Rui Yang 杨睿

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POSITION OF INTEREST（职位目标）

Tenure-Track Assistant or Associate Professor in Emerging Nanoscale Devices and Integrated Systems – Nanoelectronics, Nanoelectromechanical Systems (NEMS) and Optoelectronic Devices

下一代纳米器件与集成系统——纳米电子，纳米机电系统及光电子器件方向的终身制职位的讲师或副教授（并准备在 1 或 2 年内申请上海市各类青年人才计划和国家“青年千人”项目）

EDUCATIONAL BACKGROUND（教育背景）

- **Ph.D. Candidate**, August 2011 – May 2016 (expected), Department of Electrical Engineering & Computer Science, Case Western Reserve University, Cleveland, Ohio, USA.
  Advisor: Prof. Philip Feng. GPA: 3.83/4.0.
  博士生在读，2011 年 8 月至 2016 年 5 月（预期），电子工程与计算机科学系，凯斯西储大学，克里夫兰，俄亥俄州，美国
  导师：Philip Feng 教授。成绩：3.83/4.0
- **B.E.**, September 2007-July 2011, Measurement and Control Technology and Instrument, Tianjin University, China.
  本科(工学学士)，2007 年 9 月-2011 年 7 月, 测控技术与仪器专业，天津大学，中国

RESEARCH AREAS & INTERESTS（研究领域及兴趣）

- New Types of Transistors, Resonators, Thermoelectric and Optoelectronic Devices based on Two-Dimensional (2D) Semiconducting Crystals (*e.g.*, MoS_2, WSe_2 and Black Phosphorus)
  基于二维半导体材料（例如二硫化钼、二硒化钨、黑磷）的新型晶体管，谐振器，热电与光电器件
- Resonant Micro/Nano-electromechanical Systems (MEMS & NEMS), for Vibrational Energy-Harvesting, RF/Microwave Devices and Flexible Sensors and Transducers
  用于振动能量采集，射频/微波器件与柔性传感器的谐振微/纳机电系统
- Nanoelectromechanical Logic Devices based on Silicon Nanowires and Silicon Carbide (SiC) for Beyond-CMOS Ultralow-Power Computing
  超越现有互补金属氧化物半导体技术的基于硅和碳化硅纳米线并可用于超低功耗计算的纳米机电逻辑器件

SUMMARY OF SCHOLARLY ACTIVITIES & ACHIEVEMENTS（学术活动成果总结）

- H-index 6; ~84 Total Citations (Google Scholar) [As of November 19, 2015]
  H-index 6;总引用数约 84 次（谷歌学术）[2015 年 11 月 19 日更新]
- 10 Peer-Reviewed Journal Publications
  10 篇同行审阅的期刊文章 (3 篇 *Nanoscale*;1 篇 *Appl. Phys. Lett.*;1 篇 *JMM*;2 篇 *JVST-B*;1 篇 *Diam. Relat. Mater.*;1 篇 *ACS Appl. Mater. Interfaces*;1 篇 *Plasma Chem. Plasma Process.*)
- 16 Peer-Reviewed International Conference Publications
  16 篇同行审阅的国际会议文章 (2 篇 *IEDM*;5 篇 *IEEE MEMS*;1 篇 *Transducers*;4 篇 *IEEE IFCS*;1 篇 *IEEE NANO*;1 篇 *IEEE NEMS*;1 篇 DATE;1 篇 *ASME InterPACK*)

