

Kun Wang

Assistant Professor

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EMPLOYMENT

- 2020 – Assistant Professor, Physics and Astronomy & Chemistry, **Mississippi State University** (Starkville, MS)
2017 – 2020 Research Fellow, Mechanical Engineering, **University of Michigan** (Ann Arbor, MI)

EDUCATION

- 2011 – 2016 Ph.D. in Physics, **University of Georgia** (Athens, GA)
2007 – 2011 B.S. in Physics and Microelectronics, **Shandong University** (Jinan, China)

SELECTED HONORS AND AWARDS

- 2016 *Nature Chemistry's Altmetric Top 10 for 2016* – Nature Chemistry
2016 *MRS Graduate Student Award (Highest honor to graduate students by MRS)* – Material Research Society (MRS)
2016 *Student Travel Award* – Graduate School, University of Georgia
2016 *Georgia-Liverpool Collaboration Research Award* – University of Georgia and University of Liverpool (UK)
2016 *Innovative and Interdisciplinary Research Award* – University of Georgia
2015 *Sean M. Kirkpatrick Award for Outstanding Research (One recipient per year)* – University of Georgia
2010 *Weichai Power Outstanding Student Award (Top 1%)* – Shandong University, China
2009 *Scholarship for Outstanding Student (Top 5%)* – Shandong University, China

PUBLICATIONS ([Google Scholar Profile](#))

Book Chapters:

1. **K Wang**, BQ Xu, “*Modulation and control of charge transport through single-molecule junctions*” in *Molecular-Scale Electronics*, Springer International Publishing, ISBN: 978-3-030-03305-7 (2019)
2. BQ Xu, **K Wang**, J Hamill, R Colvard, “*Modulate and control of detailed electron transport of single molecule*” *Molecular Electronics: An Experimental and Theoretical Approach*, Jenny Stanford Publishing, ISBN-10: 9814613908 (2015)

Peer-Reviewed Journal Articles (chronological order):

(* denotes equally contributed first-author)

1. H Wang, LP Zhou, Y Zheng **K Wang**, B Song X Yan, L Wojtas, XQ Wang, X Jiang, M Wang, Q Sun, B Xu, HB Yang, ACH Sue, YT Chan J.L. Sessler, Y Jiao, P. J. Stang X Li, “*Double-layered supramolecular prisms self - assembled by geometrically non-equivalent tetratopic subunits*”, *Angew. Chem. Int. Ed.* (Accepted) (2020)
2. H Reddy*, **K Wang***, Z Kudyshev, L Zhu, S Yan, A Vezzoli, S.J. Higgins, V Gavini, A Boltasseva, P Reddy, V.M. Shalaev, E Meyhofer, “*Determining plasmonic hot-carrier energy distributions via single-molecule transport measurements*” *Science* 369, 423-426 (2020) (* equal contribution)
 - Media coverage: *Science Daily*, *EurekAlert*, *Nanowerk*, *Phys.org*, *Solar Daily*, *Nanotechnology Now*, *Purdue News*, *Michigan News*, *Liverpool News*, *News Break*, *Bioengineering.org*, *SciTechDaily* etc.
3. Y An, Y Hou, **K Wang**, S Gong, C Ma, C Zhao, T Wang, Z Jiao, H Wang, R Wu, “*Multifunctional Lateral Transition-Metal Disulfides Heterojunctions*” *Advanced Functional Materials* (Accepted) (2020)
4. **K Wang**, E Meyhofer, P.R. Reddy, “*Thermal and thermoelectric properties of molecular junctions*” *Advanced Functional Materials* 30, 1904534 (2020)

