



NATIONAL RESEARCH FOUNDATION
PRIME MINISTER'S OFFICE
SINGAPORE



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Global Young Scientists Summit marks a decade of nurturing young scientists worldwide

SINGAPORE: With topics ranging from start-up opportunities for young scientists to preparing for the next pandemic, the **Global Young Scientists Summit (GYSS)** returns from January 17 to 21, 2022, with an exciting array of plenary lectures and panel discussions by eminent scientists spanning the fields of science, mathematics, and technology.

Over five days, 21 eminent scientists and Nobel Laureates will converge at the GYSS 2022 and engage over 800 young researchers from 40 countries.

Speakers include the most recent Nobel Laureate in Chemistry (2021), **Prof Benjamin List**, who was awarded for his work that explores how chemical catalysis can enable science and technology to advance humankind. The event will also host top engineering minds such as **Prof Jayant Baliga**, recipient of the 2014 IEEE Medal of Honour, whose research in power semiconductor devices is pushing the boundaries of electronics.

Other speakers include **Prof Robert Langer** (2008 Millennium Technology Prize), co-founder of Moderna and one of the most cited engineers in the world; **Prof Thomas Südhof** (2013 Nobel Prize in Physiology/Medicine), whose research and pharmaceutical startup will improve the lives of those suffering from schizophrenia; and **Prof Ada Yonath** (2009 Nobel Prize in Chemistry), whose breakthrough research has demonstrable potential to create new antibiotics.

The GYSS 2022 marks a key milestone for the annual event as it celebrates its 10th anniversary. It will be launched by Deputy Prime Minister and Coordinating Minister for Economic Policies and Chairman of the National Research Foundation, **Mr Heng Swee Keat**, who will also deliver a speech. To commemorate the occasion, former President of Singapore, **Dr Tony Tan**, who conceived of the GYSS and is its patron, will deliver short remarks and receive a special anniversary publication that showcases the summit's 10-year history and achievements.

Organised by the National Research Foundation, Singapore (NRF), the GYSS started in 2013 as a way to excite and engage young researchers, and encourage them to pursue their scientific dreams through close interactions with distinguished scientists and peers.

NRF Chief Executive Officer Prof Low Teck Seng said, "The GYSS continues to be an excellent platform for aspiring researchers to interact with some of the world's leading minds. These interactions spark curiosity and nurture scientific interests, which instil aspiring researchers with the passion and aptitude for higher levels of scientific inquiry – a key hallmark of research excellence.

“I am delighted that for over a decade, the GYSS has been a global beacon that inspires next-generation scientific leaders, and supports the growth of science, technology, and innovation, through meaningful engagements, discussions, and collaborations.”

A stellar line-up of speakers

Due to the COVID-19 pandemic, the GYSS 2022 will be held online, with 20 plenary lectures and six panel discussions broadcast live on the NRF YouTube channel. There will also be virtual networking sessions and, for the first time, 19 selected young scientists will share their research work with their peers.

The slate of 21 speakers includes winners of the Nobel Prize, Fields Medal, Millennium Technology Prize, Turing Award, and IEEE Medal of Honour. Four of the speakers are new to the event: Professor Benjamin List – Nobel Prize in Chemistry, 2021, Professor Barry Marshall – Nobel Prize in Physiology or Medicine 2005, Professor Stefan Hell – Nobel Prize in Chemistry, 2014, and Professor B. Jayant Baliga – IEEE Medal of Honour, 2014.

There are also physicists who are changing our understanding of the earth and our role in the universe, such as **Prof Didier Queloz**, who is researching ‘55 *Cancer* e’, an exoplanet covered in an ocean of lava that is similar to Earth when it was first formed; and **Sir Andre Geim** and **Sir Konstantin Novoselov** whose discovery of graphene is changing the world of material science by enabling the development of two-dimensional materials.

Among the speakers too are mathematicians and technologists, like **Prof Stuart Parkin**, whose studies of spintronics has greatly impacted how data is stored; **Prof Alessio Figalli**, whose proof of the Optimal Transport theory is helping in the storage and organisation of images; and **Prof Leslie Valiant** who is exploring how humans memorise, so that machines or artificial intelligence (AI) can learn to do the same.