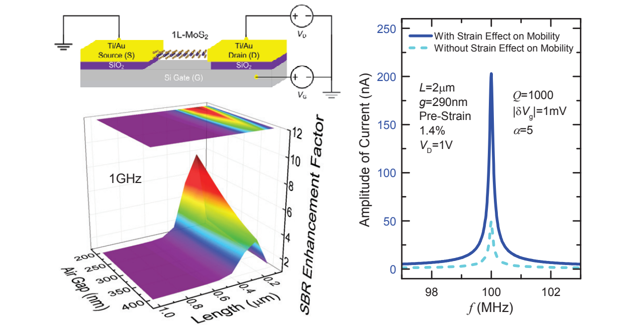
- ❑ 1 Invited Short Course Lecture

  1 个受邀请的短课程

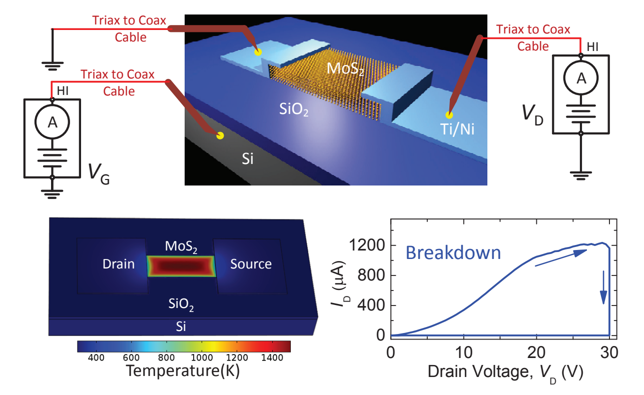
- ❑ 4 High School and Undergraduate Students Mentored

  指导了 4 名高中和本科的学生

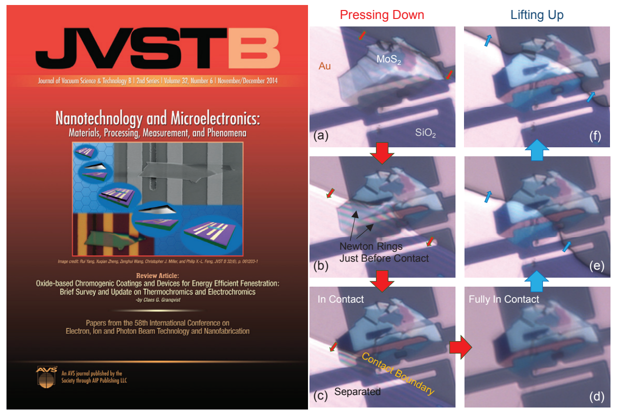
PEER-REVIEWED JOURNAL PUBLICATIONS（经过同行审阅的期刊发表的文章）



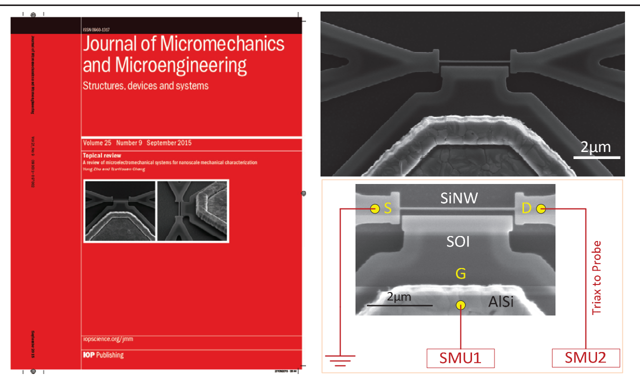
1. **R. Yang**, A. Islam, P. X.-L. Feng, "Electromechanical Coupling and Design Considerations in Single-Layer MoS_2 Suspended-Channel Transistors and Resonators", *Nanoscale*, DOI: 10.1039/C5NR06118K (2015).
(JCR一区, IF:7.394)
http://pubs.rsc.org/en/content/articlelanding/2015/nr/c5nr06118k#!divAbstract



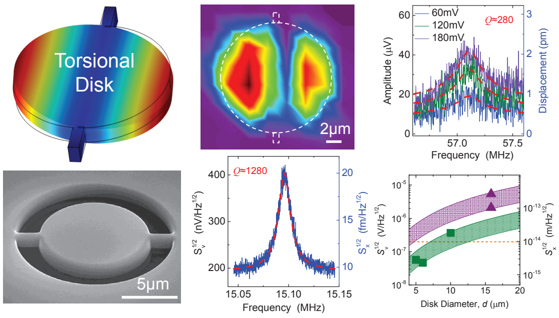
2. **R. Yang**, Z. Wang, P. X.-L. Feng, "Electrical Breakdown of Multilayer MoS_2 Field-Effect Transistors with Thickness-Dependent Mobility", *Nanoscale* **6**, 12383-12390 (2014).
(JCR一区, IF:7.394)
http://pubs.rsc.org/en/Content/ArticleLanding/2014/NR/C4NR03472D#!divAbstract



