

# Linyou Cao

Associate Professor of Materials Science and Engineering, and Physics  
North Carolina State University  
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Google Scholar Profile: <http://scholar.google.com/citations?user=87sZ5dgAAAAJ&hl=en>

## EDUCATION

Ph.D., Materials Science and Engineering, Stanford University	2010
M.S., Materials Science and Engineering, Drexel University	2006
M.S., Chemistry, Peking University, China	2002
B.S., Chemistry, Fudan University, China	1999

## PROFESSIONAL APPOINTMENTS

Associate Professor of Materials Science, North Carolina State University	2016-
Assistant Professor of Materials Science, North Carolina State University	2011-2016
Miller Research Fellow, University of California Berkeley	2010-2011

## RECENT HONORS

CAREER Award, National Science Foundation	2014
Finalist, Cherokee-McDonough Challenge	2013
Young Investigator Award, Army Research Office	2013
Ralph E. Powe Junior Faculty Enhancement Award, Oak Ridge University Associates	2012
Division of Inorganic Chemistry Young Investigator Award, American Chemical Society	2010
Miller Research Fellowship, University of California-Berkeley	2009

## PROFESSIONAL SERVICES

- Co-Founder of Atomix LLC (2Dlayer)
- Leading organizer for Symposia on 2D materials “*Emerging 2D Non-graphene Materials*” at MRS 2017, 2016, and 2015 Spring Conference
- Leading organizer for Symposia on nanophotonics “*Resonant Optics: Fundamentals and Applications*” at MRS 2014, 2013 Spring Conference
- Session chair, for the “*2D Materials: Device Physics & Applications*” session at the AVS 60th International Symposium, Long Beach, CA, USA, October 27 - November 1, 2013
- Session chair, for the “*2D beyond graphene*” focused topic at the APS March Meeting, CO, Denver, March 3 - 7, 2014
- User proposal review, for the Center of Functional Nanomaterials at the Brookhaven National Lab

- Program committee member, the 13th IEEE International Conference on Nanotechnology, August 5-8, 2013, Beijing, China
- Program committee member, the AVS Novel 2D Materials Focus Topic (2D-FT) at the AVS-61 International Symposium, Baltimore, MD, November 9-14, 2014
- Active proposal reviewer for National Science Foundation, Army Research Office, American Chemical Society Petroleum Fund, and ETH Zurich Research Commission.
- Active journal review referee for more than 15+ scientific journals, including *Nature Photonics*, *Nature Communications*, *Physical Review Letters*, *Physical Review B*, *Nano Letters*, *ACS Nano*, *ACS Photonics*, *Angewandte Chemie International Edition*, *Advanced Functional Materials*, *Advanced Materials*, *Advanced Optical Materials*, *Small*, *Optics Letters*, *Optical Express*.
- Professional membership: MRS, APS, SPIE, and OSA

## UNIVERSITY SERVICES

- Graduate admission committee, Department of Materials Science and Engineering, NCSU, 2011Spring
- Graduate qualification exam committee, Department of Materials Science and Engineering, NCSU, 2011-2012 Spring
- Undergraduate curriculum committee, Department of Materials Science and Engineering, NCSU, 2011- present
- Department safety committee, Department of Materials Science and Engineering, NCSU, 2013 – present
- Graduate qualification exam committee, Department of Materials Science and Engineering, NCSU, 2013-2014 Spring
- Faculty search committee, Department of Materials Science and Engineering, NCSU, 2015-2016
- Graduate qualification exam committee, Department of Materials Science and Engineering, NCSU, 2016-2017 Fall
- Advisory committee for the NNF 2015-present
- University Standing Committee on International Programs, 2016- present

## PATENT AND TECHNOLOGY TRANSFER

- Linyou Cao, Yifei Yu, Brian C. Iezzi, Yanpeng Li, “A Novel Process for Scalable Synthesis of Molybdenum Disulfide Monolayer and Few-layer Films” (US 61/821,289)

## STUDENT ADVISEES

- PhD students: Yiling Yu (08/2011 - ), Yifei Yu (08/2011- ), Lujun Huang (08/2012 - ), Alper Gurarlan (08/2013 - ), Guoqing Li (02/2015-)
- Undergraduate student: Lin Zhu (08/2013 - )
- Former advisees:
  - *Postdoc:* Emre Sari (01/2013-08/2013), Chun Li (09/2011-08/2012), Shi Hu (10/2012 -11/2013)

