Lu Li and David Shih won the 2015 OCPA Outstanding Young Researcher Award (Macronix Prize)

****

Professor Lu Li (Department of Physics, University of Michigan) and Professor David Shih (Department of Physics, Rutgers University) are the co-winners of the 2015 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. Lu Li received his B.S. degree in Physics from the University of Science and Technology of China in 2002, and his. Ph.D. degree in Physics from Princeton University in 2008. He was a Pappalardo Fellow at Massachusetts Institute of Technology between 2008 and 2011. He joined the Department of Physics in 2011 as an assistant professor in the University of Michigan.

Dr. Lu Li's research interest lies in the area of experimental condensed matter physics, especially in the understanding of novel electronic and magnetic phases in strongly correlated materials. He is also interested in developing advanced instrumentation techniques to probe novel materials in extreme conditions. His major contributions to the field include the discoveries of: 1) the strong fluctuation diamagnetism in hole-doped cuprate high temperature superconductors; 2) the high field valley polarized phase in pure bismuth; 3) the negative compressibility and two-dimensional ferromagnetism in oxide heterointerface between lanthanum aluminate and strontium titanate; and 4) the quantum oscillations in topological Kondo insulator samarium hexaboride (SmB_6).

In his research, Prof. Li seeks to develop fundamental novel phenomena into real world applications by establishing new topological electronic and magnetic materials based on strong electron-electron interactions. As magnetic and electronic materials provide the foundation of the information industry, this work may lead to manufacturing breakthroughs, e.g., reducing reliance on globally scarce rare-earth elements for hard drives and sensors. His proposed basic research is very deep. Strong correlations among electrons lead to novel physics. Topological materials yield novel quasiparticle phases that can realize Majorana fermions, a concept that originated from the study of the neutrino and now could lead to fault-tolerant topological quantum computation. These materials can further be engineered to produce spin chiral transport, the topological magnetoeletric effect, and even magnetic monopoles. Prof. Li has proposed a new approach for designing, growing and testing new topological materials for these novel physical phenomena that excite physicists, mathematicians, and engineers. His career is highlighted by intelligent innovation and risk-taking. This spirit of innovation and risk-taking extends from his Ph.D. work at Princeton University, in which he studied the transport and magnetic properties of strongly correlated materials using a cantilever-based torque magnetometry he invented in order to push the measurement of magnetic moments to extreme conditions, to his work as a postdoctoral associate at MIT, where he

demonstrated a giant gate capacitance enhancement at oxide interfaces, thus proving his innovative idea of tuning transistors using much lower voltages, to his approach at Michigan of taking advantage of strong electron-electron interaction to study the topological insulator, SmB_6, based on his key idea that the effects of disorder would have minimal effect on the surface state. His research on SmB_6 has now firmly established this material as the first strongly-correlated topological insulator material.

The winner of OCPA's 2015 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
Professor Zhenguo Zhao   University of Science and Technology

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)