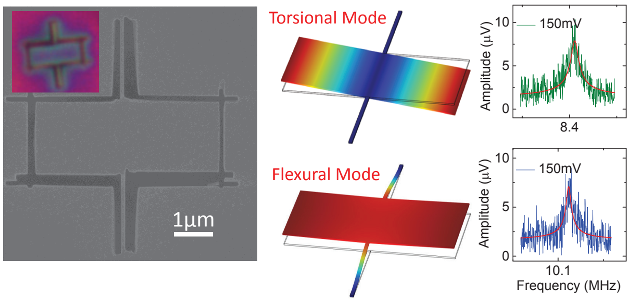
3. **R. Yang**[†], X. Zheng[†], Z. Wang, P. X.-L. Feng, "Multilayer MoS_2 Transistors Enabled by a Facile Dry-Transfer Technique and Thermal Annealing", *Journal of Vacuum Science and Technology B* **32**, 061203 (2014). [†]Equal Contribution. (*Featured as Cover Article, Editor's Pick and Most Read Article*)
(JCR三区, IF:1.464)
http://scitation.aip.org/content/avs/journal/jvstb/32/6/10.1116/1.4898117



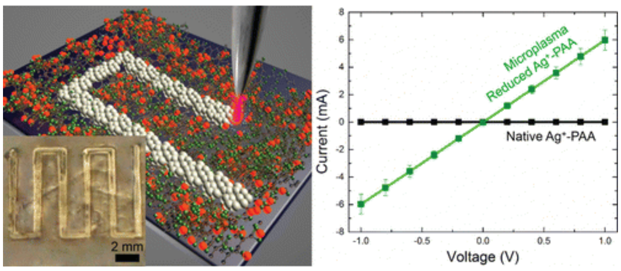
4. **R. Yang**, T. He, M. A. Tupta, C. Marcoux, P. Andreucci, L. Duraffourg, P. X.-L. Feng, "Probing Contact-Mode Characteristics of Silicon Nanowire Electromechanical Systems with Embedded Piezoresistive Transducers", *Journal of Micromechanics and Microengineering* **25**, 095014 (2015). (*Featured as Cover Article*)
(JCR二区, IF:1.731)
http://iopscience.iop.org/0960-1317/25/9/095014/



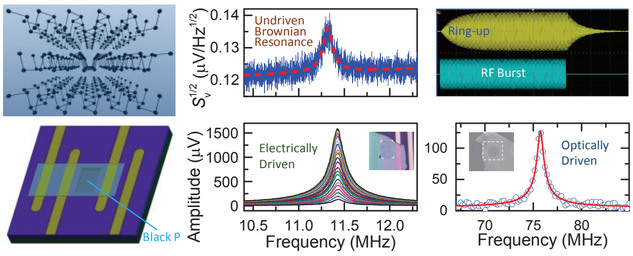
5. **R. Yang**, Z. Wang, J. Lee, K. Ladhane, D. J. Young, P. X.-L. Feng, "6H-SiC Microdisk Torsional Resonators in a "Smart-cut" Technology", *Applied Physics Letters* **104**, 091906 (2014).
(JCR二区, IF:3.302)
http://scitation.aip.org/content/aip/journal/apl/104/9/10.1063/1.4867866



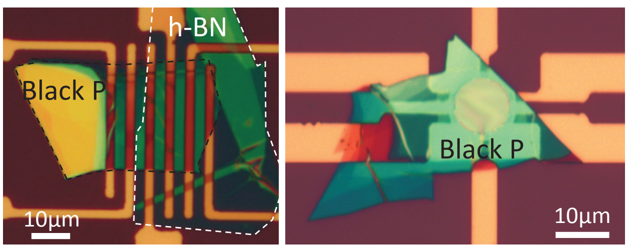
6. **R. Yang**, C. A. Zorman, P. X.-L. Feng, "High Frequency Torsional-Mode Nanomechanical Resonators Enabled by Very Thin Nanocrystalline Diamond Diaphragms", *Diamond and Related Materials* **54**, 19-25 (2015).
(JCR三区, IF:1.919)
http://www.sciencedirect.com/science/article/pii/S0925963514002313



