

# Li TAO

Visa Status: U.S. Permanent Resident

10100 Burnet Road, Bldg 160, Austin, TX 78758; [tao@utexas.edu](mailto:tao@utexas.edu); 214-533-5622 (c), 512-471-5582 (o)

## ACADEMIC BACKGROUND

- ❖ The University of Texas at Austin Research Associate in 2D Materials/Devices 2012-present
- The University of Texas at Austin Postdoctoral Fellow in Electrical Engineering 2010-2012
- ❖ The University of Texas at Dallas Ph.D. in Materials Science & Engineering Aug. 2010
- ❖ Southeast University, Nanjing, China Bachelor in Materials Science & Engineering June 2004

## RESEARCH EXPERTISE AND HIGHLIGHTS

- ❖ Interdisciplinary research expertise in material science, electrical engineering and nanotechnology
- ❖ Over 3 years of research experience in 2D materials, devices and flexible micro/nano-systems
  - *Debut of silicene field-effect transistors.* [*Nature Nanotechnology*], Feb. 2015  
(Highlighted by [Nature News](#), [Time Magazine Blog](#), [MIT Tech review](#) and decades of tech media)
  - *Flexible graphene transistor breaks new records.*[IDEM 2012] [best of 2012 tech updates](#)  
(Invited article in IEEE-nano magazine, coming in Sept. issue 2015)
  - *Wafer-scale CVD of graphene on evaporated Cu film* [*ACS Nano 2012*] ([News & Highlights](#))
- ❖ Over 6 years of research experience in cleanroom fabrication, nanomaterials characterization
  - *Pioneer work in revealing shape-effect of nanocarriers on the efficacy of nanomedicine*  
(Delivered an *invited review* and secured \$400k funding)
  - *Diamond-like carbon nanoimprint template.* [Peer's pick](#) as pioneer work, [top 20 download in 2006-12](#)
- ❖ Experienced in leading team-work research projects and technical writing for research grants

## PROFESSIONAL SERVICES

- ❖ Grant Proposal Reviewer for Kentucky Science & Engineering Foundation 2015
- ❖ Reviewer Panel of IEEE Nano: Microelectronics and Nanomaterials 2014-present
- ❖ Program Committee Member for EIPBN (3-beam conference) 2012-present
- ❖ Co- Session Chair in 2<sup>nd</sup> World Congress on Nano Science and Technology. Qingdao, China, 2012
- ❖ Invited peer review services from 16+ scholarly journals, including *J. Mater. Chem.*; *Nanotechnology*; *Carbon*; *Sensors and Actuators B*; *IEEE-Nano*, *IEEE-NEMS*

## HONORS, AWARDS AND MEDIA HIGHLIGHTS

- ❖ 2015: [Nature News](#), [Time Magazine Blog](#), [MIT Tech review](#): *Silicene Transistor Debut*
- ❖ 2012: [Nanotechweb.org: best of 2012 tech updates](#): *Flexible graphene transistor breaks new records*
- ❖ 2010: Inventor recognition award by UT Dallas (**1 of 3 student recipients**, the rest are faculties)
- ❖ 2010: Invited member to Golden Key International Honor Society (top 15 % graduates)
- ❖ 2009: Student travel support award by 53<sup>rd</sup> EIPBN (3-beam) conference, American Vacuum Society

## REFERENCES

- ❖ Prof. Deji Akinwande (UT Austin)
- ❖ Prof. Rodney S. Ruoff (UNIST, Korea)
- ❖ Prof. C. Grant Willson (UT Austin)
- ❖ Prof. Walter Hu (UT Dallas)
- ❖ Prof. Sanjay K. Banerjee (UT Austin)
- ❖ Prof. Yaling Liu (Lehigh University)

## SELECTIVE PUBLICATIONS

❖ **PEER-REVIEWED JOURNALS** Citations: ~500, h-index: 12 since 2010 by Google Scholar

