green Person of the Year (2010-2011). Pan received his PhD at the University of Cambridge.

*Institute of Public and
Environmental Affairs*



Ma Jun is Director of the Institute of Public and Environmental Affairs (IPE), a Chinese NGO committed to promoting transparency around pollution issues. Since its establishment in 2006, the IPE has developed the China Pollution Map Database, the first public database of corporate environmental performance in China. Ma was named as one of "The 100 Most Influential People in the World" by Time magazine in 2006, and was the winner of the 2012 Goldman Prize for his activism in increasing environmental information disclosure in China. He is also the author of "China's Water Crisis".

*Swiss Federal Institute of
Technology in Zurich (ETH
Zurich)*



Ralph Eichler has been the President of ETH Zurich in Switzerland since 2007. He has been a Member of the Executive Committee since 2008 and a Member of the ETH Board since 2004. Eichler earned a doctorate in physics at ETH Zurich and returned there as a professor in 1989. He was also Deputy Director and then Director of the Paul Scherrer Institute, where he served until 2007. Eichler is also on the boards of directors of Belenos Clean Power Holding and Venture Incubator. He is a member of the Swiss Academy of Engineering Sciences and of the Executive Committee at Energie Trialog Schweiz. He is also Vice-President of the Rectors' Conference of Swiss Universities.

*International Agency for
Research on Cancer*



Christopher P. Wild is the Director of the International Agency for Research on Cancer (IARC) in France. His research interests include understanding the interplay between environmental and genetic risk factors that cause human cancer. Wild joined IARC in 1987 as a staff scientist and later became Chief of the Unit of Environmental Carcinogenesis. Prior to IARC, he was a Professor and Chair of Molecular Epidemiology at the University of Leeds and Director of the Leeds Institute of Genetics, Health and Therapeutics. Wild obtained his PhD from the University of Manchester in the United Kingdom, and was awarded an IARC post-doctoral fellowship and subsequently a UK Royal Society European Exchange Fellowship at the Netherlands Cancer Institute in Amsterdam.

*Ministry of Communications,
Science and Technology of
Tanzania*



January Yusuf Makamba is Deputy Minister of Communications, Science and Technology of Tanzania, and since 2010 has been a Member of Parliament for the Bumbuli constituency. Prior, Makamba served as a Foreign Service Officer in the Ministry of Foreign Affairs and as an aide to Jakaya Kikwete, President of Tanzania. He also worked as a Research Assistant at the Carter Center and worked in Rwandan refugee camps, first as a Registration Clerk and later as an Assistant Camp Manager. Makamba is a Member of the CCM Youth Wing, and National CCM Youth League Governing Council. He is also the Director of the Tea Board of Tanzania and recipient of the Upper Midwest International Human Rights Fellowship at the University of Minnesota Human Rights Center. Makamba has a degree in Peace and Conflict Studies from St John's University in the US, and an MSc in Conflict Analysis and Resolution from George Mason University in Virginia.

*Korea Advanced Institute of
Science and Technology*



Sung-Mo "Steve" Kang is President of the Korea Advanced Institute of Science and Technology (KAIST). He has held a number of other academic positions, including Chancellor of the University of California, Merced, Dean of Engineering at the University of California, Santa Cruz, and Department Head of Electrical and Computer Engineering at the University of Illinois at Urbana-Champaign. He also led the development of the world's first 32-bit microprocessor chips as a technical supervisor at AT&T Bell Laboratories and designed satellite-based private communication networks as a member of technical staff. Kang holds 16 US patents and has published hundreds of papers in journals and premier conferences. In recognition of his contributions, Kang he was elected to be a fellow of IEEE, ACM and AAAS, and is a member of the Korea Academy of Science and Technology, and a foreign member of the National Academy of Engineering, Korea. He is also a member of the California Council on Science and Technology. Kang has received many awards, including the IEEE Millennium Medal, IEEE CAS Mac Van Valkenburg Society Award and IEEE CAS Society Technical Excellence Award. He has also been inducted into the Silicon Valley Engineering Hall of Fame.

*State Committee of
Science, Armenia*



Samvel Haroutiunian, Chair, State Committee of Science, Armenia. The State Committee of Science is the governmental body responsible for developing and implementing science policy in Armenia. Biophysicist. Professor and Doctor of Physical/Mathematical Sciences. 2006, Dean, Faculty of Physics, Yerevan State University (YSU); 2006-07, Vice-Rector on science policy and international issues, YSU; since 2007, Chair, State Committee of Science.

*Ministry of Education,
Culture, Sports, Science
and Technology of
Japan*



Hakubun Shimomura, Minister of Education, Culture, Sports, Science and Technology; Minister of Olympics and Paralympic Games of Japan. 1978, graduate, School of Education, Waseda University. 1989-96, Member, Tokyo Metropolitan Assembly. Since 1996, Member, House of Representatives; 2003, Deputy Sec.-General, LDP; Director, Cttee on Judicial Affairs. 2004, Vice-Minister for Education, Culture, Sports, Science and Tech.; 2005, Deputy Chairman, Diet Affairs Cttee; 2006, Deputy Chief Cabinet Secretary; 2007, Chairman, Cttee on Judicial Affairs; 2008, Deputy Chairman, Diet Affairs Cttee. 2009, Vice-Chairman, LDP Policy Research Council; 2010, Minister of Education, Culture, Sports, Science and Tech., and Minister of State for Special Missions (Science and Tech.), LDP Shadow Cabinet. 2012, Minister of Education, Culture, Sports, Science and Technology; Minister in charge of Education Rebuilding; Chairman, Headquarters for the Revitalization of Education; Special Adviser, Japan Cttee for UNICEF's Standing Cttee for School Education and Fund Raising.

Ministry of Economy of Israel



Avi Hasson, Chief Scientist; Director-General, Innovation and Industrial Research and Development Administration, Ministry of Economy of Israel. He has lectured extensively worldwide on venture capital and high-tech. Formerly: 10 years in leading telecommunication companies, such as ECI Telecom, ECtel and Tadiran Systems; 10 years as Partner, Gemini Israel Funds, managing investments in the communications, storage and consumer electronics sector; concurrently, active board member of various portfolio companies. The Office of the Chief Scientist is the government entity in charge of implementing government policy in support of industrial R&D. Its goal is to assist the development of technology in Israel as a means of fostering economic growth, encouraging technological innovation and entrepreneurship and encouraging R&D collaboration both nationally and internationally.

Chinese Academy of Social Sciences



Wang Weiguang, President, Chinese Academy of Social Sciences (CASS), People's Republic of China. PhD. Former Vice-President, Party School of the Central Committee of the Communist Party of China (CPC). Former Alternate Member, 17th CPC Central Committee. Currently, Member, 18th CPC Central Committee. Since 2013, President, Chinese Academy of Social Sciences (CASS); concurrently, President, Presidium, CASS Academic Divisions and Academic Member. Research focuses on the path and strategic issues of China's development.

Science, Technology and Innovation Council, Canada



Howard Alper, Chair and President, Science, Technology and Innovation Council, Canada. The Science, Technology and Innovation Council provides science and technology advice in response to requests by the Canadian government on a confidential basis. Currently: Distinguished University Professor, University of Ottawa. Former Chair: IAP-Global Network of Science Academies; Council of Canadian Academies; Canadian Research Knowledge Network. Former President, Royal Society of Canada. Member: Advisory Committee, US National Science Foundation on international science and engineering; Science Advisory Committee, World Economic Forum. Author of 580 papers and patents. Recipient of awards, including: Officer of the Order of Canada; Officer, National Order of Merit, France; Commander, Order of Merit of the Italian Republic.

*China Association for
Science and Technology,*



Chen Zhangliang, Vice-President, China Association for Science and Technology, People's Republic of China. 1987, PhD, Division of Biology and Biomedical Sciences, Washington University, USA. Successively Associate Professor, Full Professor and Dean, College of Life Sciences, Peking University; currently, Vice-President. Director, National Laboratory of Protein Engineering and Plant Genetic Engineering. Chair, Plant Biotech Committee, UNESCO. Vice-Chairman, China National Biotechnology Association. Member, Biotechnology Experts Committee, National 863 High-Tech Planning, and responsible for R&D of transgenic plants.



Science and Technology Faculty

Researchers and technologists at the vanguard of innovation

*Computer vision systems
and brain science*



David Cox is Assistant Professor of Molecular and Cellular Biology and Computer Science, and a member of the Center for Brain Science at Harvard University. Prior to joining MCB/CBS, he was a Junior Fellow at the Rowland Institute at Harvard, a multidisciplinary institute focused on high-risk, high-reward scientific research at the boundaries of traditional fields. His laboratory seeks to understand the computational underpinnings of high-level visual processing through concerted efforts in both reverse and forward engineering. To this end, his group employs a wide range of experimental techniques – from microelectrode recordings in living brains to visual psychophysics in humans – to probe natural systems, while developing practical computer vision systems based on what is learned about the brain.

Nanocrystals



Hyunjoo Lee is Associate Professor in the Department of Chemical and Biomolecular Engineering at the Korea Advanced Institute of Science and Technology (KAIST) in South Korea. Lee is researching nanocrystals and their applications in nanotechnology for the design of new and more efficient solutions to sustainable energy and materials. She is the recipient of awards for excellence in research and teaching from Yonsei University and the Chemical Society of Japan.

Geoengineering



Tim Kruger manages the Oxford Geoengineering Programme, an initiative of the Oxford Martin School, which assesses proposed techniques to counter climate change by either reflecting some of the sun's light back into space or by removing carbon dioxide from the atmosphere. The programme also explores whether adding alkaline materials to the oceans can safely counter ocean acidification. Kruger has a broad interest in the potential of proposed geoengineering techniques as a response to climate change, and in the governance issues associated with them. He is the author of Oxford Principles, a set of guidelines for the responsible conduct of geoengineering research.

Robotics



Li Zexiang is a Professor of Electrical and Electronic Engineering at the Hong Kong University of Science and Technology. His research focuses on robot manipulation, multifingered robotic hands, geometric analysis of robotic mechanisms; intelligent control and nonlinear systems; computer-aided design and manufacturing, and computational metrology. Li was a research scientist in the Artificial Intelligence Laboratory of MIT and as an Assistant Professor in the Robotics and Manufacturing Laboratory of New York University. He received the National Natural Science Award (3rd class) from China, the University Scholar Award from Carnegie-Mellon University, the E.I. Jury Award from UC Berkeley, the Research Initiation Award from the National Science Foundation, the ALCOA Fellowship from the ALCOA Foundation and the E. Anthony Fellowship from UC Berkeley.

