



## **Employment / Research Experience**

### **Postdoctoral Researcher**

**Department of Physics and Astronomy, Louisiana State University, July 2012 – Present**

- Characterize the structural and electronic properties layer-by-layer of a new Fe-based superconductor,  $\text{Ca}_{10}(\text{Pt}_4\text{As}_8)(\text{Fe}_{2-x}\text{Pt}_x\text{As}_2)_5$ , using low-temperature scanning tunneling microscopy (LT-STM)
- Design and develop a chamber system for second harmonic generation (SHG) and sum frequency generation (SFG) spectroscopy, as a part of collaboration
- Analyze azimuthal angular dependence of non-centrosymmetric GaAs(001) using femtosecond broadband SFG spectroscopy; investigate doping dependent SHG/SFG signal of the topological insulator  $\text{Bi}_{2-x}\text{Sb}_x\text{Se}_3$

**Department of Physics, The University of Texas at Austin, Sep. 2011 – June 2012**

- Fabricated and characterized Ag thin films for plasmonic studies using molecular beam epitaxy (MBE), LT-STM, and atomic force microscopy (AFM)
- Designed and developed multi-chamber connection system including MBE, low-energy electron diffraction (LEED), reflection high-energy electron diffraction (RHEED), and LT-STM while coordinating with researchers responsible for each system to effectively achieve research goals
- Designed chamber and transfer mechanism for connecting LT-STM and oxide MBE systems; worked with a graduate student to install and test the system

### **Graduate Research Assistant**

**Department of Physics, The University of Texas at Austin, Sep. 2004 – Aug. 2011**

- Analyzed quantum thin films using LT-STM: focused on atomic scale control of catalytic processes, phase relationship between surface energy and work function, and electron coherent coupling in metal heterostructures
- Prepared and characterized  $\text{SrTiO}_3(100)$  surface for STM study
- Trained four graduate students in STM operation and data analysis
- Managed group members for rotating safety duties to maintain a safe working environment

### **Research Assistant**

**Department of Physics, Yonsei University, Seoul, South Korea, Sep. 2003 – Aug. 2004**

- Developed fundamental knowledge of spintronics in the condensed matter theory group

## **Skills**

- Extensive expertise in UHV systems and LT-STM
- Familiarity with AFM, LEED, RHEED, scanning electron microscopy (SEM), and focused ion beam milling (FIB)
- Familiarity with metal thin film growth using vacuum deposition processes, including MBE
- Familiarity with SHG/SFG spectroscopy
- Experience designing, machining, and building UHV systems
- Computer skills: SolidWorks, Autodesk Inventor, WSxM, RHK and Nanonis scanning probe microscope controller systems

## **Teaching Experience**

### **Teaching Workshops**

#### **Online Scientific Teaching Institute @ LA-SiGMA, Summer 2013**

- Five week workshop on research-based best practices in teaching of subjects in science, technology, engineering, and math (STEM)

#### **Sloan-C Institute (now Online Learning Consortium), Fall 2013**

- One week workshop on online teaching

#### **Annual Faculty Colloquium at LSU, Spring 2013/Spring 2014**

- Lecture and workshop on designing courses for significant learning
- Lecture and workshop on maximizing face-to-face interaction for active learning in the classroom while utilizing technology effectively outside the classroom

#### **Webinar at LSU, Fall 2012/Fall 2013**

- 1.5 hour webinar on creating an active learning environment
- 1.5 hour webinar on preparing to teach online

### **Teaching Assistant**

#### **Dept. of Physics, Univ. of Texas at Austin**

- “Laboratory for PHY303K”, Fall 2004/Spring 2006: Organized and lectured multiple lab sessions
- “Elementary Physics for Nontech Students”, Fall 2006: Graded problem sets and exams
- “Modern Physics 2: Quantum Mechanics”, Spring 2005/Fall 2005: Graded problem sets and exams