Graduate students: Yanpeng Li (visiting student, 09/2012 – 05/2014), Lin Jiao (visiting student, 10/2013 – 10/2014) Maolong Tang (rotation graduate student, 05/2012-12/2012), Liang Huang (visiting graduate student, 09/2011-08/2012); Xiang Ji (08/2011-02/2012)

Undergraduate students: Gayatri Pongur Snigdha (08/2011-05/2012) ; Thomas Payne (09/2011-05/2013) ; Cody Heiman (REU student, 06/2012-08/2012); Brian Iezzi (08/2012-08/2013). Lin Zhao (visiting summer student, 07/2011-08/011), Qiaochu Li (2016 summer), Keith Vandegrift (06/2015-08/2015)

High school students: Guy Blanc (05/2014-09/2014), Amy Xu (05/2012-08/2012, semifinalists of Siemens and ISTS competitions, now at Stanford), Margaret Tian (05/2013-08/2013, finalist of Siemens competition, now at MIT), Albert Feng (05/2013-08/2013, now at Stanford), Ashley Yang (2015 summer), August Ning (2015 summer, now at Duke).

- Defense Committee: Yixin Yan (M.S., 05/2012), Yohan Yoon (Ph.D., 12/2012), Wei-Chen Wu, Bryan Anderson(PhD, 07/2016), Martin Dufficy (PhD, 07/2016), Shanshan Yao.

## TEACHING

- Spring 2012, MSE 200 “Mechanical Properties of Structural Materials” enrollment ~100
- Fall 2012, MSE 200 “Mechanical Properties of Structural Materials” enrollment ~50
- Spring 2013, MSE 200 “Mechanical Properties of Structural Materials” enrollment ~110
- Spring 2014, MSE 200 “Mechanical Properties of Structural Materials” enrollment ~110
- Fall 2014, MSE 200 “Mechanical Properties of Structural Materials” enrollment ~110
- Spring 2015, MSE 791 “Applied Electromagnetics and Nanophotonics” enrollment ~5
- Fall 2015, MSE 301 “Thermodynamics” enrollment ~35
- Spring 2016, MSE 200 “Mechanical Properties of Structural Materials” enrollment ~85
- Fall 2016, MSE 301 “Thermodynamics” enrollment ~42

## JOURNAL PUBLICATIONS

- 50+ peer-reviewed papers with 5200+ citations and a H-index of 29 (*Source: Google Scholar*).

### 1) Peer-reviewed Publications of Independent Work at NCSU

#### Two-dimensional Materials

- 1) Yiling Yu, Alexander Bataller, Yifei Yu, Guoqing Li, Kenan Gundogdu, and **Linyou Cao**, Room-Temperature Exciton Condensation in Atomically Thin Transition Metal Dichalcogenide Materials, *Submitted*, (2016).
- 2) Guoqing Li, Du Zhang, Yifei Yu, Stefano Curtarolo, Weitao Yang, and **Linyou Cao**, Mechanism of Activating MoS<sub>2</sub> for Hydrogen Evolution, *Submitted*, (2016).
- 3) Lujun Huang, Guoqing Li, Yiling Yu, Yongqing Cai, and Yong-Wei Zhang, and **Linyou Cao** Thermosistor: Electrically Gating Interfacial Thermal Conductivity, *Submitted*, (2016).
- 4) Yifei Yu, Lujun Huang, Guoqing Li, Yongqing Cai, Andrew Barrette, Kenan Gundogdu, and Yong-Wei Zhang, and **Linyou Cao**, Engineering Multifunctionality of Transition Metal Dichalcogenide Monolayers via Intercalation of Molecules and Ions, *Submitted*, (2016).