Wearable technologies



Thad Starner one of the world's leading experts and a pioneer of wearable computing technologies. He has contributed to breakthrough research in augmented reality and gesture recognition. The Founder and Director of the Contextual Computing Group at Georgia Institute of Technology's College of Computing, he is also a Technical Lead and Manager on Google's Project Glass. His research creates computational interfaces and agents for use in everyday mobile environments, combining wearable and ubiquitous computing technologies with techniques from the fields of artificial intelligence, pattern recognition and human-to-computer interaction.

Advanced manufacturing and 3D printing



Fugee Tsung is Professor and Head of the Department of Industrial Engineering and Logistics Management (IELM) at the Hong Kong University of Science and Technology (HKUST). His research focuses on advanced manufacturing, including 3D printing, quality engineering and management; statistical process control, monitoring and diagnosis; design of experiments and Taguchi methods; six sigma implementation; statistical data mining; and knowledge discovery.

Climate change, extreme events and land-climate dynamics



Sonia I. Seneviratne is Associate Professor of Land-Climate Dynamics at the Institute for Atmospheric and Climate Science at ETH Zurich. Sonia has held research positions at MIT and NASA Goddard Space Flight Center; in 2009-2012 she was Coordinating Lead Author of the IPCC Special Report on Managing the Risks of Extreme Events and Disasters to Advance Climate Change Adaptation. She is the recipient of the 2013 Macelwane Medal for research, bestowed by the American Geophysical Union. Her research interests include climate change and extreme events, climate feedback effects, land-climate interactions such as soil moisture dynamics, climate-relevant vegetation processes and the interface between water, energy and biogeochemical cycles.

*Networked technology
and the internet of things*



Qian Zhang is a Professor in the Department of Computer Science and Engineering at Hong Kong University of Science and Technology (HKUST), where she specializes in networked technology and internet of things. Her current research focuses on cognitive and cooperative networks, dynamic spectrum access and management, as well as wireless sensor networks. Zhang has published more than 300 peer reviewed papers. As an inventor, she holds around 30 pending international patents.

*Cognitive neuroscience
and understanding
autism*



Marlene Behrmann is a Professor of Psychology and Co-Director of the Center for the Neural Basis of Cognition (CNBC) at Carnegie Mellon University in Pittsburgh, USA. Behrmann specializes in the cognitive neuroscience of visual perception, adopting an interdisciplinary approach to investigate the psychological and neural mechanisms by which signals from the eye are transformed into meaningful percepts by the brain in normal and brain-damaged individuals. She also focuses on analysing large datasets from functional and structural imaging to elucidate the neural profiles of autism and other neurodevelopmental disorders. Behrmann has a BA in Speech and Hearing Therapy and an MA in Speech Pathology from the University of Witwatersrand, South Africa, and a PhD in Psychology from the University of Toronto, Canada.

*Molecular epidemiology
of chronic diseases*



Chia Kee Seng is a medical epidemiologist and has published over 150 papers, authored chapters and edited books on chronic disease epidemiology, molecular epidemiology and occupational health. He is a Professor in the Department of Community, Occupational & Family Medicine at the National University of Singapore; Director of the NUS-GIS Centre for Molecular Epidemiology; and Foreign Adjunct Professor in Epidemiology at the Karolinska Institutet. His current research focuses on the molecular epidemiology of chronic diseases. To that end, Chia is setting up cohort studies for translational research to elucidate gene-environment interactions in chronic disease causation, prevention and therapy.

Theoretical physics



Lawrence M. Krauss is Professor and Director of the Origins Project at Arizona State University, USA. He is exploring issues from the origin of universe to consciousness. Krauss is also a theoretical physicist and Professor at the School of Earth and Space Exploration, Arizona State University. His research focuses on the interface between elementary particle physics and cosmology. He serves as Chair of the Board, Bulletin of Atomic Scientists, and is a Member of the Board, Federation of American Scientists. He is the recipient of awards, including the Lillienfeld Prize, APS; Oersted Medal, AAPT; Gemant Award, AIP & NSF Public Welfare Medal.

*Bioengineering and
biotechnology*



Sang Yup Lee is one of the world's leading experts in bioengineering and biotechnology. He is Dean of the KAIST Institutes at the Korea Advanced Institute of Science and Technology in South Korea, where he is also a Distinguished Professor of Chemical and Biomolecular Engineering, Bio and Brain Engineering and Biological Sciences. His research has focused on metabolic engineering, biochemical engineering, biopolymer polyhydroxyalkanoate (PHA), poly-gamma-glutamic acid (PGA), directed evolution, cell surface display, chiral compounds, DNA chip (transcriptome analysis, genetic diagnosis), proteomics and silico biotechnology (metabolomics, genome to metabolism).

*Science of education and
learning*



Marsha Lovett is a Teaching Professor in the Department of Psychology at Carnegie Mellon University in the US. She is also the Director of the Eberly Center for Teaching Excellence, where she applies theoretical and empirical principles from cognitive psychology to help faculty improve their teaching. Lovett has also developed several innovative, educational technologies to promote student learning and metacognition, including StatTutor, an intelligent tutoring system for statistics, and the Learning Dashboard, a learning analytics system that promotes adaptive teaching and learning in online instruction. She has published more than 50 research articles on learning and instruction. Lovett received a PhD in Cognitive Psychology from Carnegie Mellon University.

*Genomics and public
health*



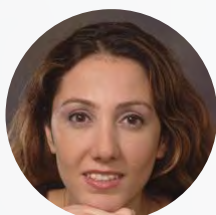
Yik Ying Teo is an Associate Professor at the Saw Swee Hock School of Public Health (SSHSPH) at the National University of Singapore, where he heads the Statistical Genomics Programme and the Biostatistics Domain. He is also an Adjunct Visiting Group Leader at the Genome Institute of Singapore, Agency for Science, Technology and Research (A*STAR). His research uses statistical analysis to help apply the knowledge of genomics science to the field of public health.

Sensors and smart infrastructure



James H. Garrett Jr is Dean of the College of Engineering at Carnegie Mellon University. He is also the Thomas Lord Professor of Civil and Environmental Engineering, and served as Head of the Department of Civil and Environmental Engineering. Earlier, he was Associate Dean for Academic and Graduate Affairs and a faculty co-director of the Smarter Infrastructure Incubator (SII), a research centre for creating and evaluating sensing, data analytics and intelligent decision support for improving the construction, management and operation of infrastructure systems. His interests are oriented towards applications of sensors and sensor systems to civil infrastructure condition assessment; application of data mining and machine learning techniques for infrastructure management problems in civil and environmental engineering; mobile hardware/software systems for field applications; representations and processing strategies to support the usage of engineering codes, standards, and specifications; and knowledge-based decision support systems. Garrett has published his research in over 60 refereed journal articles, over 80 refereed conference papers, over 90 other conference papers and 10 sections or chapters in books or monographs. He is also the Co-Chief Editor of the ASCE Journal of Computing in Civil Engineering. He holds a PhD in Civil Engineering from Carnegie Mellon University.

Genomics and Ebola response



Pardis Sabeti is an Associate Professor at the Center for Systems Biology at Harvard University, and a Senior Associate Member of the Broad Institute of MIT and Harvard. She is a computational geneticist with expertise in developing algorithms to detect genetic signatures of adaptation in humans and the microbial organisms that infect humans. Her works focus on the Ebola and Lassa viruses, Plasmodium falciparum malaria and vibrio cholera. Sabeti completed her undergraduate degree at MIT, her PhD as a Rhodes Scholar at University of Oxford and her MD as a Soros Fellow at Harvard Medical School, where she was only the third woman to graduate summa cum laude. Her work is supported by a Burroughs Wellcome Fund Career Award, a Packard Foundation Fellowship, an NIH Innovator award and awards from NIAID, DTRA and the Gates Foundation. She is on the National Academy of Sciences Committee on Women in Science, Medicine and Engineering, and is also the lead singer of the rock band, Thousand Days.

Flexible materials and nano devices



Lee Keon Jae is an Associate Professor, Department of Materials Science and Engineering at the Korea Advanced Institute of Science and Technology (KAIST). He received his PhD in 2006 from the University of Illinois. His current research focuses on flexible and nano devices for bio, energy and electronics; laser systems for the future flexible nanoelectronics; and graphene. Lee has authored and co-authored papers for Science, Nature Materials, Nano Letters, Advanced Materials and ACS Nano, among others. Lee holds some 120 patents, 40 of which are licensed.

Robotics



Manuela M. Veloso is the Herbert A. Simon Professor in Computer Science and Robotics at Carnegie Mellon University, where her research interests include artificial intelligence and robotics. She is also leads the university's CORAL (Collaborate, Observe, Reason, Act and Learn) research group on intelligent robots. Veloso is the President-Elect of the Association for the Advancement of Artificial Intelligence (AAAI), and a former president of the International RoboCup Federation. She is also a Fellow at IEEE, AAAS and AAAI. Veloso received her PhD in Computer Science from Carnegie Mellon University.

Artificial Intelligence



Andrew Ng is a Co-Founder of Coursera and Director of the Stanford Artificial Intelligence Lab, the main AI research organization at Stanford University. At Stanford, he teaches and focuses on machine learning, artificial intelligence and robotics; most universities doing robotics research are using a software platform (ROS) from his group. In 2008, Ng started SEE (Stanford Engineering Everywhere), which was Stanford's first attempt at free, online distributed education. Since then, over 200,000 people have viewed his machine learning lectures on YouTube, and over 1 million people have viewed his and other SEE classes' videos. Ng is the author or co-author of over 100 published papers on machine learning. His work in learning, robotics and computer vision has been featured in press releases and reviews. In 2008, Ng was featured in Technology Review's TR35, a list of "35 remarkable innovators under the age of 35". In 2009, he received the IJCAI Computers and Thought award, one of the highest honors in AI.

Diversity



Victoria Plaut is a Professor of Law and Social Science at the Law School of the University of California, Berkeley. Her research and classes focus on incorporating empirical psychological research related to issues of diversity and culture into the design of legal institutions and organizations. Prior, she was Assistant Professor of Psychology at the University of Georgia and taught at the College of the Holy Cross in Worcester, Massachusetts. Plaut's research on diversity, culture and inclusion aims to address the challenges and opportunities of working, living and learning in diverse environments. She has a related line of work on cultural psychology, including cultural models of success, self, well-being, relationship and law. Plaut has authored over 30 publications, including articles in the leading journals in her field, such as *Psychological Science* and the *Journal of Personality and Social Psychology*. Her research has been supported by the National Science Foundation, the National Institutes of Health, private organizations and internal university grants.

Future of energy storage



Ichiro Sakata is a Professor in the Faculty of Engineering and Director of the Innovation Policy Research Center at the University of Tokyo. He has 20 years of experience as a senior policy analyst and director at the Japanese Ministry of Economy, Trade and Industry, and is an adviser to the Japanese Minister of Reconstruction. Sakata's research interests include technology management, technology roadmap and innovation network, focusing on rapidly growing knowledge sectors such as clean energy. He has published more than 100 papers in peer-reviewed journals and international conference proceedings.