#### **Dept. of Physics, Yonsei Univ., Seoul, South Korea**

- “General Physics”, Fall 2003/Spring 2004: Graded problem sets and exams

## Refereed Publications

- **Jisun Kim**, Hyoungdo Nam, Guorong Li, A. B. Karki, Zhen Wang, Yimei Zhu, Chih-Kang Shih, Jiandi Zhang, Rongying Jin, and E. W. Plummer: “Interrogating the superconductor  $\text{Ca}_{10}(\text{Pt}_4\text{As}_8)(\text{Fe}_{2-x}\text{Pt}_x\text{As}_2)_5$  Layer-by-layer”, submitted.
- Chen Chen, **Jisun Kim**, V. B. Nascimento, Zhenyu Diao, Jing Teng, Biao Hu, Guorong Li, Fangyang Liu, Jiandi Zhang, Rongying Jin, and E. W. Plummer: “Hidden Phases Revealed at the Surface of Double-Layered  $\text{Sr}_3(\text{Ru}_{1-x}\text{Mn}_x)_2\text{O}_7$ ”, submitted.
- Zhenyu Zhang, **Jisun Kim**, Rami Khoury, E. W. Plummer, and Louis H. Haber: “Surface Sum Frequency Generation Spectroscopy on Non-centrosymmetric Crystal GaAs (001)”, submitted.
- H.D. Nam, H. Chen, T.J. Liu, **J.S. Kim**, C.D. Zhang, J. Yong, T.R. Lemberger, P.A. Kratz, J.R. Kirtley, K.A. Moler, P.W. Adams, A.H. MacDonald, and C.K. Shih: “Ultra-thin Two-Dimensional Superconductivity with Strong Spin-orbit Coupling”, submitted.
- Yu-Jung Lu, Chun-Yuan Wang, **Jisun Kim**, Hung-Ying Chen, Ming-Yen Lu, Yen-Chun Chen, Wen-Hao Chang, Lih-Juann Chen, Mark I. Stockman, Chih-Kang Shih, and Shangjr Gwo: “All-Color Plasmonic Nanolasers with Ultralow Thresholds: Autotuning Mechanism for Single-Mode Lasing”, *Nano Lett.* **14**, 4381 (2014).
- Yanwen Wu, Chengdong Zhang, N. Mohammadi Estakhri, Yang Zhao, **Jisun Kim**, Matt Zhang, Xing-Xiang Liu, Greg K. Pribil, Andrea Alù, Chih-Kang Shih, and Xiaoqin Li: “Intrinsic Optical Properties and Enhanced Plasmonic Response of Epitaxial Silver”, *Adv. Mater.* **26**, 6106 (2014).
- **Jisun Kim**, Chendong Zhang, Jungdae Kim, Hongjun Gao, Mei-Yin Chou, and Chih-Kang Shih: “Anomalous Phase Relations of Quantum Size Effects in Ultrathin Pb Films on Si(111)”, *Phys. Rev. B* **87**, 245432 (2013).
- Yu-Jung Lu,\* **Jisun Kim**,\* Hung-Ying Chen, Chihhui Wu, Nima Dabidian, Charlotte E. Sanders, Chun-Yuan Wang, Ming-Yen Lu, Bo-Hong Li, Xianggang Qiu, Wen-Hao Chang, Lih-Juann Chen, Gennady Shvets, Chih-Kang Shih, and Shangjr Gwo: “Plasmonic Nanolaser Using Epitaxially Grown Silver Film”, *Science* **337**, 450 (2012). (\*Equally contributing authors.)
- **Jisun Kim**, Alexander Ako Khajetoorians, Wenguang Zhu, Zhenyu Zhang, and Chih-Kang Shih: “Atomic Scale Control of Catalytic Process in Oxidation of Pb Thin Films”, *Surf. Sci.* **606**, 450 (2012).
- Bo-Hong Li, Charlotte E. Sanders, James McIlhargey, Fei Cheng, Changzhi Gu, Guanhua Zhang, Kehui Wu, **Jisun Kim**, S. Hossein Mousavi, Alexander B. Khanikaev, Yu-Jung Lu, Shangjr Gwo, Gennady Shvets, Chih-Kang Shih, and Xianggang Qiu: “Contrast between Surface Plasmon Polariton-Mediated Extraordinary Optical Transmission Behavior in Epitaxial and Polycrystalline Ag Films in the Mid- and Far-infrared Regimes”, *Nano Lett.* **12**, 6187 (2012).
- Alexander Ako Khajetoorians, Wenguang Zhu, **Jisun Kim**, Shengyong Qin, Holger Eisele,

Zhenyu Zhang, and Chih-Kang Shih: “Adsorbate-induced Restructuring of Pb Mesas Grown on Vicinal Si(111) in the Quantum Regime”, *Phys. Rev. B* **80**, 245426 (2009).