5. H Wang, C Liu, **K Wang**, M Wang, H Yu, S Kandapal, R Brzozowski, B Xu, M Wang, S Lu, XQ Hao, P Eswara, MP Nieh, J Cai, X Li, “*Assembling pentatopic terpyridine ligand with three types of coordination moieties into giant supramolecular hexagonal prism: synthesis, self-assembly, characterization, and antimicrobial study*” [Journal of the American Chemical Society](#) 141, 40, 16108-16116 (2019)
6. **K Wang***, A Vezzoli*, I Grace*, M McLaughlin, RJ Nichols, B Xu, CJ Lambert, SJ Higgins, “*Charge transfer complexation boosts molecular conductance through Fermi level pinning*”, [Chemical Science](#) 10, 2396-2403 (2019)
7. Y An, J Jiao, Y Hou, H Wang, R Wu, C Liu, X Chen, T Wang, **K Wang**, “*Negative differential conductance nanodevices based on 2D ZrB₂ monolayers*” [Journal of Physics: Condensed Matters](#), 31, 065301 (2019)
8. R Miao, H Xu, M Skripnik, L Cui, **K Wang**, K Pedersen, M Leijnse, F Pauly, K Warnmark, E Meyhofer, P Reddy, H Linke, “*Influence of Quantum Interference on the Thermoelectric Properties of Molecular Junctions*”, [Nano Letters](#), 9, 5666-5672 (2018).
9. Y An, M Zhang, Y Sun, J Jiao, D Wu, T Wang, Z Fu, **K Wang**, “*Tuning the electronic structures and transport properties of zigzag blue phosphorene nanoribbons*”, [IEEE Transactions on Electron Devices](#), 10, 4646-4651 (2018).
10. H Wang, X Qian, **K Wang**, M Su, W Haoyang, X Jiang, R Brzozowski, M Wang, X Gao, Y Li, B Xu, P Eswara, X Hao, W Gao, J Hou, J Cai, X Li, “*Supramolecular Kandinsky Circles with High Antibacterial Activity*”, [Nature Communications](#), 9, 1815 (2018).
 - Highlighted in *Phys.Org* news
11. **K Wang**, “*DNA-Based Single-Molecule Electronics: From Concept to Function*”, [Journal of Functional Biomaterials](#), 9, 8. (2018).
 - Featured as journal *Front Cover*
12. J Zhou, **K Wang**, B Xu, Y Dubi, “*Photo-Conductance from Exciton Binding in Molecular Junctions*”, [Journal of the American Chemical Society](#), 140, 70-73 (2018).
13. L Cui, R Miao, **K Wang**, D Thompson, L Zotti, JC Cuevas, E Meyhofer, P Reddy, “*Peltier Cooling in Molecular Junctions*”, [Nature Nanotechnology](#), 13, 122-127 (2018).
 - Featured in *Nature Nanotechnology* News & Views: “*Peltier cooling at molecular scale*”
 - Featured in *Nature Nanotechnology* Editorial: “*A Cool Paper*”
 - Selected as *Nature Nanotechnology* Front Cover Art
14. **K Wang***, AK Ismael*, A Vezzoli*, HE Gallagher, IM Grace, CJ Lambert, B Xu, RJ Nichols and SJ Higgins, “*Side group-mediated mechanical conductance switching in molecular junctions*”, [Angew Chem Int Ed](#), 56, 15378-15382 (2017).
 - Highlighted in *UGA news*
15. Z Jiang, Y Li, B Song, **K Wang**, M Sun, D Liu, X Li, J Yuan, M Chen, Y Guo, X Yang, T Zhang, CN Moorefield, GR Newkome, B Xu, X Li, P Wang, “*Self-assembly of supramolecular pentagram and hexagram*”, [Nature Communications](#), 8, 15476 (2017).
 - Highlighted in *UGA news*
16. B Song, Z Zhang, **K Wang**, C-H Hsu, O Bolarinwa, J Wang, Y Li, G-Q Yin, E Rivera, J Cai, HB Yang, C Liu, B Xu, X Li, “*Direct Self-assembly of 2D and 3D Star of David*”, [Angewante Chemie](#), 56, 5258-5262 (2017).
17. **K Wang**, BQ Xu, “*Modulation and control of charge transport through single molecule junctions*”, [Topics in Current Chemistry](#), 375, 17 (2017).
18. M Zhang, Y An, Y Sun, D Wu, X Chen, T Wang, G Xu, **K Wang**, “*The electronic transport properties of zigzag phosphorenelike MX (M=Ge/Sn, X=S/Se) nanostructures*” [Physical Chemistry Chemical Physics](#), 19, 17210-17215 (2017).
19. Y An, Y Sun, J Jiao, M Zhang, **K Wang**, X Chen, D Wu, T Wang, Z Fu, Z Jiao “*The electronic transport properties of zigzag phosphorenelike MX (M=Ge/Sn, X=S/Se) nanostructures*”, *Organic Electronics*, 50, 43-47 (2017)
20. C Guo*, **K Wang***, E Zerah-Harush, J Hamill, B Wang, Y Dubi, BQ Xu, 2016 “*Molecular rectifier composed of DNA with high rectification ratio enabled by intercalation*”, [Nature Chemistry](#), 8, 484-490 (2016) (* equal contribution)
 - Web of Science highly cited paper
 - Ranked No. 3 in 2016 *Nature Chemistry's* Altmetric Top 10
 - Highlighted in more than 50 news worldwide including *Yahoo News, Science Daily, NSF News, Phys.Org* etc.