Behavioural Science



Olivier Oullier is Professor of Behavioural and Brain Sciences at Aix-Marseille University in France, where his research interests focus on complex systems, human movement science, neuroscience and psychology. Since 2013, Oullier has contributed to the Parliamentary Office for the Evaluation of Scientific and Technological Choices. Prior, he was Head of the Neuroscience and Public Policy Programme at the Centre for Strategic Analysis under the office of the Prime Minister of France. Oullier is a Member of the Presidential Obesity Plan Steering Committee and the High Council for Strategic Education and Research. He is also a World Economic Forum Young Global Leader, a Member of the Forum's Global Agenda Council on Neuroscience & Behaviour, and a Founding Curator of the Global Shapers' Marseille Hub. Oullier received a PhD from the University of the Mediterranean and is a PhD candidate in Economics at EHESS.

Robotics



Xiong Rong is a Professor at the Institute of Cyber Systems and Control at China's Zhejiang University. Her research interests include visual recognition, simultaneous localization and mapping, motion planning and control for robots. Her research group has successfully developed two humanoid robots which can play table tennis with each other and against a human player. Xiong has an MSc in Computer Science and Engineering and a PhD in Control Science and Engineering from Zhejiang University.

Economics of risk



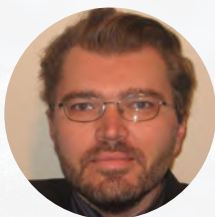
Wanda Mimra is Assistant Professor of Risk and Insurance Economics at the Department of Management, Technology and Economics of ETH Zürich. Her research focuses on the microeconomics of insurance markets, in particular on the efficiency of insurance markets under asymmetric information, industrial organization of insurance markets and insurance regulation. Her research interests extend to related topics in health economics such as quality and provider payments in health insurance organizations.

Nano and biotechnology



Xu Luping is the Deputy Director, Center for Nano and Micro Mechanics at Tsinghua University, People's Republic of China. Xu's expertise includes nano biotechnology, systems biology and complex systems. He is particularly interested in exploring and reinventing methods and tools for innovation in education, research and social entrepreneurship. Previously, Xu spent four years in research and diverse exploration of innovation in education and research in Paris, France. Xu is also a Co-Founding Member and Deputy Director, XIN Center, Tsinghua University.

Quantum technologies



Vlatko Vedral is Co-Director of the Oxford Martin Programme on Bio-Inspired Quantum Technologies at the University of Oxford and Professor of Theoretical Quantum Optics within the Department of Physics. Throughout his career, he has held a number of visiting professorships at different international institutions. He has published over 200 papers on quantum physics and has written two textbooks, as well as a popular science book, "Decoding Reality: The Universe as Quantum Information". Vedral studied theoretical physics at Imperial College, London, from where he also received his PhD on Quantum Information Theory of Entanglement.

Nanomaterials and graphene



Sang Ouk Kim is a leading authority on next-generation semiconductor processing and advanced materials based on nano-scale science and engineering. His research focuses on directed molecular assembly of soft nanomaterials including polymers, liquid crystals, and peptide molecules; nanodevice fabrication based on molecular self-assembly; and carbon nanotube or graphene synthesis and assembly. He is an Associate Professor in the Department of Materials Science and Engineering at the Korea Advanced Institute of Science and Technology (KAIST) in South Korea.

Global risks



Wolfgang Kröger is Executive Director of the ETH Risk Center and Founding Rector of the International Risk Governance Council. His most recent research focuses on the analysis and optimization of complex technical systems. He has served on international committees and advisory boards, is a member of the Swiss Academy of Engineering Sciences and a recipient of the Distinguished Affiliate Professor award of TU Munich.

Air pollutants and public health



Yu Liya is an Associate Professor in the Department of Civil and Environmental Engineering at the National University of Singapore. Her research group focuses on the characterization of atmospheric particulates and air quality with specific interest in how the transboundary biomass-burning smoke in South-East Asia affects the urban environment. Yu is also working closely with her colleagues in civil engineering to explore how to enable buildings in large cities to mitigate airborne pollutants. In collaboration with the YLL School of Medicine at the National University of Singapore, she is studying the health impacts of airborne particles. Yu holds a PhD from Stanford University.

Public health and social media



Mohan Jyoti Dutta is Professor and Head, Department of Communications and New Media at the National University of Singapore, where his research investigates methods to maximize public health communication via social media. He is also Provost Chair Professor and Head, Department of Communications and New Media, and Founding Director of the Center for Culture-Centered Approach to Research and Evaluation (CARE), where he directs research on culturally centred, community-based projects of social change communication.

Artificial intelligence and language



Wu Dekai is a Professor at the Department of Computer Science and Engineering at Hong Kong University of Science and Technology. His cross-disciplinary work relates language, music, artificial intelligence, cognition, evolution and culture. In 2011 he was named Founding ACL Fellow at the Association for Computational Linguistics for pioneering contributions to machine learning of the relationships between different languages. His research has contributed to developing foundations of modern statistical machine translation technology, and built the world's first Web translator.

Human-computer interaction



Justine Cassell is the Charles M. Geschke Director of the Human-Computer Interaction Institute, School of Computer Science at Carnegie Mellon University. She is also Associate Vice-Provost for Technology Strategy and Impact at Carnegie Mellon University and Co-Director of the Simon Initiative. Cassell's research interests originated in the study of human-human conversation and storytelling and progressed to allowing computational systems to participate in these activities. Increasingly, her research has come to address the impact and benefits of technologies on learning and communication. In particular, Cassell is credited with developing the Embodied Conversational Agent (ECA), a virtual human capable of interacting with humans using both language and nonverbal behavior. More recently she has investigated the role that the ECA can play in children's lives, as a Story Listening System (SLS): peer support for learning language and literacy skills.

*Cities, ecology and
science for public policy*



Peter Edwards is Director of the Singapore-ETH Center, Future Cities Laboratory, where his work focuses on the application of science and technology for better public policy. Since 1993 he has been Professor of Plant Ecology at ETH where he has also served as Chairman and Dean of the Department of Environmental Systems Science. He was a founder and the first Executive Secretary of the Institute for Ecology and Environmental Management, a professional organization for environmental practitioners.



New Champions in Science and Technology

Young Global Leader



Alvaro Fernández Ibáñez is Co-Founder and Chief Executive Officer of SharpBrains, a leading market research firm covering applications of neuroscience and cognitive science in education and healthcare. He recently co-authored the book *The SharpBrains Guide to Brain Fitness* with neuropsychologist Elkhonon Goldberg. He holds a Master's in Education and Business from Stanford University, and teaches at the UC Berkeley Osher Lifelong Learning Institute. Fernández Ibáñez is often quoted in the media, including *The Wall Street Journal*, *The New York Times* and CNN.

Young Global Leader



Christian Mandl is the Co-Founder and Managing Partner of Neulogy Ventures, a joint venture with Neulogy, Slovakia's leading innovation catalyst; and 3TS Capital Partners, one of the leading private equity and venture capital firms in Central and Eastern Europe. Mandl, an internationally active business angel, co-founded SkyEurope, a Central European low-cost airline, which he managed until 2007 as Chief Executive Officer. He took SkyEurope public on the Vienna and Warsaw stock exchanges in 2005 before exiting his investment in 2007. In 2009, Mandl took over the assets of Maporama, a leading French provider of digital mapping solutions for professional users. He restructured the company and sold it in March 2013 to TIBCO Software, a NASDAQ-listed company.

Young Global Leader



David Rosenberg is Co-Founder and Chief Executive Officer of AeroFarms, a clean-technology company that builds and operates advanced vertical farms in urban environments. He is also Co-Founder of Hycrete, a cleantech nanotechnology company leading in waterproofing and corrosion control solutions for concrete construction. Rosenberg is Chairman of the Board of Advisers of the software company AgSquared, a venture adviser to the Russian cleantech venture capital fund of Wermuth Asset Management, and is a Board Member of the non-profit Ecologic Sequestration Trust. He is also an Adjunct Professor, teaching venture capital financing at NYU's Stern School of Business. Rosenberg received his BA from UNC Chapel Hill and an MBA from Columbia University. He competed for the US in fencing for six years and is a three-time US National Fencing Champion.

Young Global Leader



Jason Li Yat-Sen has been Director of the George Institute for Global Health, People's Republic of China, since 2010. The institute is a global medical research organization and social business that has built a large programme of healthcare research and enterprise spanning over 50 countries worldwide. It aims to improve the health of millions of people worldwide and employs more than 300 staff in offices in Australia, the UK, China and India. Li Yat-Sen holds a Law degree from the University of Sydney and a Master's of Law from New York University Law School, where he was Australia's Hauser Global Fellow for 2000.

Technology Pioneer



Nathan Eagle is an expert on mobile phones in emerging markets. His PhD work at MIT on reality mining was declared one of the 10 technologies most likely to change the way we live by the MIT Technology Review. His research involves how data generated about human movements, financial transactions and communication patterns can be used for social good. He is the Chief Executive Officer of Jana Mobile and Adjunct Assistant Professor of Epidemiology at Harvard University. He is the recipient of honours and awards, including: TR35, a group of the world's top innovators under 35, MIT (2009); Advertising Age's 40 under 40 (2014).

Young Global Leader



Javier Garcia-Martinez is Co-Founder of Rive Technology, a clean energy company commercializing advanced catalyst technology. The proprietary technology, invented by Garcia-Martinez during his post-doc MIT, makes traditional zeolite catalysts more accessible to large hydrocarbon molecules. He was awarded the 2005 Europa Medal, presented to the outstanding European chemist under the age of 35, and received the Silver Medal of the European Young Chemist Award in 2006. Garcia-Martinez is also Professor of Chemistry and Director of the Nanotechnology Molecular Laboratory at the University of Alicante, Spain. He has been published extensively in the areas of nanomaterials, catalysis and energy. His latest books include Nanotechnology for the Energy Challenge and The Chemical Element: Chemistry's Contribution to our Global Future. In 2007, he received the TR 35 Award from MIT's Technology Review magazine. He is a Fellow of the Royal Society of Chemistry and Member of the Global Young Academy and the Bureau of the International Union of Pure and Applied Chemistry.

Young Global Leader



Dries Buytaert is passionate about technology innovation, social media and photography. He is Founder and Project Lead of Drupal, a pioneer in open source web publishing and collaboration platforms, and serves as President of the Drupal Association, a non-profit organization formed to help Drupal flourish. Drupal is an open source content management platform powering 2% of all websites on the internet. It is built, used and supported by an active and diverse community of people around the world. While the Drupal community generates the most sophisticated software for free, profitability is generated through its commercial arm, the venture-backed Acquia, which provides products, services and technical support for Drupal users. Buytaert Co-Founded Acquia in 2007, which was ranked by Inc. magazine in 2012 as the first among software companies, an exclusive ranking of the nation's fastest-growing private companies. Buytaert holds a PhD in Computer Science and Engineering from Ghent University and a Licentiate Computer Science (MsC) from the University of Antwerp.