- 5) Yiling Yu, Yifei Yu, Lujun Huang, Haowei Peng, and **Linyou. Cao** , Giant Gating Tunability in Refractive Index of Transition Metal Dichalcogenide Monolayers, *Submitted*, (2016).
- 6) Guoqing Li, Du Zhang, Qiao Qiao, Yifei Yu, David Peterson, Abdullah Zafar, Raj Kumar, Stefano Curtarolo, Frank Hunte, Steve Shannon, Yimei Zhu, Weitao Yang, and **Linyou Cao**, All The True Catalytic Sites of MoS<sub>2</sub> for Hydrogen Evolution, *J. Am. Chem. Soc.*, DOI: 10.1021/jacs.6b05940, (2016).
- 7) Alper Gurarlsan, Shuping Jiao, Tai-de Li, Guoqing Li, Yiling Yu, Yang Gao, Elisa Riedo, Zhiping Xu, Linyou Cao, Van der Waals Force Isolation of Monolayer MoS<sub>2</sub>, *Adv. Mater.* DOI: 10.1002/adma.201601581, (2016)
- 8) L. Huang, G. Li, A. Gurarlsan, Y. Yu, R. Kirste, W. Guo, J. Zhao, R. Collazo, Z. Sitar, G. N. Parsons, M. Kudenov, and **L. Cao**, Atomically Thin MoS<sub>2</sub> Narrowband and Broadband Light Superabsorbers, *ACS Nano*, DOI: 10.1021/acsnano.6b02195, (2016)
- 9) Y. Yu, Y. Yu, C. Xu, Y.-Q. Cai, L. Su, Y. Zhang, Y.-W. Zhang, K. Gundogdu, and **L. Cao**, Engineering Substrate Interactions for High Luminescence Efficiency of Transition Metal Dichalcogenide Monolayers, *Adv. Func. Mater.*, DOI: 10.1002/adfm.201600418, (2016).
- 10) Y. Yu, Y. Yu, C. Xu, A. Barrette, K. Gundogdu, and **L. Cao**, Fundamental Limits of Exciton-Exciton Annihilation for Light Emission in Transition Metal Dichalcogenide Monolayers, *Phys. Rev. B Rapid Communication* 93, 20111(R), (2016).
- 11) Yifei Yu, Shi Hu, Liqin Su, Alexander A. Puzdov, David B. Geohegan, Yong Zhang, **Linyou Cao**, Equally Efficient Interlayer Excitonic Relaxation and Improved Absorption in Epitaxial and Non-epitaxial Monolayer MoS<sub>2</sub>/WS<sub>2</sub> Heterostructures, *Nano Lett.* 15, 486-491 (2015).  
**ESI Highly Cited Paper**
- 12) Yifei Yu, Shengyang Huang, Yanpeng Li, Stephan Steinmann, Weitao Yang, **Linyou Cao** , Layer-dependent Electrocatalysis of MoS<sub>2</sub> for Hydrogen Evolution, *Nano Lett.* 14, 553-558 (2014). **ESI Highly Cited Paper**
- 13) Cong Mai, Andrew Barrette, Yifei Yu, Yuriv Semenov, Ki Wook Kim, **Linyou Cao**, Kenan Gundogdu, Many Body Effects in Valleytronics: Direct Measurement of Valley Lifetimes in Single Layer MoS<sub>2</sub>, *Nano Lett.* 14, 202-206(2014). **ESI Highly Cited Paper**
- 14) Yifei Yu, Chun Li, Yi Liu, Liqin Su, Yong Zhang, **Linyou Cao**, Controlled Scalable Synthesis of Uniform, High Quality Monolayer and Fewlayer MoS<sub>2</sub> Films, *Sci. Rep.* 3, 1866 (2013). **ESI Highly Cited Paper**
- 15) S. Z. Butler , S.M. Hollen, **L. Cao**, Y. Cui, J. A. Gupta, H. R. Gutiérrez, T. F. Heinz, S. S. Hong, J. Huang, A. F. Ismach, E. Johnston-Halperin, M. Kuno, V. V. Plashnitsa , R. D. Robinson, R. S. Ruoff, S. Salahuddin, J. Shan, L. Shi, M. G. Spencer, M. Terrones , W. Windl, J. E. Goldberger, Progress, Challenges, and Opportunities in Two-Dimensional Materials Beyond Graphene. *ACS Nano* 7 (2013) 2898-2926. **ESI Highly Cited Paper**
- 16) Yiling Yu, Yifei Yu, Yongqing Cui, Wei Li, Alper Gurarlsan, Hartwin Peelaers, David E. Aspnes, Chris G. Van de Walle, Nhan V. Nguyen, Yong-Wei Zhang, **Linyou Cao**, Exciton-dominated Optical Functions of MoS<sub>2</sub> Atomically Thin Films, *Sci. Rep.*, 5, 16996 (2015)

