Kin-Fai Mak and Hai-Bo Yu won the 2016 OCPA Outstanding Young Researcher Award (Macronix Prize)

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Professor Kin-Fai Mak (Department of Physics, Penn State University) and Professor Hai-Bo Yu (Department of Physics, University of California at Riverside) are the co-winners of the 2016 Outstanding Young Researcher Award (Macronix Prize) of the International Organization of Chinese Physicists and Astronomers (OCPA).

The OYRA (Macronix Prize) is given each year to young ethnic Chinese physicists/astronomers outside of Asia in recognition of their outstanding achievements in physics. The Award carries a total cash prize of US $2,000 each and a certificate citing the awardee's accomplishments in research.

Prof. Mak received his undergraduate degree in physics at the Hong Kong University of Science and Technology in 2005. He finished his graduate studies in physics in 2010 under the supervision of Prof. Tony Heinz. Afterwards he became a Kavli postdoctoral fellow in the groups of Prof. Paul McEuen and Prof. Jiwoong Park at Cornell University for two years, before joining the Department of Physics at Penn State University in 2014.

Dr. Mak's research focuses on the unusual electronic properties emerged in the two-dimensional (2D) limit. An ideal system to approach this limit is the class of single-layer van der Waals' materials, in which the charge carriers are often confined to a monolayer of atoms. Mak's lab employs nanofabrication techniques, and optical and electrical probes to explore the properties of these materials. His most notable contributions include the spectroscopy studies of graphene and 2D transition metal dichalcogenides (TMDs), and the experimental demonstration of a unique valley degree of freedom in monolayer TMD semiconductors and the associated topological transport properties. Recently he becomes interested in the electronic phase transitions in single-layer metals with strong spin-orbit interactions, in which unique Ising superconductivity with mixed spin-singlet and spin-triplet Cooper pairing emerges.

Dr. Mak, at a very early stage of his career, has made landmark scientific discoveries at the frontiers of condensed matter physics. His primary achievements center on the optical properties of quantum materials at their extreme limit: two-dimensional crystals such as graphene and MoS_2 that are comprised of just a single layer of atoms. The fundamental understanding of these materials is potentially important for developing next generation optoelectronic devices that go beyond the constraints of conventional semiconductor logic chips, light sensors and light emitters. Dr. Mak has cut an astonishingly broad swath in this emerging field by carrying out seminal experiments, including the observation of universal absorption in single atomic layer materials, the establishment of single layer MoS_2 as the first two dimensional light emitting semiconductor, and the discovery of the valley Hall effect in MoS_2.

Many colleagues consider Dr. Mak to be a rising star in condensed matter physics. This is reflected in the recognition he has already attained as recipient of several honors and awards, including the 2013 International Union of Physics & Applied Physics Young Scientist Prize in Quantum Electronics, the 2012 Michelson Postdoctoral Prize (Case

Western Reserve University) and the Kavli Postdoctoral Fellowship (Cornell University). He joined the faculty at Penn State as an assistant professor in Fall 2014, supported by a Downsbrough Career Development Professorship. He was selected in 2015 for a prestigious DOE Early Career Research Program award and in 2016 for an AFOSR Young Investigator Award.

The winner of OCPA's 2016 OYRA Award (Macronix Prize) was selected by the following panel of distinguished physicists (in alphabetical order):

Professor Moses Chan	Pennsylvania State University
Professor Xiangdong Ji	University of Maryland and Shanghai Jiaotong University
Professor Jen-Chieh Peng	University of California, San Diego
Professor Lu Jeu Sham	University of California, San Diego
Professor Yuen-Ron Shen	University of California, Berkeley

The OCPA award activity is a continuing program and represents a long tradition of OCPA to recognize outstanding achievements of the members of the ethnic Chinese physics community. Previous OYRA winners include:

Shou-Cheng Zhang	(1992, Stanford University)
Terence Tai-Li Hwa	(1993, UC San Diego)
Zhi-Xun Shen	(1993, Stanford University)
Xiao-Gang Wen	(1994, MIT)
Gang Xiao	(1994, Brown University)
Wai Mo Suen	(1995, Washington University)
Hong Wen Jiang	(1996, UCLA)
Rui Rui Du	(1997, University of Utah)
Zi Qiang Qiu	(1997, UC Berkeley)
Nai-Chang Yeh	(1998, California Institute of Technology)
Wayne Hu	(1999, University of Chicago)
Chung-Pei Ma	(2000, University of Pennsylvania)
Zhen Yao	(2001, University of Texas)
Pengcheng Dai	(2002, University of Tennessee)
Hoi-Kwong Lo	(2002, University of Toronto)
Kun Yang	(2002, Florida State University)
Hui Cao	(2003, Northwestern University)
Jonathan Feng	(2003, University of California at Irvine)
Luming Duan	(2005, University of Michigan)
Cheng Chin	(2006, University of Chicago)
W. Vincent Liu	(2007, University of Pittsburgh)
Ho Bun Chan	(2008, University of Florida)
Feng Wang	(2008, University of California, Berkeley)
Congjun Wu	(2008, University of California, San Diego)
Chong-Yu Ruan	(2009, Michigan State University)
Dongping Zhong	(2009, Ohio State University)

QI, Xiaoliang	(2010, Stanford University)
XU, Cenke	(2011, University of California, Santa Barbara)
GAO, Xuan	(2012, Case Western Reserve University)
CHEN, Yulin	(2012, Oxford University)
FU, Liang	(2013, Massachusetts Institute of Technology)
HO, Shirley	(2014, Carnegie Mellon University)
NI, Kang-Kuen	(2014, Harvard University)
LI, Lu	(2015, University of Michigan)
SHIH, David	(2015, Rutgers University)