Young Global Leader



Jeremy Howard is a serial entrepreneur, business strategist, developer and educator. He is the President and Chief Scientist of Kaggle and is the youngest faculty member at Singularity University, where he teaches data science. Howard was the founding chief executive of two successful self-funded Australian start-ups (FastMail and Optimal Decisions Group), both of which grew internationally and were sold to large international companies. He spent eight years in management consulting at the world's most exclusive firms, including McKinsey & Co. and AT Kearney. Howard has mentored and advised many start-ups and is an angel investor. He has contributed to a range of open source projects as a developer, and is also in demand as an expert commentator on various TV news programmes.

Technology Pioneer



Nick Leschly has been the President and Chief Executive Officer of bluebird bio since 2010. The company develops next-generation products based on gene therapy to treat patients with severe genetic and orphan diseases by addressing the underlying cause of their disease. Formerly a partner of Third Rock Ventures since its founding in 2007, Leschly played an integral role in the overall formation, development and business strategy of several of Third Rock's portfolio companies. Prior to joining Third Rock, Leschly worked at Millennium Pharmaceuticals, leading early-stage drug development programmes and serving as the product and alliance leader for Velcade. Leschly also founded and served as Chief Executive Officer of MedXtend Corporation. He received his BSc in Molecular Biology from Princeton University and his MBA from the Wharton Business School. He currently serves as a member of the Biotechnology Industry Organization board.

Young Global Leader



Bruno Sánchez-Andrade Nuño is Chief Scientist at Mapbox, a start-up focused on widening the impact of open data, maps and satellite imaging. Prior to Mapbox, he was Director of Science and Technology at GAIN, an NGO bringing open data to measure climate change adaptation challenges. He is an author and speaker on science and technology outreach, and serves on various boards of technology companies and climate change initiatives. He has also worked with NASA satellites and space rockets. Sánchez-Andrade Nuño was a Mirzayan Fellow of the US National Academies of Sciences and a Member of AEGEE (European Students Forum). He earned a PhD in Astrophysics from the Max Planck Institute.

Technology Pioneer



Alexander Ljung is the Co-Founder and Chief Executive Officer of SoundCloud, which he launched in 2008 with Co-Founder and CTO Eric Wahlfross. SoundCloud is an audio platform that allows anyone to upload, record, track, promote and share their sounds on the web. He began his career working in sound design for feature films. As CEO, Ljung oversees vision, strategy and leadership, with a global team of more than 200 people. He is a member of the Cloud Appreciation Society, and was named European Tech Entrepreneur of the Year in 2013.

Young Global Leader



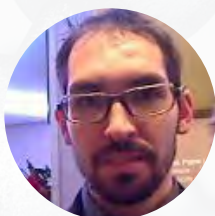
Tan Le is Founder and Chief Executive Officer of Emotiv Lifesciences, a bio-informatics company offering a platform for crowdsourced brain research. The platform leverages cloud computing, huge datasets, mobile brain imaging technology and highly contextualized, personal data. With a fast-growing install base of brain imaging systems across more than 90 countries, Emotiv Lifesciences allows organizations to rapidly collect brain data on the precise characteristics of a target demographic. The platform makes it possible for organizations to leverage the talent of multidisciplinary researchers across mathematics, statistics, signal processing, artificial intelligence, data mining, image processing, biology and medicine to analyse data and provide meaningful analysis and discoveries. Tan was Young Australian of the Year in 1998 and voted one of Australia's 30 Most Successful Women Under 30 in that same year. She was named among Fast Company's Most Influential Women in Technology (2010) and Forbes' Names You Need to Know (2011). She also received the Monash Distinguished Alumni Award (2011) and the Advance Global Australian Award for ICT (2012).

Technology Pioneer



Matthew L. Scullin has nearly a decade of experience in thermoelectrics and is one of the industry's top experts. He holds a PhD in Materials Science from UC Berkeley, and is the Chief Executive Officer of Alphabet Energy, USA. Scullin is a thought leader in waste-heat recovery and energy efficiency. He is the holder of 12 patents issued and pending, and author of more than a dozen peer-reviewed papers and conference proceedings. In 2012, Scullin was named as one of the Forbes 30 Under 30.

Technology Pioneer



Jorge Soto is the Founder of Data4, Mexico. He has been involved in several organizations using technology to improve communications between citizens and their institutions, with the philosophy that technology, transparency and accountability are fundamental to creating strong links with communities and improving the government. Since 2013, he has served as the Deputy General Director of Civic Innovation, National Digital Strategy, Office of the Presidency of Mexico, to develop strategies and projects that encourage civic participation, transparency, accountability and innovation in Mexico. He has been recognized as an Endeavor Global Entrepreneur, Ashoka Fellow and MIT TR35.

Technology Pioneer



Hank C. K. Wuh is a surgeon, inventor and entrepreneur. He is also Chairman of TruTag Technologies, a data-rich security platform for the authentication and anti-counterfeiting of food, medicine and industrial components. He has led the development of over 20 biomedical innovations. He was the Chief Executive Officer of SKAI Ventures, a global venture accelerator focused on transforming ideas into disruptive technologies; and Chairman of Eyegenix, developing an artificial cornea to treat blindness. He received his MD from Johns Hopkins University and specialized in Orthopaedic Surgery at Stanford University.

Technology Pioneer



Michael Altendorf is Chief Executive Officer and Co-Founder, Adtelligence, a platform allowing websites to be constructed on the fly, based on information about the person who has just clicked through to it. Adtelligence improves on the traditional approach of creating bespoke landing pages by automating the process, optimizing for the “long tail” of relatively rare keywords. Secondly, it makes it easier to experiment with different site designs, and – through the power of big data and machine learning – automatically identify what works and optimize accordingly.

Technology Pioneer



Maarten Michielssens is Chief Executive Officer of EcoNation which produces the LightCatcher, a revolutionary design of domed skylight. The LightCatcher has a solar-powered sensor system that tracks the lightest point in the sky and controls a mirror that optimizes the amount of daylight coming in. Customers face no upfront cost, and start saving immediately: EcoNation funds the installation of LightCatchers on customers’ premises, and charges for them in monthly instalments that are guaranteed to be lower than the customers’ previous electricity bills. This is made possible by technology that enables EcoNation to automatically monitor light levels in its customers’ premises, and remotely switch off artificial lights when enough light is coming in through the LightCatchers. Energy cost savings typically range from 50% to 70%.

Technology Pioneer



Jennifer Buechel is Director at D-Rev, USA. Buechel’s commitment to D-Rev’s mission stems from her interest in integrating business principles with non-profit missions in innovative ways. Previously, Buechel participated in a variety of roles for organizations that enable under-served populations, such as the Toronto Daily Bread Food Bank, Big Sisters, and I Have a Dream. Throughout her professional, for-profit career, Buechel has sought to contribute to organizations with a social purpose and mission. She brings significant operations and product management experience from companies such as Procter and Gamble, McKinsey, Genentech and, most recently, SunEdison. Buechel holds a BSc App Sci in Chemical Engineering and a BA in English from Queen’s University in Canada, as well as an MBA and an MS in Manufacturing Systems Engineering from Stanford

Technology Pioneer



Temitope Ola is Chief Executive Officer of Koemei SA, a company using innovative automated speech recognition software to make the spoken words in video content searchable online just as easily as text. The software can transcribe lectures and long-form discussions, distinguishing among up to 10 voices for around a 20th of the cost of manual transcriptions. Koemi SA applying this technology to increase the potential of education online as well as internet accessibility for the disabled.

Technology Pioneer



Gerald Loeb is co-founder and Chief Executive Officer of Syntouch, a spin-off company from the Medical Device Development Facility of the University of Southern California, which Loeb directs as Professor of Biomedical Engineering. He is a co-inventor of the BioTac technology among his more than 50 issued US patents covering many areas of neural engineering and prosthetics. Syntouch has developed the world's first robotic finger that can feel in the same way as a human finger. The SynTouch BioTac is a tactile sensor that registers the three modalities that give humans sensory feedback from their fingertips – force, vibration and temperature. It offers potential for robots to become much more dexterous and better able to perform a wide range of tasks.

Technology Pioneer



Nathan Blecharczyk is Chief Technology Officer and Co-Founder of Airbnb, an online company that connects travellers with people who can accommodate them. He oversees the technical strategy of the company and is dedicated to building a team of world-class engineers to keep Airbnb at the forefront of the industry. Nathan became an entrepreneur running a business while he was in high school, selling to clients in more than 20 countries. He received a degree in Computer Science from Harvard University and held several engineering positions with Microsoft, OPNET Technologies and Batiq before becoming a co-founder at Airbnb.

Technology Pioneer



Amit Narayan is Founder and Chief Executive Officer of AutoGrid, Inc. In 2010-2012, he was the Director of Smart Grid Research in Modeling & Simulation at Stanford University, where he continues to lead an interdisciplinary project related to modeling, optimization and control of the electricity grid and associated electricity markets. Prior to founding AutoGrid, Narayan was the Vice-President of Products at the publicly traded company Magma Design Automation, Inc. (Nasdaq: LAVA), where he led product development and product management teams responsible for Magma's flagship product in the design implementation area. Over one third of all semiconductor chips used in consumer electronic devices – such as smart phones, blue-ray players and video games – were designed using products developed by Narayan's team at Magma. He received a B. Tech. in Electrical Engineering from the Indian Institute of Technology at Kanpur and a Ph.D. from the University of California at Berkeley. He has published over 25 papers about design automation, holds seven US patents and is an active advisor to several startup companies in the Bay Area.

Technology Pioneer



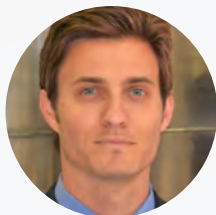
Matthew Silver is Founder and Chief Executive Officer of Cambrian Innovation Inc., a water and bio-energy technology provider headquartered in Boston. Founded at MIT in 2006, Cambrian Innovation develops advanced environmental solutions for corporate, government and agricultural clients. Cambrian has been supported by NASA, EPA, DOD, NSF, and USDA, won the Clean Tech Open in 2009, and was selected as a top 50 global emerging water company by the Artemis Project in 2012. Matt has published over 15 academic publications and in 2011 testified before the United States Senate on the government's role in early stage innovation. He was a Research Scientist at the MIT Space Systems Lab and System Engineer at the Canadian Space Agency, during which he participated in two field expeditions to the High Canadian Arctic to operate and test exploration systems in extreme environments. Matt received a PhD in Engineering Systems and two Master's degrees in Astronautical Engineering and Technology and Policy from the Massachusetts Institute of Technology.