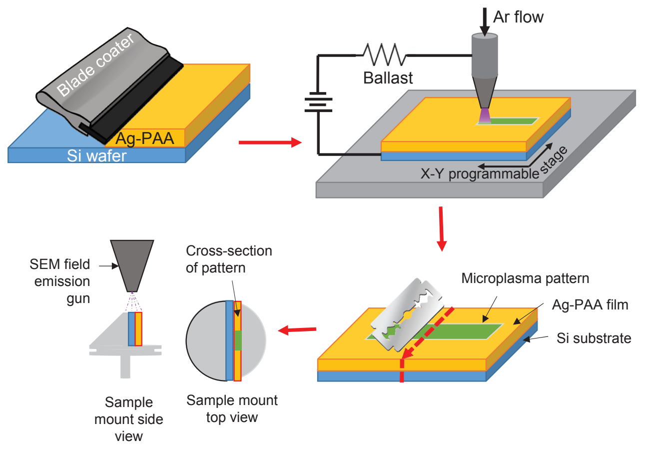
7. S. Ghosh, **R. Yang**, M. Kaumeyer, C. A. Zorman, S. J. Rowan, P. X. L. Feng, R. M. Sankaran, "Fabrication of Electrically-Conductive Metal Patterns at the Surface of Polymer Films by Microplasma-Based Direct Writing", *ACS Applied Materials and Interfaces* **6**, 3099-3104 (2014).
(JCR一区, IF:6.723)
http://pubs.acs.org/doi/abs/10.1021/am406005a



8. Z. Wang, H. Jia, X. Zheng, **R. Yang**, G. J. Ye, X. H. Chen, J. Shan, P. X.-L. Feng, "Black Phosphorus Nanoelectromechanical Resonators Vibrating at Very High Frequencies", *Nanoscale* **7**, 877-884 (2015).
(JCR一区, IF:7.394)
http://pubs.rsc.org/en/Content/ArticleLanding/2015/NR/C4NR04829F#!divAbstract



9. Z. Wang, A. Islam, **R. Yang**, X. Zheng, P. X.-L. Feng, "Environmental, Thermal, and Electrical Susceptibility of Black Phosphorus Field Effect Transistors", *Journal of Vacuum Science and Technology B* **33**, 052202 (2015). (*Featured as Cover Article, Editor's Pick and Most Read Article*)
(JCR三区, IF:1.464)
http://scitation.aip.org/content/avs/journal/jvstb/33/5/10.1116/1.4927371



10. S. Ghosh, E. Ostrowski, **R. Yang**, D. Debnath, P. X.-L. Feng, C. A. Zorman, R. M. Sankaran, "Atmospheric-Pressure Plasma Reduction of Metal Cation-Containing Polymer Films to Produce Electrically Conductive Nanocomposites by an Electrodiffusion Mechanism", *Plasma Chemistry and Plasma Processing*, DOI: 10.1007/s11090-015-9665-2 (2015).
(JCR三区, IF:2.056)
http://link.springer.com/article/10.1007%2Fs11090-015-9665-2

PEER-REVIEWED CONFERENCE PUBLICATIONS（经过同行审阅的国际会议的文章）

均发表在领域内IEEE顶级学术会议（包括IEDM, MEMS, Transducers等）和IEEE相关协会旗舰会议

（2 篇 IEDM;5 篇 IEEE MEMS;1 篇 Transducers;4 篇 IEEE IFCS;1 篇 IEEE NANO;1 篇 InterPACK;1篇IEEE NEMS;1篇DATE）