- 17) Ehren M Mannebach, Renkai Li, Karel-Alexander N Duerloo, Clara Nyby, Peter Zalden, Theodore Vecchione, Friederike Ernst, Alex Hume Reid, Tyler Chase, Xiaozhe Shen, Stephen Weathersby, Carsten Hast, Robert Hettel, Ryan Coffee, Nick Hartmann, Alan R Fry, Yifei Yu, **Linyou Cao**, Tony F Heinz, Evan J Reed, Hermann Dürr, Xijie Wang, Aaron M Lindenberg, Dynamic structural response and deformations of monolayer MoS<sub>2</sub> visualized by femtosecond electron diffraction **Nano Lett.** 15, 6889-6895 (2015)
- 18) **Linyou Cao**, Two-dimensional Transition Metal Dichalcogenide Materials; Toward An Age of Atomic-Scale Photonics, **MRS Bulletin**, 40, 592-299 (2015)
- 19) Alper Gurarlsan, Yifei Yu, Liqin Su, Yiling Yu, Francisco Suarez, Shanshan Yao, Yong Zhu, Mehmet Ozturk, Yong Zhang, **Linyou Cao**, Surface Energy-Assisted Perfect Transfer of Centimeter-scale Monolayer and Fewlayer MoS<sub>2</sub> Films onto Arbitrary Substrates, **ACS Nano**, 8, 11522-11528 (2014)
- 20) Yanpeng Li, Yifei Yu, Sheng-Yang Huang, Yufeng Huang, Williams A. Goddard III, Yao Li, **Linyou Cao**, Engineering the Composition and Crystallinity of Molybdenum Sulfide for High-performance Electrocatalytic Hydrogen Evolution, **ACS Catalysis**, 5, 448-455 (2015)
- 21) E. M. Mannebach, S. Nah, Y. Kuo, Y. Yu, K. N. Duerloo, A. Marshall, E. J. Reed, **L. Cao**, A. M. Lindenberg, Ultrafast Nonlinear Optical Response of Monolayer MoS<sub>2</sub> under Intense Photoexcitation Conditions, **ACS Nano** 8, 10734-10742 (2014)
- 22) Cong Mai, Yuriy G. Semenov, Andrew Barrette, Yifei Yu, Zhenghe Jin, **Linyou Cao**, Ki Wook Kim, Kenan Gundogdu, Exciton valley relaxation in a single layer of WS<sub>2</sub> measured by ultrafast spectroscopy, **Phys. Rev. B**, 90, 041414(2014).
- 23) Liqin Su, Yong Zhang, Yifei Yu, **Linyou Cao**, Dependence of Coupling of Quasi 2-D MoS<sub>2</sub> with Substrate on Substrate Type, Probed by Temperature Dependent Raman Scattering, **Nanoscale** , 6, 4920-4927 (2014).
- 24) Kun Fu, Yanpeng Li, Mahmut Dirican, Chen Chen, Yao Lu, Jiadeng Zhu, Yao Li, **Linyou Cao**, Philip D Bradford, Xiangwu Zhang, Sulfur gradient-distributed CNF composite: a self-inhibiting cathode for binder-free lithium-sulfur batteries, **Chem. Commun.** 50, 10277-10280 (2014)
- 25) Chun Li, Yifei Yu, Miaofang Chi, **Linyou Cao**, Epitaxial Nanosheet - Nanowire Heterostructures, **Nano Lett.** 13 (2013) 948-953.
- 26) Liang Huang, Yifei Yu, Chun Li, **Linyou Cao**, Substrate Mediation in Vapor Deposition Growth of Layered Chalcogenide Nanoplates: A Case Study of SnSe<sub>2</sub>, **J. Phys. Chem. C** 117 (2013) 6469-6475.
- 27) Chun Li, Liang Huang, Gayatri Snyder, Yifei Yu, **Linyou Cao**, Role of Boundary Layer Diffusion in Vapor Deposition Growth of Chalcogenide Nanosheets: The Case of GeS, **ACS Nano** 6 (2012) 8868-8877.