Technology Pioneer



Helmy Eltoukhy is Chief Executive Officer of Guardant Health. Eltoukhy is a serial entrepreneur and pioneer in the biotech industry. After receiving his PhD, MS and BS degrees in electrical engineering from Stanford University, he joined the Stanford Genome Technology Center (SGTC) in 2006 to work on low-cost DNA sequencing technologies. At SGTC, he developed the first semiconductor sequencing platform and first base-calling algorithm for next-gen sequencing. In 2007, he co-founded Avantome to commercialize a low-cost, high-performance next-gen sequencing platform to seed the democratization of next-gen sequencing. As its founding CEO, he led Avantome through two rounds of financing and through acquisition by Illumina in 2008. At Illumina, Helmy was Sr Director of Advanced Technology Research, where he developed novel chemistries, hardware and informatics for genetic analysis systems

Technology Pioneer



Mark D. Herrema is Co-Founder and Chief Executive Officer of Newlight, Herrema has over a decade of industrial experience in chemical, biological, and process engineering, intellectual property development, polymer functionalization, private equity finance and strategic business development. Herrema has invented a range of proprietary carbon capture and conversion systems and materials, receiving numerous associated US and international patents, steering Newlight through multiple private placement offerings, executing a range of strategic partnerships, and leading the engineering, construction, optimization and expansion of Newlight's carbon capture platform. Herrema graduated *magna cum laude* High Honors from Princeton University with a BA degree in Politics and Political Theory, with additional work in Physics, Mathematics, and Chemistry.

Technology Pioneer



Terry Jester is Chief Executive Officer of Silicor Materials, USA. She is a 30-year veteran of the solar industry with extensive leadership experience in the manufacturing and engineering of photovoltaics. She joined Silicor Materials in 2010 following her active involvement in the company as entrepreneur in residence at Hudson Clean Energy. She has managed large solar operations and held engineering positions for SoloPower, SunPower, SolarWorld, Siemens, Arco and Shell. She holds a degree in Mechanical Engineering from California State University Northridge.

Technology Pioneer



Yobie Benjamin is Co-Founder and Chief Operating Officer of Avegant Corporation, a virtual reality and wearable technology start-up. Benjamin's experience ranges from start-ups to mega companies. Previously, Global Chief Technology Officer, Global Transaction Services, Citibank; Partner/Chief of Global Strategy, EY. He co-founded Avegant, inventors of the smart headphone. Member of the Advisory Board, Intel Capital and Sierra Ventures. Benjamin seeks to push the boundaries of computer science, design and new digital experiences. Personal projects include compliant e-currencies, payments, indigenous games, re-inventing music and search.

Technology Pioneer



Michele Guarnieri is Co-Founder and Director of HiBot Corporation, Japan. Guarnieri received his "Laurea" degree in Computer Science from the University of Verona (Italy) in 2000. He moved to Japan in 2001, working at the Tokyo Institute of Technology with the Prof. Hirose and Prof. Fukushima Laboratory. There he achieved MS and PhD degrees in Mechanical and Aerospace Engineering (2004, 2007 respectively). He was awarded a JSPS Fellowship grant for research at Tokyo Institute of Technology (2007-2009). His research interests include the development of innovative mobile platforms for search and rescue operations, motion planning and control system development. He was the "Best System Integration Award" and is a member of the IEEE Robotics and Automation Society.

Technology Pioneer

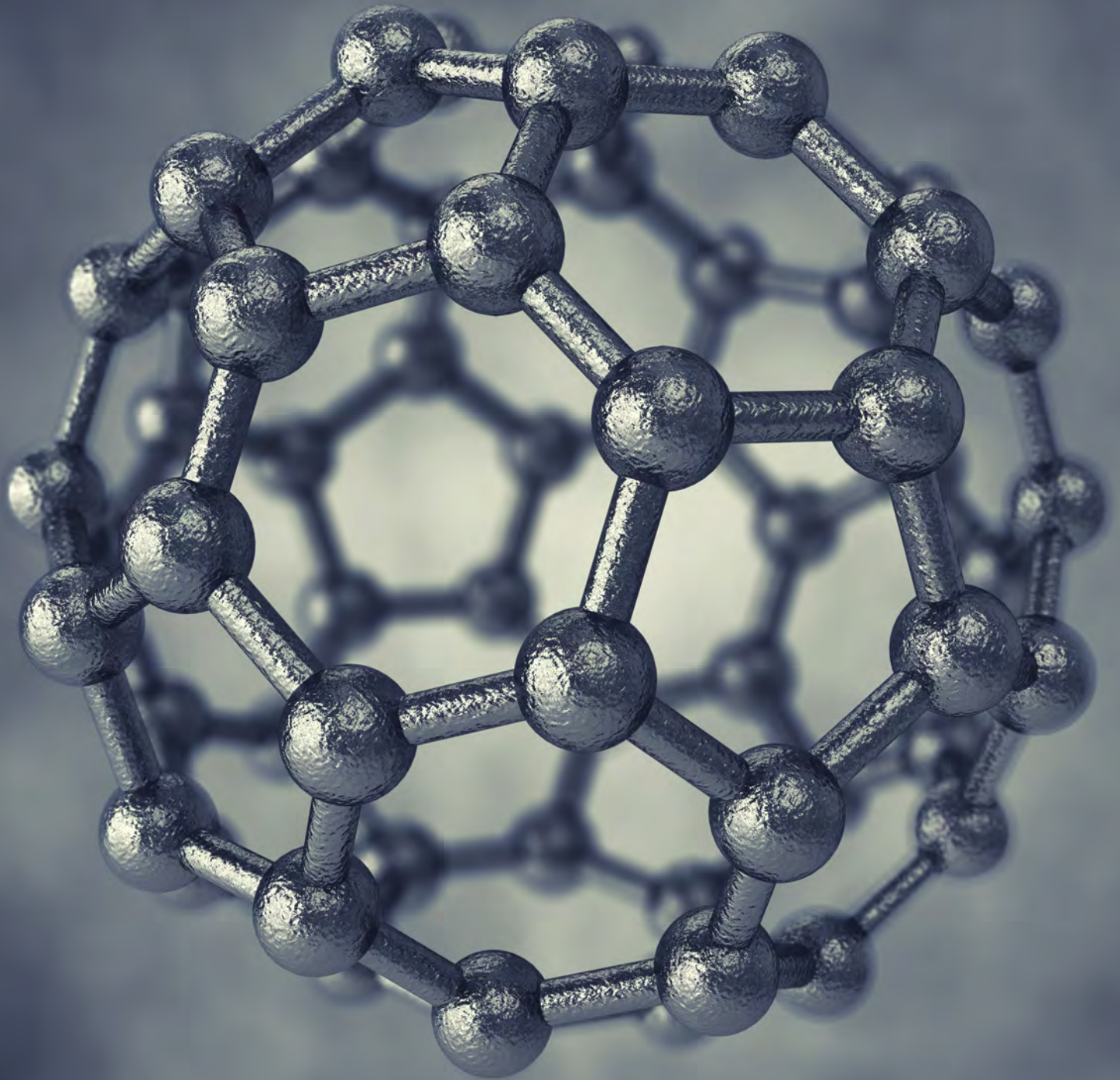


Richard Ellson is Vice-President, Research and Development; Chief Technical Officer and Co-Founder, Labcyte, USA (formerly Picoliter Inc.). Before founding Labcyte in 2000, Ellson was area manager for novel printing technologies at the Xerox Palo Alto Research Center (PARC). Prior to PARC, he held a variety of management and technical roles at the Eastman Kodak Company in the fields of color printing, image data compression, fluid handling, materials transport and net-shape manufacturing processes. His contributions to internal manufacturing processes were acknowledged by a Kodak Doctoral Award in 1988. Ellson was nominated for the 1994 Lemelson-MIT Prize and is the inventor on more than 60 US and international patents. He received the 2006 PolyPops Foundation Award from the Society for Biomolecular Sciences for his role in developing acoustic dispensing technology, the basis for the Labcyte Echo® liquid handlers. Ellson holds a B.S. in Fluid and Thermal Science and a MS in Mechanical Engineering from Case Western Reserve University. He was honored to be selected as National EY Entrepreneur Of The Year™ 2013 Life Sciences Finalist and Northern California EY Entrepreneur Of The Year™ 2013 Life Sciences Winner together with Mark Fischer-Colbrie, Labcyte President and CEO.

Technology Pioneer



Eric David is Chief Strategy Officer at Organovo. David has more than 15 years of experience in biomedical research and product development. He played a critical role in the commercial translation of 3D bioprinting as a Founder and early director of Organovo, Inc. Most recently, he was Associate Partner at McKinsey & Company, where he served private equity, pharmaceutical, biotech, diagnostic, and medical device clients to support pipeline and R&D strategy, as well as market entry strategy. Prior to McKinsey, David served as a freelance consultant to the Department of Health and Human Services in the use of genomic technologies for early detection of pathogens for public health preparedness. He completed his residency in Internal Medicine at New York Presbyterian Hospital, where he served as Assistant Chief Resident and received the Dick Bowman Award for scientific endeavor and dedication to patient care. He was also Assistant Professor at The Rogosin Institute, adjunct faculty at The Rockefeller University, and a lecturer in Medicine at Weil Cornell Medical College. He received his MD from Columbia University College of Physicians and Surgeons, his JD from Columbia University School of Law, and a BA in Physics and Fine Arts from Amherst College. He is board certified in Internal Medicine and admitted to the Bar in New York State.



2014 World Economic Forum Young Scientists

Each year the World Economic Forum recognizes outstanding researchers under the age of 40 who are pioneering new fields and leading in the pursuit of answers for global impact and the common good.

*Computational biology
and neuroscience of
learning and memory*



Panayiota Poirazi is Research Director at the Institute of Molecular Biology and Biotechnology, FORTH, Greece. Her lab develops computational methods and tools for analysing large-scale gene expression data related to human cancer in search of gene markers and disease sub-categories; identifying regulatory elements such as miRNA precursors and their targets in whole genomes of plants and mammals; building theoretical models of gene regulatory networks; and modelling healthy and degenerated brain cells and neural networks to relate learning and memory capacity with biophysical and/or morphological properties. She holds a Bachelor degree in Mathematics from the University of Cyprus, and Master and PhD in Computational Neuroscience from the University of Southern California.