[1] **L. Tao**, E. Cinquanta, D. Chappe, A. Molle, D. Akinwande, “Silicene Field-Effect Transistors at Room Temperature”, *Nature Nanotechnology*. **10**, 227-231 (2015)

{Highlighted by [Nature News](#), [MIT Tech review](#), [Time Magazine Blog](#) and decades of other tech media}

[2] S. Rahimi, **L. Tao**, *et al.*, “Towards 300mm Wafer-Scalable High-Performance Polycrystalline CVD Graphene Transistors”, *ACS Nano*, 2014, 8 (10), 10471–10479

[3] **L. Tao**, J. Lee, H. Li, R. Piner, R. S. Ruoff, D. Akinwande, “Inductively-heated synthesized graphene with record transistor mobility on oxidized silicon at room temperature”, *Appl. Phys. Lett.* 103 (18), 2013

[4] R. Piner, H. Li, X. Kong, **L. Tao**, *et al.*, “Graphene Synthesis via Magnetic Inductive Heating of Copper Substrates” *ACS Nano*, 2013, 7(9), 7495-7499

[5] X. Li,\* **L. Tao**,\* (*co-1<sup>st</sup> author*) *et al.*, “Direct Delamination of Graphene for High-Performance Plastic Electronics”, *Small* 10 (4) 2013

[6] H. Chang, S. Yang, J. Lee, **L. Tao**, *et al.*, “High-Performance, Highly Bendable MoS<sub>2</sub> Transistors with High-k Dielectrics for Flexible Low-Power Systems”, *ACS Nano*, 2013, 7 (6), 5446–5452

[7] **L. Tao**, J. Lee, H. Chou, M. Holt, R. S. Ruoff and D. Akinwande, “Synthesis of defect-free monolayer graphene at reduced temperature on hydrogen enriched evaporated copper (111) films” *ACS Nano*, 2012, 6 (3), 2319–2325. {*top 15 most read article in March 2012; ‘first time work’ regarded by online news*}

[8] **L. Tao**, J. Lee, M. Holt, H. Chou, *et al.*, “Uniform wafer-scale synthesis of graphene on evaporated Cu (111) film with quality comparable to exfoliated monolayer”, *J. Phys. Chem. C*, 116, 24068, 2012

[9] J. Lee, **L. Tao**, K. N. Parrish, Y. Hao, R. S. Ruoff, and D. Akinwande, “Multi-finger Flexible Graphene Field Effect Transistors with High Bendability”, *Appl. Phys. Lett.* 101, 252109, 2012

[10] **L. Tao**, J. Lee, D. Akinwande, “Nanofabrication down to 10 nm on a plastic substrate” *J. Vac. Sci. Technol. B*. 29, 06FG07, 2011.

[11] **L. Tao**, W. Hu, Y. Liu, G. Huang, B. D. Sumer and J. Gao, “Shape-specific polymeric nanoparticles for nanomedicine”, *Exp. Biol. Med.* 236 (1), 20-29, 2011 (**Invited Mini-Review Article**)

[12] **L. Tao**, X. Zhao, J. M. Gao and W. Hu, “Lithographically defined uniform worm-shaped polymeric nanoparticles”, *Nanotechnology* 21 (9), 095301, 2010.

[13] **L. Tao**, S. Ramachandran, C. T. Nelson, M. Lin, L. J. Overzet, *et al.*, “Durable diamond-like carbon templates for UV nanoimprint lithography,” *Nanotechnology* 19 (10), 105302, 2008.

[14] **L. Tao**, A. Crouch, F. Yoon, B. Lee, H. Hillebrenner *et al.*, “Induced patterning of organic and inorganic materials by spatially discrete surface energy,” *J. Vac. Sci. Technol. B*. 25 (6), 2007.