### **Dielectric Metamaterials**

- 28) Jiao Lin, Lujun Huang, Yiling Yu, Sailing He, **Linyou Cao**, Deterministic phase engineering for optical Fano resonances with arbitrary lineshape and frequencies, **Opt. Express**, 23, 19154-19165 (2015).
- 29) Yiling Yu, Lujun Huang, **Linyou Cao**, Semiconductor Solar Superabsorbers, **Sci. Rep.** 4, 4107 (2014).

- 30) Yiling Yu, **Linyou Cao**, Leaky Mode Engineering: Leaky Mode Engineering: A General Design Principle for Dielectric Optical Antenna Solar Absorbers, **Optics Communications**, 314, 79-85 (2013). (Invited paper)
- 31) Lujun Huang, Yiling Yu, **Linyou Cao**, General Modal Properties of Optical Resonances in Rectangular and Triangular Dielectric Structures, **Nano Lett.** 13 (2013) 3559-3565.
- 32) Yiling Yu, **Linyou Cao**, The Phase Shift of Light Scattering at Sub-wavelength Dielectric Structures, **Opt. Express** 21 (2013) 5957-5967.
- 33) Yiling Yu, Vivian E. Ferry, A Paul Alivisatos, **Linyou Cao**, Dielectric Core-shell Optical Antennas for Strong Solar Absorption Enhancement, **Nano Lett.** 12 (2012) 3674-3681.
- 34) Yiling Yu, **Linyou Cao**, Coupled leaky mode theory for light absorption in 2D, 1D, and 0D semiconductor nanostructures, **Opt. Express** 20 (2012) 13847-13856.

## 2) Peer-reviewed Publications as a Graduate Student

- 35) **Linyou Cao**, Justin S. White, JoonShik Park, Jon A. Schuller, Bruce M. Clemens, Mark L. Brongersma, Engineering Light Absorption in Semiconductor Nanowire Devices, **Nature Mater.** 8 (2009) 643. **ESI Highly Cited Paper**
- 36) **Linyou Cao**, Pengyu Fan, Alok Vasudev, Justin S. White, Zongfu Yu, Wenshan Cai, Jon A. Schuller, Shanhui Fan, Mark L. Brongersma, Semiconductor Nanowire Optical Antenna Solar Absorbers, **Nano Lett.** 10 (2010) 439. **ESI Highly Cited Paper**
- 37) Pengyu Fan, Uday K. Chettiar, **Linyou Cao**, Farzaneh Afshinmanesh, Nader Engheta, Mark L. Brongersma An invisible metal-semiconductor photodetector, **Nature Photon.** 6 (2012)380-385. **ESI Highly Cited Paper**
- 38) **Linyou Cao**, JoonShik Park, Pengyu Fan, Bruce M. Clemens, Mark L. Brongersma, Resonant Germanium Nano-Antenna Photodetector, **Nano Lett.** 10 (2010) 1229-1233. **ESI Highly Cited Paper**
- 39) **Linyou Cao**, Pengyu Fan, Ed Barnard, Ana Brown, Mark L. Brongersma, Tuning the Color of Silicon Nanostructures, **Nano Lett.** 10 (2010) 2649-2654.
- 40) **Linyou Cao**, David N. Barsic, Alex R. Guichard, Mark L. Brongersma, Plasmon-assisted Local Temperature Control to Pattern Individual Semiconductor Nanowires and Carbon Nanotubes, **Nano Lett.** 7 (2007) 3523.
- 41) **Linyou Cao**, Bahram Nabet, Jonathan E. Spanier, Enhanced Raman Scattering from Individual Semiconductor Nanocones and Nanowires, **Phys. Rev. Lett.** 96 (2006) 15740.
- 42) **Linyou Cao**, Pengyu Fan, Mark L. Brongersma, Optical Coupling of Deep-Subwavelength Semiconductor Nanowires, **Nano Lett.** 11 (2011) 1463-1468.
- 43) **Linyou Cao**, Mark L. Brongersma, Active Plasmonics: Ultrafast developments, **Nature Photonics** 3 (2009) 12.
- 44) **Linyou Cao**, Bora Garipcan, Eric Gallo, Stephen S. Nonnemann, Bahram Nabet, Jonathan E. Spanier, Excitation of Local Field Enhancement on Silicon Nanowires, **Nano Lett.** 2 (2008) 601.
- 45) Pengyu Fan, Kevin C. Y. Huang, **Linyou Cao**, and Mark L. Brongersma, Redesigning Photodetector Electrodes as an Optical Antenna, **Nano Lett.** 13 (2013) 392-396