The plenary lectures and panel discussions will also include topics such as the next generation power grids, ethics and governance in artificial intelligence, preparing for the next pandemic, the convergence of neuroscience and computer science, and whether scientific research has fundamentally changed.

Commemorating a decade of excellence

To commemorate the 10th anniversary of GYSS, a special **commemorative publication** titled “**Where Great Minds Meet: 10 Years of the Global Young Scientists Summit**”, will be unveiled. It documents the journey of the summit; from a nascent idea, its evolution over the years, to what lies ahead in the future.

The summit has hosted **88 esteemed speakers** as well as **over 3,500 participants** from over 40 countries in the past decade.

Seven luminary speakers are specially featured in the publication, such as Prof Ada Yonath who has attended every year since the very first edition, and other regular returning speakers like Prof Aaron Ciechanover and Sir Anthony Leggett.

A legacy of inspiration

Young scientists who participated in the summit in the past, have gone on to become notable scientists. Ten alumni shared their memories and experiences at the GYSS in the commemorative publication, and highlighted how the summit inspired them in their careers of science and research.

Dr Mary Kan, who is the Programme Director of Singapore Biodesign at the Agency for Science, Technology and Research (A*STAR), took part in the GYSS in 2014. She said: “I was awed by the stellar line-up of speakers, which included Nobel Laureates and renowned scientists in many fields, and had the chance to be exposed beyond my research area.”

Presidential Young Professor (Assistant Professor) from National University of Singapore’s (NUS) Department of Biomedical Engineering, **Dr Andy Tay**, recalled his time at the GYSS 2016: “During their talks, the Nobel Laureates shared their stories of rejection, and how they persevered and eventually got to where they are now.”

“Whenever I meet with challenges, for example in my experiments or manuscript and grant submissions, I remind myself of the stories they told, and motivate myself to continue working on impactful research projects,” he continued.

Please see **Annex A** for the full list of speakers and **Annex B** for more info on the sessions. Please click [here](#) for the full programme.

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Speakers attending the GYSS 2022 are:

1. Prof Aaron Ciechanover, Nobel Prize in Chemistry (2004)
2. Prof Ada Yonath, Nobel Prize in Chemistry (2009) (new)
3. Prof Alessio Figalli, Fields Medal (2018)
4. Sir Andre Geim, Nobel Prize in Physics (2010)
5. Prof Barry Marshall, Nobel Prize Physiology/Medicine (2005) (new)
6. Prof Benjamin List, Nobel Prize in Chemistry (2021)
7. Prof Cédric Villani, Fields Medal (2010)
8. Prof Didier Queloz, Nobel Prize in Physics (2019)
9. Sir Konstantin Novoselov, Nobel Prize in Physics (2010)
10. Prof Jayant Baliga, IEEE Medal of Honor (2014) (new)
11. Prof Leslie Valiant, Turing Award (2010)
12. Prof Michael Young, Nobel Prize Physiology/Medicine (2017)
13. Prof Ngô Bảo Châu, Fields Medal (2010) (new)
14. Dr Robert Langer, Millennium Technology Prize (2008)
15. Prof Stanley Whittingham, Nobel Prize Chemistry (2019)
16. Prof Stefan Hell, Nobel Prize Chemistry (2014) (new)
17. Prof Stuart Parkin, Millennium Technology Prize (2014)
18. Prof Takaaki Kajita, Nobel Prize in Physics (2015)
19. Prof Thomas Cech, Nobel Prize in Chemistry (1989)
20. Prof Thomas Südhof, Nobel Prize in Physiology/Medicine (2013)
21. Dr Venki Ramakrishnan, Nobel Prize Chemistry (2009)

Panel Discussions

Has Scientific Research Fundamentally Changed? [17 Jan, 4.15pm – 5.15pm]

This panel discussion will feature Prof Aaron Ciechanover, Prof Stefan Hell, and Dr Venki Ramakrishnan, who will discuss how the Covid-19 pandemic has provided leaps in scientific understanding; what impacts "Open Source" Science can bring; and what advances have been made possible in the past 2 years that previously would have taken a decade to achieve?