*Human-computer
interaction*



Chris Harrison is Assistant Professor at the Human-Computer Interaction Institute at Carnegie Mellon University, where he investigates novel sensing technologies and interaction techniques, especially those that empower people to interact with small devices in big ways. Prior, he was CTO at Qeexo, a touchscreen technology start-up. Harrison was recently named as one of the top 30 scientists under 30 by Forbes, a top 35 innovator under 35 by the MIT Technology Review, and one of six innovators to watch by Smithsonian magazine. He is also the recipient of fellowships from Google, Microsoft Research and Qualcomm.

Optical sensors



Andrea Armani is the Fluor Early Career Chair in Engineering and Associate Professor of Chemical Engineering and Materials Science at the University of Southern California. Armani is the recipient of several awards, including the Office of Naval Research Young Investigator Award, the Presidential Early Career Award for Scientists and Engineers, and NIH Director's New Innovator Award. She has a Bachelor in Physics from the University of Chicago and a PhD in Applied Physics from the California Institute of Technology.

*Drug discovery and
science diplomacy*



Mande Holford is an Assistant Professor of Chemical Biology at Hunter College in New York. Her research combines chemistry and biology to discover, characterize and deliver novel neuropeptides from venomous marine snails as tools for manipulating cell signalling in the nervous system. She is actively involved in science education, advancing the public understanding of science and science policy. She has a scientific appointment at the American Museum of Natural History. Holford is a Member of the American Association for the Advancement of Science (AAAS), American Chemical Society, American Peptide Society and New York Academy of Sciences. She earned her PhD at Rockefeller University.

Adapting sustainable energy systems



Inês Azevedo is Associate Professor in the Department of Engineering and Public Policy at Carnegie Mellon University, and Co-Director of the Climate and Energy Decision Making Center. Her research interests lie at the intersection of environmental, technical and economic issues, such as how to address the challenge of climate change and move towards a more sustainable energy system. Azevedo is author of numerous peer-reviewed journal publications and co-author of two reports from the National Research Council. She received the Early Career Award from the Dean of the Carnegie Institute of Technology. Azevedo has a BSc in Environmental Engineering, a MSc in Engineering Policy and Management of Technology from the Technical University of Lisbon, and a PhD in Engineering and Public Policy from Carnegie Mellon University.

Modelling of material and biological mechanics



Antoine Jérusalem is an Associate Professor in the Department of Engineering Science Education at the University of Oxford, with research interests in computational mechanics of materials, large-scale parallel simulations and multi-scale cell mechanics. He is also the Founder of the International Brain Mechanics and Trauma Lab. Prior, Jérusalem was Head of the Computational Mechanics of Materials Group, a Visiting Researcher at the IMDEA Materials Institute in Spain, and Research Assistant at MIT. Jérusalem received a Diplôme d'Ingénieur from Ecole Nationale de l'Aéronautique et de l'Espace in France, and an MSc in Aeronautics and Astronautics and a PhD in Computational Mechanics of Materials from the Massachusetts Institute of Technology (MIT).

Machine vision



Michael Bronstein is an Assistant Professor at the Institute of Computational Science in the Faculty of Informatics at the University of Lugano in Switzerland. He also serves as a research scientist at Intel. Bronstein's research interests include geometric methods in computer vision, pattern recognition and computer graphics. He has worked on 3D data acquisition and processing, which was the technological core of the Israeli start-up Invision to develop a low-cost 3D sensor. Bronstein has authored over 70 publications in leading journals and conferences, over a dozen of patents and the book "Numerical geometry of non-rigid shapes". His research was recognized by numerous awards and was featured in CNN, SIAM News and Wired. Bronstein received his PhD from the Technion.

Nanotechnology and medical diagnostic devices



Wendy Dittmer is Principal Scientist of Philips Research at Royal Philips where she leads teams developing innovative new healthcare solutions helping to shape the strategic portfolio for corporate research. Her research interests include diagnostic and interventional devices, cardiology and miniaturized sensing and imaging technologies. Dittmer has a PhD in Chemistry, with a specialization in nanocrystal devices, from the University of California, Berkeley. She is a Member of the European Society of Cardiology.

Bioremediation and waste water management



Noble Banadda is Professor and Chair of the Department of Agricultural and Bio Systems Engineering at Makerere University in Uganda. He has field experience in design and operation of wastewater-activated sludge systems, anaerobic digestion of wastewaters and sludges, and bioremediation processes of soils, as well as experience in various aspects of mathematical modelling of bioprocesses, food processing engineering and biosystems. Banadda received a BSc in Food Science and Technology from the Sokoine University of Agriculture in Tanzania, an MSc in Processing Engineering and PhD in Chemical Engineering. He was also a Cochran Fellow at the Massachusetts Institute of Technology.

Stem cells, tissue engineering and 3D bioprinting



Ivana Gadjanski is an Assistant Professor at Belgrade Metropolitan University, with research interests in the field of stem cells and tissue engineering. She is the Founder of Pubsonic, a biomedical search engine start-up, and the Fab initiative, a non-profit that supports entrepreneurship in the STEAM field in Serbia and the Western Balkans. She also established Serbia's first Fab Lab, a workshop for rapid prototyping and a 3D bioprinting facility at the R&D Center for Bioengineering. Gadjanski has been a Fulbright and TED Fellow and a Member of the Global Young Academy. She earned a PhD in Neuroscience in Germany.

Cognitive neuroscience and the study of consciousness



Morten Overgaard is Professor in Cognitive Neuroscience at the Institute of Clinical Medicine, University of Aarhus, Denmark. A leader of many large-scale European research projects, he studies the relationship between conscious experience and brain processes from a combined experimental, philosophical and neurorehabilitation perspective. Overgaard is a pioneer in translational neuroscience, investigating how subjective consciousness relates to behavioural measures and brain processes. His research is guided by the integration between humanities/philosophy of mind and neuroscience; and between clinical work (neurorehabilitation and psychiatry) and basic research. He works on theories of the brain that include subjective experience. Overgaard holds an MA in Psychology from the University of Copenhagen and a PhD from Aarhus University.

Neurological origins of the embodied self



Aikaterini Fotopoulou is Senior Lecturer, Psychoanalysis Unit at the University College London (UCL). Fotopoulou heads a research lab that focuses on the relationship between brain, body and mind. She is also Director of the London Neuropsychology Fund, a registered charity. Fotopoulou is a recipient of the Elizabeth Warrington Early Career Prize from the British Neuropsychological Society. She studied neuropsychology and psychoanalysis, and holds a PhD in Cognitive Neuroscience from the University of Durham.

CRISPR tool for editing DNA



Feng Zhang is a Core Member of the Broad Institute of MIT and Harvard, where he is revolutionizing the fields of genomics and neuroscience. Zhang has developed a technique for editing DNA called CRISPR. This tool allows researchers to identify a corrupted segment in a sequence of DNA that leads to disease so that it may be deleted or replaced by other genetic material. Although his main focus is the molecular machinery of brain cells, the potential applications of this technology extend well beyond neuroscience. With these tools, researchers can deepen their understanding of how the genome works, examining the failures that lead to disease. He is recipient of the Perl/UNC Prize in Neuroscience, the NIH Director's Pioneer award and the National Science Foundation's Alan T. Waterman award. He has also received technology innovation awards from the McKnight and Damon Runyon foundations, and the International Society for Transgenic Technologies.

Soft and flexible interfaces and electronic skins



Stéphanie P. Lacour is an Assistant Professor at the School of Engineering at the Ecole Polytechnique Fédérale de Lausanne, in Switzerland. She pioneered the development of stretchable electronics, demonstrating elastic metallization and the first stretchable electronic circuit. Lacour was named one of the "Top 35 Innovators under the age of 35" by the MIT Technology Review in 2006. She was also awarded a University Research Fellowship from the Royal Society in 2007 and the Zonta Award in 2011 for her research achievement as a young female academic. Lacour is the recipient of an ERC starting grant entitled Electronic Skins, aiming at defining the foundations of a prosthetic skin that restores natural touch sensations for patients wearing an artificial hand. She is also a 2012 Volume Organizer for the MRS Bulletin and organizes, since 2006, a symposium on soft electronics and neural interfaces at international MRS meetings. Lacour received her PhD in Electrical Engineering from INSA de Lyon in France, and completed postdoctoral research at Princeton University and the University of Cambridge.

Quantifying water use



Maite Martínez Aldaya is a Research Associate with the Botin Foundation and Water Footprint Network's Water Observatory in Spain. She has worked on water management, consumption, production and trade issues at the European Commission, United Nations, University of Twente, Public University of Navarra, Complutense University and Technical University of Madrid. She has also worked as a consultant to the United Nations Environment Programme (UNEP). Martínez Aldaya is a Member of the Young Global Academy. She received an MSc in Environmental Policy and a PhD in Ecology from the London School of Economics.

New material science



Michelle Moram is a materials physicist working on new technologies for water treatment and sustainable energy generation in the developing world. She is currently a Lecturer in Energy Materials in the Faculty of Engineering, Department of Materials, at Imperial College London. Prior to joining Imperial, she spent five years developing III-nitride semiconductors as an independent Oppenheimer Research Fellow and Jesus College Research Fellow at the Departments of Materials Science and Physics at the University of Cambridge. Moram is a Royal Society University Research Fellow at Imperial College London and a recipient of numerous honours, including the Leverhulme Research Leadership award, the IOM3 Silver Medal and the BACG Young Scientist of the Year award. She received her PhD from the University of Cambridge.

Science policy and cellular biology



Vanny Narita is a government-led Innovation Program Specialist at the National Innovation Committee of the Republic of Indonesia. She is also a Researcher at the Agency of the Advancement and Application of Technology. Her research focuses on valuable recombinant protein expression, working closely with industries within Indonesia's Vaccine and Medicine Consortium. Narita is the National Contact Point for Health for Horizon 2020-EU. She is a Member of the Global Young Academy.

Drug discovery and regulatory policy



Vidushi Neergheen-Bhujun is a Senior Lecturer at the University of Mauritius, specializing in applied biochemistry and pharmacognosy. This includes basic research and clinical trials to determine health-promoting and disease management potential of traditional herbal, endemic medicinal and food plants against several non-communicable diseases. She is also interested in assisting the development of national policies and programmes for the regulation of herbal medicine and functional food in Mauritius. Neergheen-Bhujun is a Member of the Global Young Academy, with executive positions in 2012 and 2013. She also leads the secretariat of the Society for Free Radical Research Africa. Neergheen-Bhujun has a PhD in Biosciences from the University of Mauritius.

Mathematical statistics applied to the natural sciences



Victor M. Panaretos is Associate Professor of Mathematical Statistics at Ecole Polytechnique Fédérale de Lausanne (EPFL) in Switzerland, where he leads a group of eight researchers developing mathematical statistics for complex data structures. At the age of 24, he became the youngest faculty member ever to hold a chaired professorship at EPFL and then one of the youngest ever ERC Starting Grant Awardees. Panaretos is the recipient of the Erich Lehmann Award for an Outstanding Doctoral Thesis in Theoretical Statistics. He has a PhD from the University of California, Berkeley.