- 46) **Linyou Cao**, Lee Laim, Patricia Valenzuela, Bahram Nabet, Jonathan E. Spanier, On the Raman Scattering from Semiconducting Nanowires, **J. Raman Spectroscopy** 38 (2007) 697.
- 47) **Linyou Cao**, Peng Diao, Tao Zhu, Zhongfan Liu, Surface-Enhanced Raman Scattering of p-Aminothiophenol on a Au(core)/Cu(shell) Nanoparticle Assembly, **ChemPhysChem** 6 (2005) 913 - 918.
- 48) Ying Xiang, I Zardo, Linyou Cao, Tonko Grama, Martin Heiss, Joan-Ramon Morante, Jordi Arbiol, Mark L. Brongersma, Anna Fontcuberta i Morral, Spatially Resolved Raman Spectroscopy on Indium-catalyzed Core-shell Germanium Nanowires: Size Effects, **Nanotechnology** 21 (2010) 105703.
- 49) Ying Xiang, **Linyou Cao**, Gerhard Abstreiter<sup>1</sup>, Mark L. Brongersma, Anna Fontcuberta i Morral, Synthesis Parameter Space of Bismuth Catalyzed Germanium Nanowires, **Appl. Phys. Lett.** 94 (2009)163101.
- 50) Ying Xiang, **Linyou Cao**, S. Conesa-Boj, S. Estrade, Jordi Arbiol, F. Peiro, J.R. Morante, Mark L. Brongersma, Anna Fontcuberta i Morral, Single Crystalline and Core-shell Indium Catalyzed Germanium Nanowires – A Systematic Thermal CVD Growth Study, **Nanotechnology** 20 (2009) 245608.
- 51) **Linyou Cao**, Bora Garipcan, Jeniffer S Atchison, Chaoying Ni, Bahram Nabet, Jonathan E. Spanier, Instability and Transport of Metal Catalyst in the Growth of Tapered Silicon Nanowires, **Nano Lett.** 6 (2006) 1852.
- 52) **Linyou Cao**, Lee Laim, Chaoying Ni, Bahram Nabet, Jonathan E. Spanier, Diamond-hexagonal Semiconductor Nanocones with Controllable Apex Angle, **J. Am. Chem. Soc.** 127 (2005) 13782.
- 53) **Linyou Cao**, Tao Zhu, Zhongfan Liu, Formation Mechanism of Nonspherical Gold Nanoparticles during Seeding Growth: Roles of Anion Adsorption and Reduction Rate, **J. Colloid Interface Sci.** 293 (2006) 69-76.
- 54) **Linyou Cao**, Yang Chai, Pingjian Li, Zhiyong Shen, Jinlei Wu, Efficient Self-assembly of Transition Metal Oxide Nanoclusters on Silicon Substrates, **Thin Solid Film** 492 (2005 ) 13.
- 55) **Linyou Cao**, Lianming Tong, Peng Diao, Tao Zhu, Zhongfan Liu, Kinetically Controlled Pt Deposition onto Self-Assembled Au Colloids: Preparation of Au(Core)-Pt(Shell) Nanoparticle Assemblies, **Chem. Mater.** 16 (2004) 3239-3245.
- 56) **Linyou Cao**, Peng Diao, Tao Zhu , Zhongfan Liu, Uniform Electrochemical Deposition of Copper onto Self-assembled Gold Nanoparticles, **J. Phys. Chem. B** 108 (2004)3535 -3539.