1. **R. Yang**, Z. Wang, P. X.-L. Feng, "All-Electrical Readout and Tuning of Atomically Thin MoS_2 Nanoelectromechanical Resonators in the VHF Band", in *29th IEEE Int. Conf. on Micro Electro Mechanical Systems (**MEMS 2016**)*, Paper No. 0556, *Accepted*. (+talk, selection rate 8%)
2. **R. Yang**, M. A. Tupta, C. Marcoux, P. Andreucci, L. Duraffourg, P. X.-L. Feng, "Capacitance-Voltage (*C-V*) Characterization in Very Thin *Suspended* Silicon Nanowires for NEMS-CMOS Integration in 160nm Silicon-on-Insulator (SOI)", in *Proc. IEEE Int. Conf. on Nanotechnology (IEEE NANO 2015)*, Paper No. 707 (4 pages), Rome, Italy, July 27-30 (2015).
3. **R. Yang**, Z. Li, P. X.-L. Feng, "Molybdenum Disulfide (MoS_2) Nanomechanical Resonators Integrated on Microchannels", in *Proc. ASME InterPACK 2015 & ICNMM 2015*, Paper No. 48590 (4 pages), San Francisco, CA, July 6-9 (2015).
4. **R. Yang**, Z. Wang, P. X.-L. Feng, "Calibrating Temperature Coefficient of Frequency (TC*f*) and Thermal Expansion Coefficient (α) of MoS_2 Nanomechanical Resonators", in *Proc. IEEE Int. Frequency Control Symposium & European Frequency and Time Forum (IFCS-EFTF 2015)* 198-201, Denver, CO, April 12-16 (2015).
5. **R. Yang**, Z. Wang, P. Wang, R. Lujan, T. N. Ng, P. X.-L. Feng, "Two-Dimensional MoS_2 Nanomechanical Resonators Freely-Suspended on Microtrenches on Flexible Substrate", in *Proc. 28th IEEE Int. Conf. on Micro Electro Mechanical Systems (**MEMS 2015**)* 877-880, Estoril, Portugal, Jan. 18-22 (2015).
6. **R. Yang**, Z. Wang, J. Lee, K. Ladhane, D. J. Young, P. X.-L. Feng, "Temperature Dependence of Torsional and Flexural Modes in 6H-SiC Microdisk Resonators", in *Proc. IEEE Int. Frequency Control Symposium (IFCS 2014)* 618-620, Taipei, Taiwan, May 19-22 (2014).
7. **R. Yang**, K. Ladhane, Z. Wang, J. Lee, D. J. Young, P. X.-L. Feng, "Smart-Cut 6H-Silicon Carbide (SiC) Microdisk Torsional Resonators with Sensitive Photon Radiation Detection", in *Proc. 27th IEEE Int. Conf. on Micro Electro Mechanical Systems (**MEMS 2014**)* 793-796, San Francisco, CA, Jan. 26-30 (2014).
8. **R. Yang**, T. He, C. Marcoux, P. Andreucci, L. Duraffourg, P. X.-L. Feng, "Silicon Nanowire and Cantilever Electromechanical Switches with Integrated Piezoresistive Transducers", in *Proc. 26th IEEE Int. Conf. on Micro Electro Mechanical Systems (**MEMS 2013**)* 229-232, Taipei, Taiwan, Jan. 20-24 (2013). (+talk, selection rate 8%).