[15] S. Ramachandran, **L. Tao**, *et al.*, “Deposition and Patterning of Diamond-Like Carbon as Anti-Wear Nanoimprint Templates,” *JVST B*. 2993, 2006. {*cited as pioneer work, top 20 download in 2006-12*}

## ❖ INVITED BOOK CHAPTER

• **L. Tao**, D. Akinwande, Chapter 26 “Wafer-scale chemical vapor deposition of high quality graphene on evaporated Cu film” in *Graphene Science Handbook*, Vol.1 Fabrication Methods, CRC press, Taylor & Francis Group. (In press)

• **L. Tao**, D. Akinwande, “Fabrication and properties of silicene based ambipolar transistor” in *Silicene* by Springer press. (In writing)

### ❖ INVITED MAGAZINE ARTICLE

- “Large-Area Graphene Employed in Commercial Touchscreens, Flexible Electronics and Electrode for Neural Interfaces” *IEEE-nano magazine*, September Issue, 2015

### ❖ INVITED TALKS

1. “Nanoelectronics based on silicene”, 227<sup>th</sup> Electrochemical Society Meeting, Chicago, IL, May 2015
2. “Adventure with Graphene, Phosphorene and Silicene” National Institute of Standards and Technology (NIST), Gaithersburg, Maryland, May 2015
3. “Wafer-scale graphene synthesis and its application for flexible electronics”, 2<sup>nd</sup> Word Congress on Nano Science and Technology, Qingdao, China, 2012
4. “Lithographically Defined Shape-Specific Polymeric Nanomedicine”, 2<sup>nd</sup> Word Congress on Nano Science and Technology, Qingdao, China, 2012

### ❖ PEER REVIEWED CONFERENCE TALKS

- (1) “Encapsulated Integration of Silicene Field-Effect Transistors”, 59<sup>th</sup> *EIPBN (3-beam)*, Symposium 6B-2, May 29<sup>th</sup> 2015
- (2) “Single/Bi-Layer Silicene Devices and Air Stabilit”, *APS March Meeting*, Symposium L1-5, San Antonio, TX, March 4<sup>th</sup> 2015
- (3) “High performance graphene electronics enabled by new synthesis & transfer routes”, 58<sup>th</sup> *EIPBN (3-beam)*, Washington D.C., May 30<sup>th</sup> 2014
- (4) “Experimental Investigation on Silicene-Based Field-Effect Transistor”, *MRS Spring Conference*, Symposium NN4.07: 2D Materials and Devices beyond Graphene, San Francisco, CA, April, 2014.
- (5) “Graphene/Fluoropolymer Hybrid Materials with Enhancement of All Device Properties for Improved Field-Effect Transistors,” *IEEE IEDM*, 2013.
- (6) “Analog and digital flexible nanoelectronics fabricated from advanced 2D nanomaterials”, 57<sup>th</sup> *EIPBN (3-beam)*, Nashville, TN, May 2013.
- (7) “Wafer-scale, high performance CVD graphene devices”. *APS Marching Meeting*, J7-11, March 2013.
- (8) “Sub-20 nm directed self-assembly on plastics”, 56<sup>th</sup> *EIPBN (3-beam)*, Waikilowa, HI, May, 2012.
- (9) “Wafer-scale synthesis of high quality graphene on deposited hydrogen enriched Cu (111) film,” *IEEE International Semiconductor Device Research Symposium*, College Park, MD, Dec. 9, 2011.
- (10) “Nanofabrication down to 10 nm on plastics,” 55<sup>th</sup> *EIPBN (3-beam)*, Las Vegas, NV, May 30, 2011.
- (11) "Nanofabrication of Diamond-like Carbon Templates for Nanoimprint Lithography," *MRS Fall*, J13.4, Boston MA, Nov.27-Dec.1, 2006.

### ❖ PATENT DISCLOSURE

- “Integration of Air-Sensitive Two-Dimensional Materials on Arbitrary Substrates for The Manufacturing of Electronic Devices”, 22084-P128V1, 2015 (in application)
- “ Methods and Compositions Formed by Surface Energy Induced Patterning”, U.S. Provisional Patent Application #60/986,542, 2007