FALLING
WALLS
FOUNDATION

Falling Walls announces Science Breakthroughs of the Year 2021

Berlin, 15 September 2021. Today the first Science Breakthroughs of the Year Awards are announced by the Falling Walls Foundation in Berlin. The Science Breakthroughs are awarded in 10 categories, the first seven recipients ranging from Life Sciences and Physical Sciences to Art and Science and Science and Innovation Management.

The first laureates of the prestigious "Science Breakthrough of the Year" award are:

José-Alain Sahel, University of Pittsburgh School of Medicine I Life Sciences
Breaking the Wall to Restoring Vision for Retinal Degeneration

Elham Fadaly and Erik Bakkers, Eindhoven University of Technology I Physical Sciences
Breaking the Wall to Light-Emitting Silicon

Francesca Santoro, Instituto Italiano di Tecnologia I Engineering and Technology
Breaking the Wall to Biohybrid Synapses

Dilip Menon, University of Witwatersrand I Social Sciences and Humanities
Breaking the Wall to a Paracolonial Paradigm

Gerhard Widmer, Johannes Kepler University Linz I Art and Science
Breaking the Wall to Computational Expressivity in Music Performance

George Cowell, Rising Academy Network I Future Learning
Breaking the Wall to AI-powered Personalised Learning for All

Gisbert Schneider, ETH Zurich I Science and Innovation Management
Breaking the Wall of Slow and Inefficient Drug Discovery

Over 1.000 nominations from 115 countries were reviewed by the jury chaired by Helga Nowotny, Former President of the European Research Council. The breakthroughs will be presented during the Falling Walls Science Summit on November 9 in Berlin, the anniversary of the Fall of the Berlin Wall. Free livestream of the event will be available on www.falling-walls.com.

"The jury was thrilled by the excellent research that lay at the foundation of each project and the commitment of research institutions around the world to continue looking for solutions that serve humanity" – comments Helga Nowotny, Jury Chair and Former President of the European Research Council.

As Jürgen Mlynek, the Chairman of the Falling Walls Foundation, adds: "The number of participating institutions and countries is growing each year. This is a positive trend that shows that the Falling Walls Science Summit makes an important contribution to the international scientific community and brings the best research on stage in Berlin ".

The Science Breakthroughs of the Year in categories Science Engagement (Falling Walls Engage), Science Start-Ups (Falling Walls Venture) and Science Innovators (Falling Walls Lab) will be announced after shortlist live pitches during the Falling Walls Science Summit. Breakthroughs in alle ten categories will present their work on 9 November, the anniversary of the peaceful Fall of the Berlin Wall.

ABOUT THE FALLING WALLS SCIENCE SUMMIT

Falling Walls Science Summit is a leading international, interdisciplinary and intersectoral forum for scientific breakthroughs and science dialogue between global science leaders and society. The event takes place every year from 7–9 November in Berlin, commemorating the fall of the Berlin Wall. With formats Falling Walls Pitches (7 Nov), Falling Walls Circle (8 Nov) and

Falling Walls Science Breakthroughs of the Year (9 Nov), the Falling Walls Science Summit is the leading forum for global science leaders from academia, business, politics, the media, and civil society to debate the potential of scientific breakthroughs to solve grand challenges and shape a sustainable future. The Falling Walls Science Summit is organized by the charitable Falling Walls Foundation. More: www.falling-walls.com
Press contact: Lena Taran, press@falling-walls.com, +49 30 60 988 39-750

SCIENCE BREAKTHROUGHS OF THE YEAR 2021

LIFE SCIENCES
JOSÉ-ALAIN SAHEL - UNIVERSITY OF PITTSBURGH SCHOOL OF MEDICINE
Breaking the Walls to Restoring Vision for Retinal Degeneration
José-Alain Sahel conceived the first-in-man clinical trial combining a biotherapy with a stimulation device to observe the first clinical evidence for vision restoration using optogenetics. Dr. Sahel and his team supervised the clinical development of a wireless photovoltaic retinal prosthesis successfully used in trials of Leber Hereditary Optic Neuropathy, a blinding neurodegenerative disease. Phase III studies of the new therapeutical approach are completed in the US and Europe with promising results.

PHYSICAL SCIENCES
ELHAM FADALY AND ERIK BAKKERS - EINDHOVEN UNIVERSITY OF TECHNOLOGY
Breaking the Wall to Light-Emitting Silicon
Elham Fadaly and Erik Bakkers created photonic chips with a new alloy of hexagonal silicon that can revolutionise computing speed and performance. Compared to currently used copper transmitters, the novel optoelectronics technology could provide a faster and more energy efficient way to transfer data between computer chips.

ENGINEERING AND TECHNOLOGY
FRANCESCA SANTORO - ISTITUTO ITALIANO DI TECNOLOGIA
Breaking the Wall to Biohybrid Synapses
Francesca Santoro developed adaptive biohybrid synapses that can be used for implantable neuroprosthetics. The artificial synapses combine a biological interface with an electronic platform, which mimic the behavior of synapses within the human nervous system. The discovery may help in successful therapy against neurodegenerative diseases like Alzheimer's.

SOCIAL SCIENCES AND HUMANITIES
DILIP MENON - UNIVERSITY OF WITWATERSRAND
Breaking the Wall to a Paracolonial Paradigm
Dilip Menon presented a new interdisciplinary paracolonial approach to re-think the history of the Global South. His work analyses the connected histories of Asia, Africa, Latin America, and the Caribbean aside from the common perspective of Postcolonialism and the nation state. Central to the theory of Professor Melon is the concept of archipelagic relation based on the affinity between non-contiguous spaces.

ART AND SCIENCE
GERHARD WIDMER - JOHANNES KEPLER UNIVERSITY LINZ
Breaking the Wall to Computational Expressivity in Music Performance
Gerhard Widmer demonstrated the first naturally expressive musical co-performance between a human and a computer, based on learned computational models of expressivity. This automatic computer piano companion is an outcome of long-term scientific research on expressivity in music using AI and computational methods, conducted in the context of his ERC project "Con Espressione". The computer's performance is based on principles it discovered itself, learning from a unique data source: Chopin's complete solo piano works as played on a computer-monitored grand piano by the famous Russian pianist Nikita Magaloff.

FUTURE LEARNING
GEORGE COWELL - RISING ACADEMY NETWORK
Breaking the Wall to AI-powered Personalised Learning for All
George Cowell created "Rori", a chatbot tutor harnessing AI and audio to deliver personalised learning and combat illiteracy among school children from developing countries. The application includes a 20-week programme of ready-to-air radio scripts and SMS content of school curriculum and offers literacy and numeracy education content for five different age groups.

SCIENCE AND INNOVATION MANAGEMENT
GISBERT SCHNEIDER - ETH ZURICH
Breaking the Wall of Slow and Inefficient Drug Discovery
Gisbert Schneider developed a concept for integrating constructive artificial intelligence into the pharmaceutical drug discovery process. To make otherwise costly and long process of drug discovery more efficient, the project transfers decision making from scientists to an AI machine, which can generate biologically validated molecules. Thus, drug discovery can become more rationalized and lets the AI technology "invent" the needed molecules from scratch.