9. **R. Yang**, J. Lee, Z. Wang, P. X.-L. Feng, "Multimode Characteristics in Mechanically-Coupled Silicon Carbide (SiC) Nanowire Array Resonators", in *Proc. IEEE Int. Frequency Control Symposium (IFCS 2013)* 145-148, Prague, Jul. 21-25 (2013).
10. Z. Wang, **R. Yang**, A. Islam, P. X.-L. Feng, "Observation of Strong Temperature Hysteresis in Molybdenum Disulfide (MoS_2) Vibrating Nanomechanical Resonators", in *Proc. IEEE Int. Frequency Control Symposium & European Frequency and Time Forum (IFCS-EFTF 2015)* 783-786, Denver, CO, April 12-16 (2015).
11. [Invited Paper] P. X.-L. Feng, Z. Wang, J. Lee, **R. Yang**, X. Zheng, K. He, J. Shan, "Two-Dimensional Nanoelectromechanical Systems (2D NEMS) via Atomically-Thin Semiconducting Crystals Vibrating at Radio Frequencies", in *Tech. Digest, Int. Electron Devices Meeting (**IEDM 2014**)*, pp. 8.1.1-8.1.4, San Francisco, CA, Dec. 15-17 (2014).
12. [Invited Paper] S. Bhunia, V. Ranganathan, T. He, S. Rajgopal, **R. Yang**, M. Mehregany, P. X.-L. Feng, "Toward Ultralow-Power Computing at Extreme with Silicon Carbide (SiC) Nanoelectromechanical Logic", in *Proc. Design, Automation and Test in Europe Conference and Exhibition (**DATE 2014**)* 1-6, Dresden, Germany, Mar. 24-28 (2014).
13. T. He, **R. Yang**, V. Ranganathan, S. Rajgopal, M. A. Tupta, S. Bhunia, M. Mehregany, P. X.-L. Feng, "Silicon Carbide (SiC) Nanoelectromechanical Switches and Logic Gates with Long Cycles and Robust Performance in Ambient Air and at High Temperature", in *Tech. Digest, Int. Electron Devices Meeting (**IEDM 2013**)*, Paper No. 4.6, 108-111, Washington DC, Dec. 9-11 (2013).
14. T. He, V. Ranganathan, **R. Yang**, S. Rajgopal, S. Bhunia, M. Mehregany, P. X.-L. Feng, "Time-Domain AC Characterization of Silicon Carbide (SiC) Nanoelectromechanical Switches toward High Speed Operations", in *Tech. Digest, 17th Int. Conf. on Solid-State Sensors, Actuators and Microsystems (**Transducers 2013**)* 669-672, Barcelona, Spain, Jun. 16-20 (2013).
15. T. He, **R. Yang**, S. Rajgopal, S. Bhunia, M. Mehregany, P. X.-L. Feng, "Dual-Gate Silicon Carbide (SiC) Lateral Nanoelectromechanical Switches", in *Proc. 8th IEEE Int. Conf. on Nano/Micro Engineered and Molecular Systems (NEMS 2013)* 554-557, Suzhou, China, Apr. 7-10 (2013). (*Winner*, *Best Student Paper Award*)
16. T. He, **R. Yang**, S. Rajgopal, M. A. Tupta, S. Bhunia, M. Mehregany, P. X.-L. Feng, "Robust Silicon Carbide (SiC) Nanoelectromechanical Switches with Long Cycles in Ambient and High Temperature Conditions", in *Proc. 26th IEEE Int. Conf. on Micro Electro Mechanical Systems (**MEMS 2013**)* 516-519, Taipei, Taiwan, Jan. 20-24 (2013).

INVITED SPEECHES（受邀请的演讲）

- ***Invited Short Course Lecture***, *2015 IEEE SOI-3D-Subthreshold Microelectronics Technology Unified Conference (IEEE S3S 2015)*, "SOI Nanoelectromechanical Systems (NEMS) VLSI for 'More Than Moore' Applications", Rohnert Park, CA, Oct. 5-8 (2015).

OTHER CONFERENCE PRESENTATIONS（其他的会议演讲）

- Oral Presentation, *AVS 61st International Symposium and Exhibition*, "Sub-100nm Thin Polycrystalline Diamond Nanomechanical Torsional Resonators", and "Electrical Breakdown and Current Carrying Ability of Multilayer MoS_2 Transistors", Baltimore, MD, Nov. 9-14 (2014).
- Oral Presentation, *New Diamond and Nano Carbons Conference (NDNC 2014)*, "High Frequency Torsional-Mode Nanomechanical Resonators in Sub-100nm Thin Polycrystalline Diamond", Chicago, IL, May 25-29 (2014).

RESEARCH EXPERIENCE（科研经历）

Case Western Reserve University, 2011-Present, Advisor: Prof. Philip Feng
凯斯西储大学，2011年至今，指导教师：Philip Feng教授

- "Experimental Demonstration of Electrical Readout and Tuning of Atomically Thin MoS_2 Nanoelectromechanical

Resonators” 2014-Present
原子层厚度的二硫化钼纳米机电谐振器的电学读出和频率调谐的实验，2014年至今
I demonstrate the first single-, bi-, and tri-layer MoS_2 NEMS resonators with all-electrical signal transduction. These atomically thin MoS_2 membranes, suspended on circular microtrenches, form vibrating-channel transistors (VCTs). I first identify thin MoS_2 flakes by optical contrast, and then examine the flakes using photoluminescence (PL) and Raman spectroscopy. The devices are measured using down-mixing techniques with frequency modulation (FM), showing resonance frequency in the very high frequency (VHF) band, plus clear tunability of resonance by varying gate voltage. As a first demonstration of application for these MoS_2 VCTs, I use the devices for resonant detection of photons at different wavelengths.