Applied mathematics and biostatistics for public health



Roger Peng is Associate Professor of Biostatistics at the Johns Hopkins Bloomberg School of Public Health in the US. His main research interest focuses on developing and applying novel statistical methods to assessing the health impacts of environmental pollutants. Peng is Co-Founder of the Johns Hopkins Data Science Specialization offered through Coursera. He has a BSc in Applied Mathematics from Yale University and a PhD in Statistics from UCLA.

New materials science and energy storage systems



Jennifer Rupp is Head of the Department of Materials at ETH Zurich in Switzerland. Her main research interests are on materials development and structure-transport relations for information memory storage, microsystems and energy conversion and storage systems. This includes new device design concepts and performance testing. Rupp is an elected member of the European Academy of Science for Chemistry and on the editorial board of the Journal of Electroceramics. She is the winner of the Spark Award 2014 by ETH Zurich for the most innovative and economically important invention of the year for a new memristor information storage concept. Rupp studied mineralogy and crystallography at the University of Vienna in Austria and received her PhD in Material Science from ETH Zurich.

Radio astronomy and cosmic magnetic fields



Anna Scaife is a Reader at the School of Physics and Astronomy at the University of Southampton in the United Kingdom. Her research includes pioneering work in the study of galaxy stability and evolution through radio astronomy which allows for the observation of cosmic-ray electrons and magnetic fields invisible to optical telescopes. Her research is laying the ground work for understanding how cosmic magnetic fields are generated and for experiments planned for the Square Kilometre Array.

Superconductors



Suchitra Sebastian is an Associate Professor in the Department of Physics at the University of Cambridge. Her research interests are in the area of correlated electron systems, particularly in novel materials. Sebastian is the recipient of numerous awards, including the: Junior Research Fellowship, Trinity College, Cambridge University (2006); Lee Osheroff Richardson North American Science prize (2007); Young Scientist Medal in Magnetism, International Union of Pure and Applied Physics (2012); Moseley Medal, Institute of Physics (2012); Women in Science Fellowship to develop the next generation of superconductors, L'Oreal-UNESCO (2013); and a five-year European Research Council starting grant (2014). Sebastian earned an MSc and PhD in Applied Physics from Stanford University in the US, and an MBA from the Indian Institute of Management in India.

Graphene quantum electromechanical systems



Christoph Stampfer is a Professor in the Department of Physics and Head of the Second Institute of Physics A at RWTH Aachen University in Germany. His research interests include the fields of microelectronics and nanotechnology, with a particular focus on carbon based microelectronics. Stampfer has authored and co-authored more than 100 papers for Nature Physics, Nano Letters, Physical Review Letters and Applied Physics Letters, among others. He is the recipient of an ERC Starting Grant to work on graphene quantum electromechanical systems. Stampfer earned a BSc in Applied Physics from the University of Edinburgh and a PhD from the ETH Zürich in Switzerland.

Human-computer interaction



Sriram Subramanian is a Professor of Human-Computer Interaction in the Computer Science Department at the University of Bristol in the United Kingdom. His research focuses on expanding the possibilities of user experiences when interacting with computer-mediated environments through the use of haptics, visual and smell modalities. Subramanian is also Co-Founder of Ultrahaptics, which brings back the sense of (tactile) touch to touchless interfaces, creating the experience of feeling without touching. Prior, he was a Senior Scientist at Philips Research Eindhoven in the Netherlands. Subramanian has an undergraduate degree in physics, an MA in Electrical Communication Engineering and a PhD in Industrial Design.

Medical nanotechnology



Peter Tessier is an Associate Professor of Chemical & Biological Engineering at Rensselaer Polytechnic Institute (RPI) in the US. His research interests focus on designing and optimizing a class of large therapeutic proteins (antibodies) that hold great potential for treating human disorders ranging from cancer to Alzheimer's disease. Tessier is the recipient of a number of research awards, including a Humboldt Fellowship for Experienced Researchers, the Pew Scholar Award in Biomedical Sciences and the National Science Foundation CAREER Award.

Self-assembly of DNA



Yin Peng is an Assistant Professor in Systems Biology at Harvard Medical School and a Faculty Member of the Wyss Institute for Biologically Inspired Engineering at Harvard University. His research interests lie at the interface of information science, molecular engineering and biology. His current focus is to engineer information directed self-assembly of nucleic acid (DNA/RNA) structures and devices, and to exploit such systems to do useful molecular work. Yin is the recipient of several awards, including: NIH Director's New Innovator Award (2010); NSF CAREER Award (2011); DARPA Young Faculty Award (2011); ONR Young Investigator Program Award (2011); NIH Director's Transformative Research Award (2013); NSF Expedition in Computing Award (2013); and ACS Synthetic Biology Young Scientist Award (2014).

Applied mathematics



Erez Aiden is an Assistant Professor in the Department of Genetics at the Baylor College of Medicine, where he directs the Center for Genome Architecture, and in the Department of Computer Science and Computational and Applied Mathematics at Rice University. His research has made fundamental contributions to a large variety of disciplines, including molecular biology, polymer physics, historical linguistics, wearable computing, and mathematics. These include: development of a three-dimensional genome sequencing method; discovery of dynamic reorganization of the genomic architecture to facilitate gene expression or silencing; the characterization of the genome as a “fractal globule;” quantitative analysis of the evolutionary dynamics of language which led to the discovery that the rate of verb regularization depends on the inverse-square of its usage frequency. He has over 20 patents in various stages of filing. Co-inventors include Bob Langer, Nathan Myhrvold and Bill Gates.

*Pollinator health and
pollination services*



Nigel Raine is Researcher in Ecology, Evolution and Behavior, School of Biological Sciences, Royal Holloway, University of London. Understanding and ameliorating the causes of global bee declines has important consequences for the pollination of food crops and wild flowers. Our reliance on agricultural chemicals (e.g. pesticides) to boost crop quality and yield is one environmental stressor that could have a significant detrimental impact on both wild and managed bees. Pesticides act on insects by disrupting the normal flow of information through the nervous system, so even when applied at levels that are not fatal it is likely that they could affect behaviour. His research aims to answer how field relevant exposure to multiple pesticides affects the behaviour of individual bees and consequently colony function in social species.

*Game design for social
progress*



Jessica Hammer is Assistant Professor at Carnegie Mellon University, jointly appointed between the Human-Computer Interaction Institute and the Entertainment Technology Center. She studies how games can change the way people think, feel and behave. Other research interests include creativity, gender, mobile technologies and community design. She earned a PhD in Cognitive Studies in Education at Columbia University.

Science Decoders and Communicators

Leaders in academic publications and science journalism who are crucial in enabling understanding of the relevance and impacts of major science research and breakthroughs

The New England Journal of Medicine



Jeffrey M. Drazen joined the *New England Journal of Medicine* as Editor-in-Chief in 2000. Drazen's responsibilities include oversight of all editorial content and policies. He served as an Associate Editor and Editorial Board Member for the *Journal of Clinical Investigation*, the *American Journal of Respiratory Cell and Molecular Biology* and the *American Journal of Medicine*. A specialist in pulmonology, Drazen maintains an active research programme. He has published more than 300 articles on topics such as lung physiology and the mechanisms involved in asthma. In 1999, he delivered the Amberson Lecture, the major research address at the annual meeting of the American Thoracic Society. In 2000, he received the Chadwick Medal from the Massachusetts Thoracic Society for his contributions to the study of lung disease.

Scientific American



Mariette DiChristina oversees *Scientific American*, *ScientificAmerican.com*, *Scientific American Mind* and all newsstand special editions. She is the first woman to assume the top post in *Scientific American's* 166-year history. Under her leadership, the magazine received a 2011 National Magazine Award for General Excellence. She is an adviser for the Citizen Science Alliance; was named an AAAS Fellow in 2011; and was President (in 2009 and 2010) of the 2,500-member National Association of Science Writers. She was an Adjunct Professor in the graduate Science, Health and Environmental Reporting programme at New York University for several years. DiChristina is a frequent lecturer and has appeared at the New York Academy of Sciences, California Academy of Sciences, Yale University and New York University, among others. She is the recipient of many awards.

National Public Radio (NPR)



Joe Palca is a science correspondent for NPR. Since joining NPR in 1992, Palca has covered a range of science topics — everything from biomedical research to astronomy. Palca was formerly Washington news editor for *Nature*, and a senior correspondent for *Science Magazine*. Palca's journalism and science writing has won numerous awards, including the National Academies Communications Award, the Science-in-Society Award of the National Association of Science Writers, the American Chemical Society James T. Grady-James H. Stack Award for Interpreting Chemistry for the Public, the American Association for the Advancement of Science Journalism Prize, and the Victor Cohn Prize for Excellence in Medical Writing. Palca holds a Ph.D. in psychology from the University of California at Santa Cruz where he worked on human sleep physiology.

Nature Publishing Group



Ed Gerstner is the Executive Editor, China, for Nature Communications. Gerstner joined Nature Publishing Group in 2002 as Editor of the Nature Physics Portal and NPG Materials Update, and subsequently became an Associate and then Senior Editor for *Nature* and *Nature Materials* and *Nature Physics*. In these various positions, Gerstner handled a broad range of physical science manuscripts. He is committed to the dissemination of scientific knowledge and increasing the public understanding of science and technology, and an Open Access advocate.

The Journal of the Norwegian Medical Association



Charlotte Haug is the Editor-in-Chief of the *Journal of the Norwegian Medical Association*, the only peer-reviewed general medical journal in Norway. She has been a Member of International Committee of Medical Journal Editors since 2002 and a Council Member of the Committee on Publication Ethics since 2005. She holds an MD and a PhD in Infectious Diseases and Immunology from the University of Oslo. After a decade working in clinical medicine and research at the National Hospital, she focused on priority setting and supervision of healthcare systems in Norway and globally, working for the National Board of Health and the Department of Health. She was Head of the section for specialized healthcare at the Norwegian National Board of Health, and supervised health policy research at SINTEF Unimed, largest independent research organization in Scandinavia. Her research concentrated on international comparative studies of healthcare systems.

Scientific American



Fred Guterl is the Executive Editor of Scientific American, and an award-winning journalist. In this position, he led the magazine to its first ASME Award for General Excellence. He has been with the magazine since 2010. Previously, he spent 10 years with Newsweek International, including as Deputy Editor. He is the author of *The Fate of the Species*.

Nature Publishing Group



Nick Campbell is the Executive Editor of Nature and oversees its partnerships and supplements. Campbell holds a PhD in evolutionary and population genetics from Southern Cross University in Australia. His postdoctoral research was in Steve Barker's group at the Institute for Molecular Bioscience and School of Molecular and Microbial Sciences at the University of Queensland. He spent a decade as a research geneticist before joining the Nature Publishing Group, where he has held a variety of editorial positions since 2001.

