The Institute of Advanced Studies at Nanyang Technological University

KOK KHOO PHUA AND LEONG-CHUAN KWEK
NANYANG TECHNOLOGICAL UNIVERSITY (NTU)

In July 2005, K.K. Phua, Tony Woo, (then vice president for research at Nanyang Technological University (NTU)), and Guaning Su (then president of NTU), met to establish an Institute of Advanced Studies (IAS) at Nanyang Technological University. This proposal was made possible with an endowment grant of SGD 10 million from the Lee Kong Chian Foundation and SGD 10 million from the Singapore government. The institute was formed to identify and push strategic research areas at NTU with appropriate research programs, supplemented with high-level international conferences and workshops. These conferences and workshops are organized with the help of eminent scientists to provide a "Nobel boost" to NTU's science and technology initiatives, establishing the hallmarks of science at the highest level.

In May 2006, the IAS organized its first workshop on spintronics. Two of the speakers, Shoucheng Zhang and Laurens W. Molenkamp, subsequently collaborated and kick-started a project on topological insulators from discussions at the meeting. The IAS has since organized many successful graduate schools and outreach activities. Some of the well-known schools include the first ever Les Houches School of Physics (91st session); the CERN-IAS (NTU) school on particle physics; and the ICTP (the Abdus Salam International Centre for Theoretical Physics)-IAS (NTU) schools.

The institute has also celebrated the achievements of many eminent scientists, including Murray Gellman, Chien-Ning Yang, Vladimir Korepin, Freeman Dyson, Abdus Salam, and Ruldoph Marcus. In 2018, the institute will celebrate the 100th anniversary of the birth of two famous physicists: Julian Schwinger (in February) and Richard Feynman (in October).

To shape the strategic directions of the institute, IAS is advised and guided by a committee of world-renowned

Fig. 1: Some of the posters produced by the IAS.

scientists, including 11 Nobel laureates and a Fields medallist. Mr George Yeo, a former minister for foreign affairs, is the patron of IAS.

Since its establishment in 2005, IAS at NTU has been generally regarded as one of the best institutes of advanced studies in the Asia Pacific region. The institute hosts a significant number of Nobel laureates and Fields medalists each year, and organizes a large number of high impact international conferences, workshops and schools across many disciplines in the Asia Pacific region. The institute has helped to promote interdisciplinary research and close collaborations between NTU and major centers of research around the world. It has also inspired numerous talented students through its many programs to move into a scientific career. Moreover, these events have allowed NTU faculty members and students to interact closely with eminent visitors and speakers from around the world. The multidisciplinary topics that IAS oversees include physics, chemistry, engineering, biomedical imaging, materials science, math, liberal arts, and urban planning.

IAS has cultivated a close rapport with many active scientists and distinguished scholars from numerous disciplines and from around the world, which has also helped to promote Singapore as a hub for international research and development. This successful model has encouraged the National Research Foundation to engage IAS with administrating the initial planning and organization of the well-known Global Young Scientists Summit (GYSS) each year in Singapore. The GYSS is modeled closely after the Lindau conferences organized by the Nobel Foundation each year.

Fig. 2: Some recent IAS Newsletters.

As an institute of advanced studies within a university, the IAS is also a member of the University-Based Institutes for Advanced Study (UBIAS).

In March 2018, the IAS at NTU will host the third series of Intercontinental Academia (ICA), where distinguished fellows from the arts and sciences will meet to focus on a thematic issue. The title of the theme for this year's meeting is "Laws: Rigidity and Dynamics". The ICA is typically held in two different institutes of advanced study and for 2018-2019 series, it will be held in Singapore and Birmingham, UK.

The Institute of Advanced Studies at NTU has also signed memoranda of understanding with many similar

Fig. 3: Participants at the recent conference in memory of Robert Brout on spontaneous symmetry breaking (Jan. 16-19, 2018).

organizations around the world. One active program has been signed with the Korea Institute of Advanced Studies in Seoul. IAS at NTU is also an active participating member of IAS conferences both in the Asia Pacific region and throughout the world. The IAS at NTU has its own fellowship program and it also has a joint fellowship program with the IAS at the University of Birmingham, UK. Aside from its fellowship program, the IAS at NTU also hosts several visiting professors each year.

Today, the IAS at NTU also hosts the secretariats for the International Union of Pure and Applied Physics (IUPAP) and the ASEAN Federation of Physics Societies (AFPS). IUPAP is an international physics community established in 1922 by 13 countries (Belgium, Canada, Denmark, France, Holland, Japan, Norway, Poland, Spain, Switzerland, United Kingdom, United States of America and the Union of South Africa) in Brussels. The first president of IUPAP was William Bragg. Since its inception, IUPAP has increased its membership to 61 countries worldwide.

The IAS at NTU produces a biannual newsletter that is distributed freely to numerous organizations and institutes around the world. Please refer to http://www.ntu.edu.sg/ias/newsletters/Pages/ default.aspx for more information.

Kok Khoo Phua is the founding director of the Institutes of Advanced Studies since its inception in 2005. He is an adjunct professor at the National University of Singapore (NUS) and Drexel University, USA. He is also a consultant to many government bodies and committees, as well as chairman and board member of various junior colleges and secondary schools in Singapore. He has contributed extensively to numerous organizations in Singapore, including the Lee Foundation, the Tan Kah Kee Foundation, the National Library Board, the CDAC (Chinese Development Assistance Council), CRISP (Centre for Remote Imaging, Sensing and Processing), and the Institute for Mathematical Sciences at NUS as well as overseas organizations like the Mathematical Sciences Research Institute, University of California at Berkeley, USA. In addition, he is also an honorary professor in various universities in China. For his many contributions, he was awarded the first President Award by the Institute of Physics, Singapore in 2006. He is also an elected fellow of the American Physical Society. Prof Phua's interests include phenomenology in high energy physics and science education.

L.C. Kwek is a principal investigator at the Center for Quantum Technologies, the National University of Singapore, since its inception. He is also the deputy director at the Institute of Advanced Studies at Nanyang Technological University, Singapore. He works on quantum information science and atomtronics and he has published more than 200 refereed papers on the subject. He is an elected fellow of the American Association for the Advancement of Science (AAAS), the Institute of Physics (UK) and the Institute of Physics (Singapore). He currently serves as a council member of the Tan Kah Kee Foundation (Singapore) and IUPAP (International Union of Pure and Applied Physics) WG5 (Women in Physics). He is the deputy secretary general of IUPAP and also an editorial member of the board of the Association of Asia Pacific Physical Societies Bulletin. L.C. Kwek was a co-recipient of the Singapore National Science Award (Team) in 2006, and received the IPS (Institute of Physics, Singapore) Premier Research Award (2006) and the IPS President Medal (2016). He is currently the president of the Asia Physics Olympiad International Board and he is also very active in Singapore's secondary school educational system.