- “Designing Electromechanically Coupled Single-Layer MoS_2 Suspended-Channel Transistors and Resonators”, 2014-Present
  机电耦合的单层二硫化钼悬浮通道晶体管和谐振器的设计，2014年至今
  For the suspended doubly-clamped single-layer MoS_2 devices, I find that in DC gating scenario, signal transduction processes including electrostatic actuation, deflection, straining on bandgap, mobility, carrier density and their cross-interactions are intricate, and I use self-consistent calculation in MATLAB to solve it. I show that the straining effect on enhancing mobility increases the DC conductance and offers better signal-to-background ratio (SBR) in AC gating scenario (using 100MHz and 1GHz devices as relevant targets). I also show dependence of signal intensity and on device geometries and scaling effects, with SBR enhancement by a factor of ~8 for resonance signal, which provide guidelines toward designing future devices with desirable parameters.

- “MoS_2 Nanomechanical Resonators Freely-Suspended on Microtrenches on Flexible Substrate Characterized by Specially-Engineered Ultrasensitive Optical Interferometry”, 2014-Present
  用特殊设计的超灵敏光学干涉方法测量悬浮在柔性基底表面微沟道的二硫化钼纳米机械谐振器，2014年至今
  With the PDMS substrate with microtrenches, I transfer MoS_2 flakes onto the microtrenches, and measure the mechanical resonance of these devices with a specially engineered multi-laser interferometric detection system. I also perform bending experiments on these NEMS resonators, and find that they can sustain large amount of bending and stretching without failure.

- “Molybdenum Disulphide (MoS_2) Field-Effect Transistors (FETs) and Resonators based on Dry-Transfer Method”, 2014-Present
  用干法转移的方式制备的二硫化钼场效应管和谐振器，2014年至今
  MoS_2 FETs are fabricated using a facile, completely-dry, transfer technique, which avoids any post-transfer lithographical and chemical processes. I perform vacuum thermal annealing to boost the device performance, achieving field-effect mobility up to $76cm^2/(V\cdot s)$ and on/off ratios exceeding 10^7. I then perform electrical measurements with high-precision source measurement units (SMUs) using semiconductor parameter analyzer (Keithley 4200 SCS) and a probe station. This dry-transfer method is readily applicable to fabricate FETs and resonators based on other 2D materials and nanomechanical resonators.

- “Electrical Breakdown of Multilayer MoS_2 FETs with Thickness-Dependent Mobility”, 2013-2014
  电子迁移率随厚度变化的多层二硫化钼场效应管的电击穿效应，2013-2014年
  I fabricate MoS_2 FETs using mechanical exfoliation, followed by electron-beam lithography, metal evaporation and lift-off. I measure the device thickness with atomic force microscope (AFM). I measure the transport and transfer characteristics of the devices with SMUs, which show an interesting thickness dependence of mobility, and I explain the effect with an analytical model. I perform electrical breakdown measurements, and use finite element modeling (FEM, using COMSOL) to simulate the Joule heating and heat transfer in the device. I show that the multilayer MoS_2 FETs could have better current-carrying capability than monolayer FETs.

- “Thermomechanical and Driven Resonances of 6H-Silicon Carbide (SiC), 3C-SiC, and Nanocrystalline Diamond Nanomechanical Resonators Measured by Optical Interferometry”, 2013-2015
  光学干涉方法测量的6H型和3C型碳化硅，以及纳米晶体结构的金刚石谐振器的自发布朗运动和受迫振动，2013年-2015年
  I fabricate torsional resonators based on 6H-SiC and nanocrystalline diamond films, and NEMS array resonators on 3C-SiC films, by using high-resolution focused ion beam (FIB), and chemical processes such as buffered oxide etching (BOE). I measure the devices with laser interferometry, and for some devices I perform spatial mapping to get the mode shape and I do temperature-dependent measurement on some devices to calibrate the temperature coefficient of frequency (TC*f*).
- “NEMS Switches based on SiC and Silicon Nanowires (SiNWs)”, 2011-2013
  基于碳化硅和硅纳米线的纳米机电开关，2011-2013年
  I measure SiNW NEMS switches in contact-mode with SMUs, and the nanocontact can be monitored by the integrated piezoresistive transducers. I also help on the measurement, analytical modeling and FEM simulation for the SiC NEMS switches. The SiC NEMS switches with cantilever structure and motional volume of only ~1μm^3 have operated in ambient condition for more than 10^7 cycles of ‘hot-switching’ without failure.
- “Scalable Nanomanufacturing of Conductive Metal Patterns with Atmosphere-Pressure Microplasma”, 2012-Present
  使用大气压强下的微等离子体制备的金属导体样品的一种可扩展的纳米加工方法，2012年至今
  I perform electrical conductivity measurement on the metal lines patterned by atmosphere-pressure Ar DC microplasma. We get sheet resistance of 1 to 10Ω/sq at the surface of the poly (acrylic acid) film, with line width of ~300μm. I use COMSOL to simulate the generation and transport of microplasma using parameters similar to the measurement system, which is used in a winning NSF proposal. I am also working on using FIB to pattern stencil masks with small feature sizes to enable scaling down of the structures we can pattern.

