Panel session on "Asia & Pacific: achievements and expectations from IUPAP"

Conveners

Kwek Leong Chuan, National University of Singapore
Sunil Gupta, Tata Institute of Fundamental Research, Mumbai, India
Kuijuan Jin, Chinese Academy of Sciences , Institute of Physics
Mihoko Nojiri (Chair), KEK Theory Center, Japan

Abstract

Asia-Pacific is possibly one of the most diverse region in terms of human development, geography, culture, language, connectivity and mobility etc. The IUPAP Centenary symposium offers an ideal platform to gather the physics community form this region close together. The first major step in that direction should be the enhancement of regional cooperation in research and education sectors of physics. The role of Association of Asia Pacific Physical Societies (AAPPS) would be critical for that objective and that would be articulated by Prof. Jun'ichi Yokoyama of Tokyo University. The second quantum revolution is on the anvil and is of critical importance for our region. The role of metamaterials for quantum information studies including quantum computing and quantum communication would be highlighted in the second presentation by Prof. Venugopal Achanta of National Physical Laboratory, India. The world-class high-energy particle accelerators are the bedrock of regional collaboration and in the third talk Prof. Xiaoyan Shen of the Chinese Academy of Sciences would highlight the role of these large facilities of Asia-Pacific. Future challenges in our region can only be met through a rapid development of cutting-edge industry. The physicists have been at the forefront of that development in the western countries and the final talk by Prof. William John Munro summarises the relevance of this connection for the Asia-Pacific region.

Cooperation in physics in the AsiaPacific Region

Jun'ichi Yokoyama, Association of Asia Pacific Physical Societies and The University of Tokyo

For more than three decades, the Association of Asia Pacific Physical Societies have been carrying out a number of activities to promote research and education of physics in the Asia Pacific region. Our member societies have huge diversities both in terms of size and their state of development.In this presentation I will introduce the current status of the AAPPS and discuss possible cooperation with IUPAP to help spread its coverage in our region and to become more prominent.

Metamaterials for quantum information studies
Venugopal Achanta, National Physical Laboratory, New Delhi, India

Quantum information sciences have wide-ranging applications which include computing, communication, and metrology. This requires bringing together experts from many disciplines. Major initiatives are underway in these areas, supported by the governments as well as industry. Forging intensive collaborations between various groups in the rapidly growing Asia-Pacific region would accelerate the progress in this critical area. Light-matter interaction at the sub-wavelength scales is likely to provide opportunities in reaching new coupling regimes where the vacuum states are themselves modified. Metamaterials, that are built with sub-wavelength featured materials, are promising for quantum devices of the future. After a brief introduction, present status and open challenges will be discussed.

The Large Facilities in Asia
Xiaoyan Shen, Institute of High Energy Physics, Chinese Academy of Sciences, China

Particle physics seeks answers to the questions; what are the building blocks of universe, and how they interact to form the universe? The Standard Model (SM) of physics, however, can not explain the existence of dark matter in the universe. The large particle physics facilities in Asia include, (1) BEPS in China to search exotic matter, (2) B-factories in KEK, Japan to search new interactions in flavor sector, (3) Daya Bay, China based reactor neutrino experiments, (4) Long baseline Hyper-K experiment in Japan to measure neutrino masses, (5) Underground facility JPUL to search for dark matter, (6) Space-borne DAMPE experiment to search dark matter and study high- energy cosmic rays.

The importance of physics in Industrial Research in Asia
William John Munro, NTT R&D, Japan

The USA and Europe have been at the forefront of the previous industrial revolutions. Historically Asian countries and regions were late comers. However in the last few decades, a number of those countries and regions have extensively invested in industrial R&D. China (and also China, Taipei), Japan, South Korea and several other countries are now leaders in key technology sectors including artificial intelligence, mobile and quantum technologies. In this talk, I will focus on the importance of physics in Asian industry and particularly that in Japan.