21. **K Wang** and BQ Xu, “*Electron tunneling through molecule-electrode contacts: experimental determination and a practical model*”, [Physical Chemistry Chemical Physics](#), 18, 9569-9576 (2016).
22. M Wang, **K Wang**, C Wang, M Huang, XQ Hao, MZ Shen, GQ Shi, Z Zhang, B Song, A Cisneros, MP Song, B Xu and X Li, “*Self-Assembly of Concentric Hexagons and Hierarchical Self-Assembly of Supramolecular Metal-Organic Nanoribbons (SMON) at Solid/Liquid Interface*”, [Journal of the American Chemical Society](#) 138, 9258–9268 (2016).
23. Y An, M Zhang, D Wu, Z Fu, **K Wang**, “*The electronic transport properties of transition-metal dichalcogenides lateral heterojunctions*”, [Journal of Material Chemistry C](#), 4, 10962-10966 (2016).
24. Y An, M Zhang, D Wu, T Wang, Z Jiao, C Xia, Z Fu, **K Wang**, “*The rectifying and negative differential resistance effects in heterojunctions of graphene/h-BN nanoribbons*”, [Physical Chemistry Chemical Physics](#), 18, 27976-27980 (2016).
25. Y An, M Zhang, D Wu, Z Fu, T Wang, Z Jiao, **K Wang**, “*The magnetism and spin-dependent electronic transport properties of boron nitride atomic chains*”, [Journal of Chemical Physics](#) 145, 144031 (2016).
 - Selected as journal *Front Cover*
26. A Vezzoli, I Grace, C Brooke, **K Wang**, CJ Lambert, BQ Xu, RJ Nichols and SJ Higgins, “*Gating of single molecule junction conductance by charge transfer complex formation*”, [Nanoscale](#), 7, 18949-18955 (2015).
27. Z Lou, B Wang, CL Guo, **K Wang**, HQ Zhang, BQ Xu, “*Molecular-level Insight of Early-stage Prion Protein Aggregation on Mica and Graphite Surface by AFM Imaging and Molecular Simulation*”, [Colloids and Surface B](#), 135, 371-378 (2015).
28. **K Wang**, J Hamill, JF Zhou, BQ Xu, “*Mapping the details of contact effect of modulated Au-octanedithiol-Au break junction by force-conductance cross-correlation*”, [Journal of the American Chemical Society](#) 136, 17406–17409 (2014)
29. **K Wang**, J Hamill, B Wang, CL Guo, S Jiang, Z Huang, BQ Xu, “*Structure determined charge transport in single DNA molecule break junctions*”, [Chemical Science](#), 5, 3425-3431 (2014)
30. **K Wang**, J Hamill, JF Zhou, CL Guo, BQ Xu, “*Measurement and control of detailed electronic properties of single molecule junction*”, [Faraday Discussions](#), 174, 91-104 (2014).
31. **K Wang**, JF Zhou, J Hamill, BQ Xu, “*Measurement and understanding of single molecule junction rectification caused by asymmetric contacts*”, [Journal of Chemical Physics](#), 141, 054712 (2014).
32. J Hamill, **K Wang**, BQ Xu, “*Force and conductance molecular junctions with time series cross-correlation*”, [Nanoscale](#), 6, 5657-5661 (2014).
33. J Hamill, **K Wang**, BQ Xu, “*Characterizing molecular junctions through mechanically controlled break junction approach*”, [Reports in Electrochemistry](#), 4: 1-11 (2014).

SELECTED ACADEMIC PRESENTATIONS

1. [Invited Talk] “*Mapping Plasmonic Hot Carriers via Single Molecule Transport Measurements*”
BioMolecular Electronics Colloquia, University of Liverpool Nov 5, 2020
2. [Invited Talk] “*Probing Optoelectronics, Energy Conversion and Nanosensing at the Molecular Scale*”
Chemical Engineering Seminar, Mississippi State University Sep 18, 2020
3. [Invited Talk] “*Controlling Quantum Transport at the Molecular Scale for Optoelectronics and Energy Applications*”
Physics-Chemistry Joint Departmental Colloquium, Mississippi State University Sep 11, 2020
4. [Invited Talk] “*Harnessing Molecular Quantum Transport for Optoelectronics, Energy Conversion and Nanosensing*”
Physics Colloquium, Virginia Commonwealth University, Richmond, VA Jan 21, 2020
5. [Invited Talk] “*Harnessing Molecular Quantum Transport for Optoelectronics, Energy Conversion and Nanosensing*”
Chemistry Seminar, Mississippi State University, Starkville, MS Jan 28, 2020
6. [Oral] “*Tuning DNA into molecular diode via structure modification*”
MRS Graduate Student Award Special Talk Session, Boston, MA Nov 29, 2016
7. [Oral] “*Tuning DNA into molecular diode with high rectification ratio through structure modification*”
Materials Research Society (MRS) Fall meeting, Boston, MA Nov 28, 2016