## INVITED PRESENTATIONS

### Departmental Seminar

1. Tutorial on 2D Transition Metal Dichalcogenide Materials, Center for the Computational Design of Functional Layered Materials, Temple University, Philadelphia, July 29, 2016
2. Tutorial on 2D Transition Metal Dichalcogenide Materials, Center for the Computational Design of Functional Layered Materials, Temple University, Philadelphia, July 29, 2016

3. Tutorial on 2D Transition Metal Dichalcogenide Materials, Center for the Computational Design of Functional Layered Materials, Temple University, Philadelphia, July 29, 2016
4. Department of Mechanical Engineering, Columbia University, Feb. 4, 2016
5. Duke Photonics Seminar, Duke University, September 15, 2015
6. Tutorial on 2D Transition Metal Dichalcogenide Materials, Center for the Computational Design of Functional Layered Materials, Temple University, Philadelphia, Oct. 2, 2015
7. Department of Materials Science and Engineering, University of Pennsylvania, October 1, 2015
8. Department of Physics, Fudan University, August 7, 2015
9. Joint School of Shanghai JiaoTong University and University of Michigan, August 2, 2015
10. Suzhou Institute of Nano-Tech and Nano-Bionics (SINANO), July 24, 2015
11. School of Materials Science and Engineering, Nanjing University of Science and Technology, July 15, 2015
12. Energy Science Institute, Yale University, April 27, 2015
13. Department of Physics, University of Kansas, Dec. 1, 2014
14. Department of Chemistry, Brown University, Oct. 30, 2014
15. Materials Research Lab, The University of California, Santa Barbara, Apr. 25, 2014
16. Materials Research Society Seminar, The University of North Carolina-Chapel Hill, Jan. 30, 2014
17. Joint School of Nanoscience and Nanoengineering, The University of North Carolina, Greensboro, Jan. 25, 2014
18. Department of Chemistry, Fudan University, China, Dec. 22, 2013
19. Department of Mechanical Engineering and Materials Science, Duke University, Nov. 18, 2013
20. Army Research Lab, Adelphi, MD, Sept. 14, 2013,
21. Complex Matter and Biophysics Seminar, North Carolina State University, Mar. 27, 2012
22. Department of Chemistry, University of California, Merced; CA, Merced; April 2011

### **Workshop/Conferences**

1. Graphene and 2D Materials Symposium, 2017 TechConnect World Innovation Conference, Washington DC, USA, May 2017
2. MRS 2017 Spring Conference, Arizona, April 2017
3. SPIE Photonics West, San Jose, Jan. 2017
4. Micro- & Nano- Photonics Workshop, Fudan University, Shanghai, August 2016
5. PIERS conference, Shanghai, August 2016,
6. SPIE Defense+Security Sensing Technology+Applications (SPIE DSS) conference, Baltimore, MD, April 2016,
7. Workshop on Science and Technology of 2D materials, University of Central Florida,, August 22, 2015
8. International Symposium on Physics and Device Applications of Two-dimensional Materials, Nanjing, China, July 13-15, 2015



9. NSF US-EU Workshop on 2D Layered Materials and Devices, Arlington,VA, April 22, 2015
10. Tutorial: 2D Transition Metal Dichalcogenide Materials: Synthesis, Properties, and Applications, MRS 2015 Spring Conference, San Francisco, April 6-10, 2015
11. 249th ACS meeting, Denver, CO, March 22-26, 2015.
12. MRS 2015 Spring Conference, San Francisco, April 6-10, 2015
13. GrapChina 2014, Ningbo, China, Sept. 1-3, 2014
14. 248th ACS National Meeting, San Francisco, CA, August 10-14, 2014.
15. Workshop on In Situ Probes for Investigating Solar Energy Conversion, Brookhaven National Lab, May 20, 2014
16. SPIE DSS14 Micro-Nanotechnology Sensors, Systems, and Applications Conference, Baltimore, MD, May 5-9, 2014
17. American Vacuum Society Annual Conference, Long Beach, California, Oct. 27, 2013
18. Renewable Energy and the Environment Congress, Eindhoven, Netherlands, Nov. 2012
19. ARO 2D Materials Workshop, Ohio State University, Columbus, OH , Aug. 6, 2012,
20. Materials Challenge in Alternative & Renewable Energy, Clearwater, FL, Feb. 28, 2012
- 21.** ACM Chapter Meeting, North Carolina State University, Jan. 19, 2012