INVENSION DISCLOSURE（呈报的发明）

R. Yang, T. He, P. X.-L. Feng, “Integrating Piezoresistive Nanowires For Sensing And Monitoring Contact-Mode Nanoelectromechanical Switches”, Case No. 2014-2612, Technology Transfer Office, Case Western Reserve University, Cleveland, Ohio 44106, USA, Nov. 2013.

TEACHING & MENTORING EXPERIENCE（教学和指导学生的经历）

- Mentoring 2 undergraduate students, both from Case Western Reserve University, for more than half year, as their senior projects. Student names: Jonathan McCandless (EE, 2014-2015), Vipul Malik (Physics, 2014-2015).
  指导 2 名凯斯西储大学的本科学生 Jonathan McCandless 和 Vipul Malik，各半年多(2014-2015 年)
- Mentoring 2 high school students from Hawken high school in Ohio, each for whole summer of 2 months. Student names: Alexandar Amin (2014), Daniel Weiss (2013).
  指导 2 名来自俄亥俄州 Hawken 高中的高中生，两个夏天分别指导了两名学生：Alexandar Amin (2014 年), 和 Daniel Weiss (2013 年)
- Teaching Assistant in EECS Department, Case Western Reserve University, for three courses:
  EECS 245, Electronic Circuits (2013);
  EECS 321, Semiconductor Electronic Devices (2014);
  EECS 422, Solid State Electronics II (2015).
  凯斯西储大学电气工程与计算机科学系助教，三门课程的名称分别是：
  EECS 245 电子电路(2013 年)；
  EECS 321 半导体电子器件(2014 年)；

EECS 422 固态电子学 II(2015 年)

REVIEWER EXPERIENCE（审稿经验）

- Independent reviewer for journal: *Nanotechnology*
  杂志 *Nanotechnology* 的独立审稿人
- Joint reviewer for a number of high-impact multidisciplinary journals and IEEE flagship journals, including: *Nano Letters, Nanotechnology, Journal of Vacuum Science and Technology B (JVST B), Nanoscale, IEEE Journal on Emerging and Selected Topics in Circuits and Systems (JETCAS), IEEE Transactions on Ultrasonics, Ferroelectrics, and Frequency Control (TUFFC)*
  多个高影响力的多学科的学术期刊和 IEEE 的旗舰杂志的联合审稿人

HONORS & AWARDS（获奖情况）

Winner of the Ruth Barber Moon Award, from School of Graduate Studies in Case Western Reserve University, for excellence in academic promise and leadership ability, April 2015. (Single Recipient from Case School of Engineering, Each Year 1 Winner in Each School of the Entire University)

2015 年 4 月赢得凯斯西储大学研究生院颁发的 Ruth Barber Moon 奖, 用来奖励学术上的潜力和领导能力(凯斯工学院唯一获奖者，整个大学的每所学院每年仅有一名获奖者)

PROFESSIONAL MEMBERSHIPS（专业组织的成员）

- Institute of Electrical and Electronics Engineering (IEEE), Student Member
  美国电气和电子工程师协会，学生成员
- IEEE Ultrasonics, Ferroelectrics, and Frequency Control Society (IEEE-UFFC), Student Member
  美国电气和电子工程师协会超声，铁电体，和频率控制协会，学生成员
- IEEE Electron Devices Society (IEEE-EDS), Student Member
  美国电气和电子工程师协会电子器件协会，学生成员
- American Vacuum Society (AVS), Student Member
  美国真空协会，学生成员

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