8. [Invited Talk] “*Modulation and control of charge transport through single molecule junctions*”
Sean M. Kirkpatrick Award Recipient Special Talk, University of Georgia, Athens, GA Nov 18, 2016
9. [Invited Talk] “*Modulation and Control of Charge Transport through Single-Molecule Junctions*”
Illumina - San Diego HQ, San Diego, CA Sep 12, 2016
10. [Invited Talk] “*Modulation and Control of Charge Transport through Single-Molecule Junctions*”
Nanoscale Transport Lab, University of Michigan, Ann Arbor, MI Sep 16, 2016
11. [Invited Talk] “*DNA molecular electronics: a way to probe the bottom*”
Department of Physics, Henan Normal University, Xinxiang, China Mar 22, 2016
12. [Oral] “*Single DNA molecular rectifier with high rectification ratio enabled by structure modification*”
Interdisciplinary Research Conference (IRC), University of Georgia, Athens, GA Feb 5, 2015

SELECTED MEDIA COVERAGE (>100 in total)

- “**Discovery unlocks 'hot' electrons for more efficient energy use**” featured in [*Science Daily*](#), [*EurekAlert*](#), [*Phys.org*](#), [*Nanowerk*](#), [*Purdue News*](#), [*NanotechnologyWorld*](#), [*Bioengineering.org*](#), [*SciTechDaily*](#),
- “**First measurement of electron energy distributions, could enable sustainable energy technologies**” featured in [*Michigan News*](#), [*Nanotechnology Now*](#), [*News Break*](#)
- “**Measuring ‘hot charge carriers’ in metal nanostructures**” featured [*Liverpool News*](#)
- “**Giant molecules shaped like Kandinsky circles are toxic to MRSA bacteria**” featured in [*Phys.Org*](#)
- “**Peltier Cooling at Molecular Scale**” featured in [*Nature Nanotechnology News & Views*](#)
- “**A Cool Paper**” featured in [*Nature Nanotechnology Editorial*](#)
- “**UGA Engineering researchers develop nanoscale on-off switch**” highlighted in [*UGA Engineering News*](#)
- “**Scientists develop new ‘bottom-up’ process for creating nanomaterials**” highlighted in [*UGA Engineering News*](#)
- “**UGA researchers use single molecule of DNA to create world’s smallest diode**” highlighted by [*NSF News*](#), [*UGA Today*](#), [*TECH TIMES*](#), [*Eurek Alert*](#), [*Innovation Report*](#), [*Nano Werk*](#), [*Technology Org*](#), [*Newswise*](#), [*SinaTech*](#)
- “**World’s smallest diode created**” highlighted by [*Science Daily*](#), [*Headlines&Global News*](#), [*Science 2.0*](#)
- “**Researchers Create World’s Smallest Diode**” highlighted by [*SCI NEWS*](#)
- “**Beyond silicon: Scientists craft a diode out of DNA**” highlighted by [*Yahoo News*](#),
- “**World’s smallest diode developed**” highlighted by [*PhysOrg*](#), [*The Economic Times*](#)
- “**World’s Smallest Diode Is Made of DNA**” highlighted by [*IEEE Spectrum*](#)
- “**World’s smallest diode paves way for molecular electronics**” highlighted by [*New Kerala*](#), [*The New Indian Express*](#)

ACADEMIC SERVICE AND ACTIVITIES

- **Member:** Graduate Program Committee, Dept. of Chemistry, Mississippi State University (2020~present)
- **Chair:** Library Resources Committee, Dept. of Physics and Astronomy, Mississippi State University (2020~present)
- **Member:** Seminar Committee, Physics and Astronomy, Mississippi State University (2020~present)
- **Faculty Mentor:** NSF REU program “Food, Energy and Water Security”, Mississippi State University (2020~present)
- **Guest Editor:** Special issue “Exploring Biological Interfaces at the Nanometer Scale” in *Scanning* (John Wiley & Sons - Hindawi) (2017)
- **Peer Reviewer:** *Nano Lett*, *J Phys Chem Lett*, *Nanoscale*, *Appl Phys Lett*, *Org Electron*, *IEEE Sens*, *Appl Nanosci*, *Nanoscale Res Lett*, etc.