### **Invited Talks**

- Institute of Physics, Academia Sinica, Taipei, Taiwan, May 2016  
“Hidden Phases in Layered Transition-metal Compounds Revealed at a Surface”
- Pohang University of Science and Technology: POSTECH, Pohang, South Korea, May 2014  
“STM/STS Study of Quantum Thin Films and Fe-based Superconductors”

### **Conference Abstracts**

- **Jisun Kim**, Hyoungdo Nam, Guorong Li, A. B. Karki, Zhen Wang, Yimei Zhu, Chih-Kang Shih, Jiandi Zhang, Rongying Jin, and E. W. Plummer: “Interrogating the superconductor  $\text{Ca}_{10}(\text{Pt}_4\text{As}_8)(\text{Fe}_{2-x}\text{Pt}_x\text{As}_2)_5$  Layer-by-layer”, *PEC 76<sup>th</sup>* (2016)
- **Jisun Kim**, Zhenyu Zhang, Matthew T. Curtis, Louis H. Haber, Rongying Jin, and E.W. Plummer: “Optical Second Harmonic Generation Study of Topological Insulator  $\text{Bi}_{2-x}\text{Sb}_x\text{Se}_3$ ”, *Bull. APS* **61** (2016).
- **Jisun Kim**, Zhenyu Diao, Jiandi Zhang, Rongying Jin, and E.W. Plummer: “STM study of lattice distortion effect on  $\text{Sr}_3(\text{Ru}_{1-x}\text{Mn}_x)_2\text{O}_7$  surfaces”, *Bull. APS* **60** (2015).
- **Jisun Kim**, Hyoungdo Nam, Guorong Li, Amar Karki, Chih-Kang Shih, Jiandi Zhang, Rongying Jin, and E.W. Plummer: “STM/STS study of superconducting properties in  $\text{Ca}_{10}(\text{Pt}_4\text{As}_8)(\text{Fe}_2\text{As}_2)_5$ ”, *Bull. APS* **59** (2014).
- **Jisun Kim**, Guorong Li, Amar Karki, Jiandi Zhang, Rongying Jin, and E.W. Plummer: “Surface structure and electronic properties in  $\text{Ca}_{10}(\text{Pt}_4\text{As}_8)(\text{Fe}_2\text{As}_2)_5$ ”, *Bull. APS* **58** (2013).
- **Jisun Kim**, Yang Meng, Z. Q. Qiu, and Chih-Kang Shih: “Engineering an Epitaxial Dielectric/Metal/Dielectric Trilayer System”, *Bull. APS* **57** (2012).
- **Jisun Kim**, Chendong Zhang, Hongjun Gao, and Chih-Kang Shih: “Electron Coherence in Pb/Ag Heterostructures Epitaxially Grown on Si(111)”, *Bull. APS* **56** (2011).
- **Jisun Kim**, Jungdae Kim, Chendong Zhang, and Chih-Kang Shih: “Influence of Quantum Well States on Homo-epitaxy of Pb on Ultra-thin Pb Films”, *Bull. APS* **55** (2010).
- **Jisun Kim**, Alexander Ako Khajetoorians, Wenguang Zhu, Zhenyu Zhang, and Chih-Kang Shih: “Surface-catalyzed  $\text{O}_2$  Adsorption on Quantum Thin Films”, *AVS 56<sup>th</sup> International Symposium & Exhibition* (2009).
- **Jisun Kim**, Alexander Ako Khajetoorians, Wenguang Zhu, Zhenyu Zhang, and Chih-Kang Shih: “Surface-catalyzed  $\text{O}_2$  Adsorption on Quantum Thin Films”, *Bull. APS* **54** (2009).