

INSTITUTE OF ADVANCED STUDIES

NANYANG TECHNOLOGICAL UNIVERSITY

Catalyse high-impact research | Transcend disciplinary boundaries | Expand knowledge & education frontiers

FEATURED ARTICLES

Revolutionising Global Electrification: The Legacy of Jayant Baliga and the IGBT

2024 Millennium Technology Prize



Prof Jayant Baliga revolutionised global electrification with his invention of the Insulated Gate Bipolar Transistor (IGBT), enabling efficient, compact power systems that power clean energy, electric transport, and industry - laying the foundation for sustainable and next-generation semiconductor technologies.

[Read more](#)

A Chat with Physics' Accidental Rockstar Prof Duncan Haldane



Prof Duncan Haldane, 2016 Nobel Laureate in Physics, revolutionised quantum science with his pioneering work on topological phases of matter. Driven by curiosity and a passion for teaching, he believes great discoveries often arise from small anomalies, inspiring new generations through open-minded exploration.

[Read more](#)

EVENT HIGHLIGHTS

IAS Frontiers Seminars: Quantum Horizons



This seminar series features leading physicists and engineers sharing the latest advances in quantum phenomena. As 2025 marks the United Nations International Year of Quantum Science and Technology, recent talks by Prof Shuyun Zhou (Tsinghua University) and Prof Paul Skrzypczyk (University of Bristol) highlighted how light and measurement innovations are advancing quantum materials and computing.

[Read more](#)

IAS Discovery Science Seminars and STEM Graduate Colloquia Jointly Organised with the Graduate Students' Clubs

Quantum Field Theory: A Universal Language



Prof Đàm Thanh Sơn (Dirac Medalist 2018) highlighted quantum field theory (QFT) as a universal language of physics. From phonons and critical phenomena to graphene and the fractional quantum Hall effect, his talk showcased QFT's profound power in unifying and advancing modern theoretical physics.

[Read more](#)

Memristive Materials and Devices for Post-Moore Electronics



Prof Mario Lanza (NUS) highlighted advances in neuromorphic computing, including memristive devices, 2D/CMOS hybrid chips, and NSRAM technology for efficient AI hardware, while introducing a global talent-matching platform driving innovation in materials and computing.

[Read more](#)

The Smallest Stepping Stone: Quantum Dot Physics Using Atomic Defects



Prof Hadar Steinberg (Hebrew University of Jerusalem) presented atom-sized quantum dots formed by defects in 2D insulators like hBN, integrated with graphene electrodes for tunable energy control, opening new possibilities for quantum sensing and device engineering.

[Read more](#)

Organic Semiconductors for Renewable Energy and Hydrogen Safety Applications



Prof Thomas Anthopoulos (University of Manchester) demonstrated how organic semiconductors drive renewable energy and hydrogen safety, featuring high-efficiency solar cells and sensitive hydrogen sensors that translate atomic-scale innovation into real-world impact.

[Read more](#)

From Algorithmic and Reinforcement Learning-Based to LLM-Powered Agents



Prof Bo An (CCDS, NTU) traced the evolution of intelligent systems from early networks to advanced AI, highlighting applications in finance, robotics, and adaptive decision-making, and concluded with an engaging Q&A.

[Read more](#)

Semiconductors as the New Frontiers: Convergence, Challenges and Startup Opportunities



Mr Don Ong, Head of Innovation at Advantest Corporation, highlighted semiconductors' role in advancing AI and quantum computing, emphasising interdisciplinary innovation, industry collaboration, and Southeast Asia's deep-tech potential.

[Read more](#)

UPCOMING EVENTS

Quantum Optics Meets Correlated Electronic States by Prof Mohammad Hafezi & Two-Dimensional Quantum Materials by Prof Alberto Morpurgo

IAS Frontiers Seminars: Quantum Horizons

Prof Mohammad Hafezi, 3 November 2025

Prof Alberto Morpurgo, 1 December 2025

SPMS MAS Executive Classroom 1

[Register now](#)

Nonlinear Topological Photonics

IAS STEM Graduate Colloquium by Prof Mohammad Hafezi

4 November 2025, SPMS LT4

[Register now](#)

Degradation and Stabilisation of Colloidal Perovskite Nanocrystals

IAS STEM Graduate Colloquium by Prof Qingsen Zeng

6 November 2025, SPMS LT5

[Register now](#)

© 2025 IAS NTU. All rights reserved.
Visit IAS website [here](#) for more information.



For enquiries, email us at iasevents@ntu.edu.sg

October 2025