Artificial Intelligence, Ethics, and Governance [17 Jan, 7pm – 8pm]

With AI gaining prominence and being applied to address major challenges in our economy and society, it is important to consider the ethics and governance issues behind the use of AI. Field Medallist Prof Cédric Villani, Turing Awardee Prof Leslie Valiant, and Prof Simon Chesterman from NUS and AI Singapore will discuss about key ethical governance matters related to the research, development and application of AI.

Preparing for the next pandemic [18 Jan, 9am – 10am]

Moderated by Teo Yik Ying, the panel features local Prof Wang Linfa, along with Prof Robert Langer and Prof Thomas Cech, whose discovery of the catalytic properties of RNA led to the discovery of the CRISPR technique by one of his former students. Topics may include, how do we address age brackets, the current political and medical agenda, and how we are laying the foundation to be better prepared for the next pandemic in terms of research, development, and manufacturing. They will also discuss learning points from the COVID-19 pandemic and how we can improve pandemic preparedness, in terms of scientific and operational responses at national and international levels.

Startup Opportunities for Young Scientists [19 Jan, 9.45am – 10.45am]

Opportunities abound today for young scientists, who are creative, and think outside traditional research roles, by applying technology in creative ways to solve everyday problems. Young scientists are solving some of the most urgent challenges for pharma companies, and developing innovations that will help us mitigate climate change. Millennium Technology Prize winners, Prof Robert Langer, and Prof Stuart Parkin, along with Prof Alberto Sangiovanni-Vincentelli from the University of California Berkeley, will discuss about science and entrepreneurship, and how young scientists can create successful startups.

Unmet Challenges in Physics [19 Jan, 5pm – 6pm]

Prof Takaaki Kajita, Prof Didier Queloz, and Prof Artur Ekert will discuss what challenges in physics remain that are unmet. Some of their discussion points may touch on the origins of life, the impossible planet; cryptoreality, or how quantum randomness might emerge from special relativity; or the quest for physics outside the Standard Model.

Next Generation Grid [20 Jan, 9.45am – 10.45am]

Huge advances are being made at present as to how nations will generate and use regenerative energy over the next decade, whether by batteries, transistors, or how solar farms could feed energy from Australia to grids across Asia, for example. In this discussion, Prof Jayant Baliga, Prof Stanley Whittingham, and Prof Ron Hui, whose inventions on wireless charging platform technology underpin key dimensions of Qi, the world's first wireless power standard, will discuss the possibilities of the next generation grid.

Plenary Lectures

Included among the speakers are people who are changing the face of medicine, like Prof Aaron Ciechanover whose research is being used to produce ‘humans-on-a-chip’ to substitute humans and provide diversity in pharmaceutical clinical trials; Prof Ada Yonath, whose breakthrough research has demonstrable potential to create new antibiotics; and one of the most cited engineers in the world, Prof Thomas Sudhof, whose research and pharmaceutical startup will change the lives of those suffering from schizophrenia. There’s also Prof Michael Young, a circadian science researcher, whose team discovered that just like humans, when confined, lonely fruit flies eat more, sleep less.

There are also physicists who are changing our understanding of the earth and our role in the universe, such as Prof Didier Queloz, who is researching 55 Cancri e, an exoplanet covered in an ocean of lava that is similar to Earth when it was first formed; and Sir Andre Geim and Sir Konstantin Novoselov whose discovery of graphene is changing the world of material science by enabling the development of two-dimensional materials.

Among the speakers too are mathematicians and technologists, like Prof Alessio Figalli, whose proof of the Optimal Transport theory is helping in the storage and organisation of images, for example; Prof Leslie Valiant who is working to understand how humans memorise, so that machines can learn to do the same; and Prof Stuart Parkin, whose studies of spintronics has greatly impacted how data is stored.

Please click [here](#) for the full programme, which includes more details on the panel discussions and plenary lectures.