Nautilus



Michael Segal is Editor-in-Chief of Nautilus, an online science and culture magazine. He was formerly Senior Editor, Nature Nanotechnology. Michael has published papers on astrophysics, plastic electronics, oil drilling, and the history of science. He holds a Doctorate in Electrical Engineering from MIT.

GeekPark

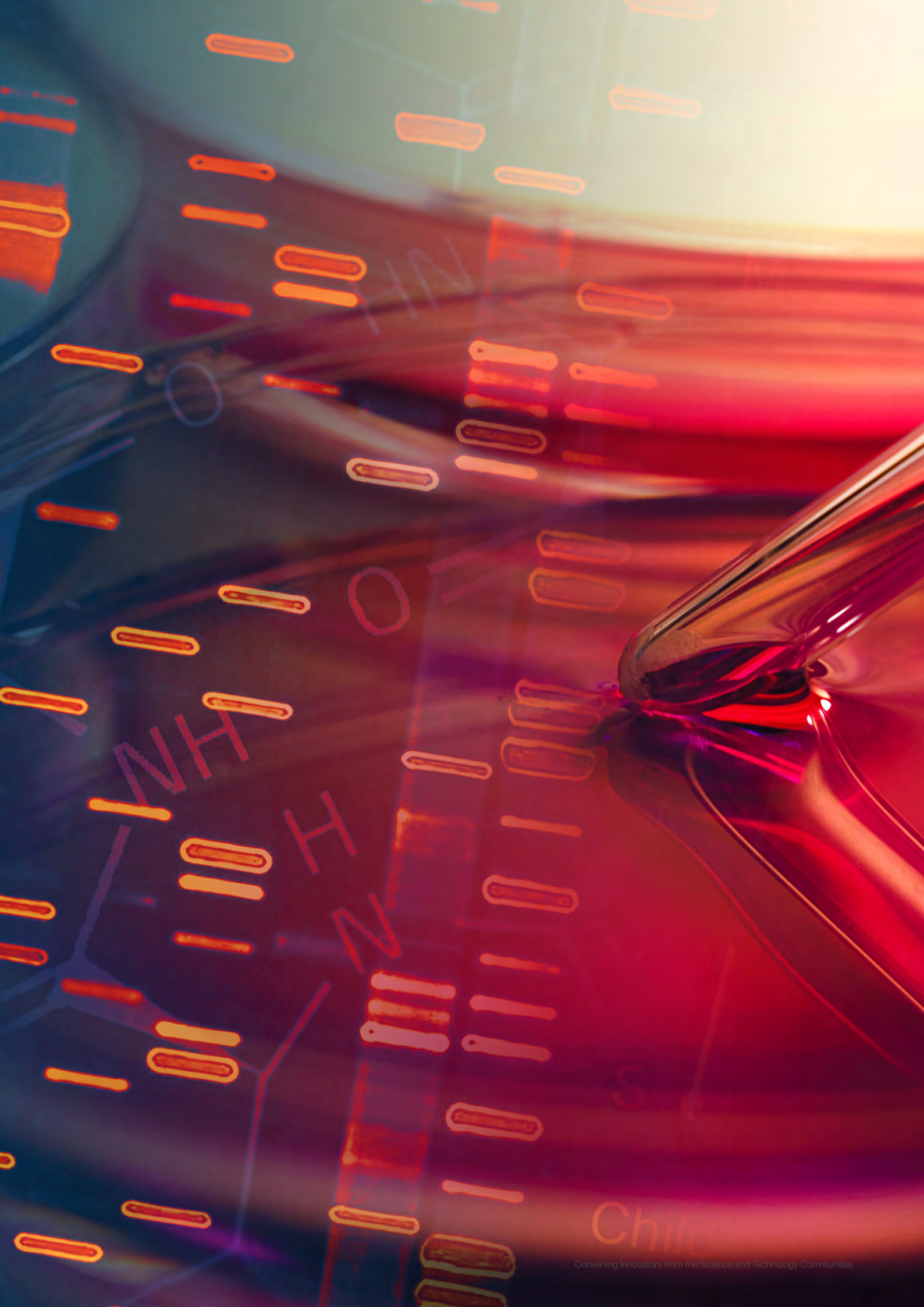


Zhang Peng is the Founder & Editor in Chief of GeekPark, the first organization that brought the concept geek to China, and provides the geeks/innovators with online community and offline activities. He has made series studies of the development course of famous IT companies, including Microsoft, Apple, Baidu, and Sina. During the past decade, Zhang has contributed his research and understanding of Internet companies, especially his focused research of Internet innovation products, to many other companies and organizations as guest consultant and lecturer.

National Geographic Magazine



David Lindsey is Deputy Editor, News and Features, at National Geographic Magazine and nationalgeographic.com where he guides National Geographic's coverage of exploration, geography, archaeology, natural science, and environmental and historical conservation. Formerly, Editor, Reuters, USA Today and The Washington Post.



2014 World Economic Forum Future Scientists

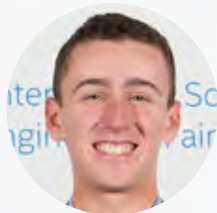
The World Economic Forum has recognized four finalists of the 2014 Intel International Science and Engineering Fair (ISEF) - the world's largest high school science fair - for outstanding research in the global public interest. They are invited by the Forum to participate in the 2014 Annual Meeting of New Champions.

Bioremediation



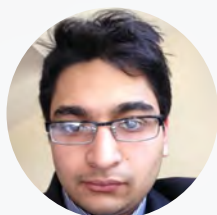
Nivatha Balendra is a researcher at the INRS–Institut Armand-Frappier Research Centre and the McGill University and Génome Québec Innovation Centre in Canada, specializing in the oil-ingesting capacity of bacteria. Through her research, she found a strain of *Pseudomonas fluorescens*, which is used in biocontrol efforts along the St Lawrence River. This discovery was the basis of a science project voted a finalist at the Intel International Science and Engineering Fair (ISEF) and for which Balendra received the World Economic Forum Future Scientist Award. She is a graduate in health sciences from Montreal's Marianopolis College.

Computer science/ Algorithms for cancer diagnosis



Joshua Michael Zweig is a student scholar in the United States and a degree candidate at Columbia University. He has received the World Economic Forum Future Scientist Award, was a semi-finalist in the Intel Science Talent Search (2014) and an Intel International Science and Engineering Fair finalist (2013 and 2014). For his project, Diagnosis of Abnormalities in 3-Dimensional Mammograms via an Artificial Neural Network, Zweig wrote an algorithm that correctly diagnoses breast cancer from digital mammogram images. This approach, which can be deployed as a web-based service, resulted in 94% of mammograms being correctly diagnosed.

Applied mathematics/ Neuroscience



Archis Bhandarkar is an undergraduate student at the Massachusetts Institute of Technology (MIT), pursuing a double major in biological engineering and brain and cognitive sciences. Bhandarkar has performed cutting-edge research in computational neuroscience resulting in being voted a two-time finalist at the Intel International Science and Engineering Fair (ISEF). At the 2014 ISEF, he was presented with the World Economic Forum Future Scientist Award for his project, On the Unique Roles of Neurocomputational States in Neocortical Circuits, which explores how information flows in the brain between different types of neurons. Mathematical insights discovered in this work can be used to explain neocortical functional losses in neurological disorders such as schizophrenia and autism, and to better engineer circuits, which harness the power of biological neuron-based computing.



Gi Na Lee is a student at the Korean Minjok Leadership Academy, focusing on research and policy in the fields of biotechnology and environment. She is the winner of numerous awards and honours, including the Korean Minister of Environment's Award for an essay competition, a silver award in the Dasan Research Competition, gold medals in the engineering division and environment division at the Korea Science and Engineering Fair, a First Life Science Award from Sigma Xi, and a second place award from the American Society for Microbiology. Lee also won the inaugural World Economic Forum Future Scientists Award at the 2014 Intel International Science and Engineering Fair.



Related Reading

Many economies are looking to science and technology to boost their productivity, competitiveness and resilience. World Economic Forum publications provide the science community with opportunities to voice their views to global audiences by contributing to our annual benchmarking studies, topical reports on emerging technologies and the application of science, or through our social media networks. Some of the latest publications include:

Top 10 Emerging Technologies 2014

The Forum's Global Agenda Council on Emerging Technologies identifies key trends in technological change in this annual list. By highlighting the most important technological breakthroughs, the Council aims to raise awareness of their potential and contribute to closing gaps in investment, regulation and public understanding.

<http://wef.ch/etech14b>

Entrepreneurial Ecosystems around the Globe and Early-Stage Company Growth Dynamics

The World Economic Forum, in collaboration with Stanford University, Ernst & Young and Endeavor, surveyed over 1,000 entrepreneurs from around the world to better understand how successful entrepreneurial companies speed access to new markets and become scalable, high-growth businesses.

<http://www.weforum.org/reports/entrepreneurial-ecosystems-around-globe-and-early-stage-company-growth-dynamics>

Bringing Space Down to Earth

The Forum's Global Agenda Council on Space Security clearly explains how space-based technologies and services are crucial to face society's greatest challenges. In a straightforward manner, the Council aims to inform readers about a wide range of opportunities they may not have known were possible.

<http://wef.ch/spacepreview>

The **Global Risks Report** identifies threats to world security, from the breakdown of critical information infrastructure and antibiotic-resistant bacteria to food crises and nuclear weapons proliferation. It offers a tool to understand these risks and identify interconnections between them.

<http://wef.ch/risks>

The **Global Competitiveness Report** assesses the competitiveness landscape of 148 economies, providing insight into the drivers of their productivity and prosperity. The report series remains the most comprehensive assessment of national competitiveness worldwide.

<http://wef.ch/gcom>

The **Global Gender Gap Report** captures the magnitude and scope of gender-based disparities around the world. Its index benchmarks gender gaps on economic, political, education- and health-based criteria and provides country rankings for comparison across regions and income groups over time.

<http://wef.ch/gender>



COMMITTED TO
IMPROVING THE STATE
OF THE WORLD

The World Economic Forum is an international institution committed to improving the state of the world through public-private cooperation in the spirit of global citizenship. It engages with business, political, academic and other leaders of society to shape global, regional and industry agendas.

Incorporated as a not-for-profit foundation in 1971 and headquartered in Geneva, Switzerland, the Forum is independent, impartial and not tied to any interests. It cooperates closely with all leading international organizations.

World Economic Forum
91–93 route de la Capite
CH-1223 Cologny/Geneva
Switzerland

Tel.: +41 (0) 22 869 1212
Fax: +41 (0) 22 786 2744

contact@weforum.org
www.weforum.org