1. General Information

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Affiliation: School of Electrical, Computer & Energy Engineering, Ira A. Fulton Schools of Engineering, Biodesign Center for Molecular Design & Biomimetics
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https://scholar.google.com/citations?user=lZp6Y6sAAAAJ&hl=en
https://www.ncbi.nlm.nih.gov/myncbi/browse/collection/52665108/

2. Working Experience

2016.2– Assistant Professor, Arizona State University

2015.1–2016.1 Research Assistant Professor, Arizona State University

2012.3–2014.12 Postdoctoral research scientist, IBM T.J. Watson research center

3. Education

2006–2011 Dept. Electrical Engineering, Princeton University Ph.D. (Jan, 2012)

2006-2008 Dept. Electrical Engineering, Princeton University Master of Arts (Sep, 2008)

2003-2006 Institute of Microelectronics, Tsinghua Univ. Master of Science (July, 2006)

1999-2003 Dept. Electronic Engineering, Tsinghua Univ. Bachelor of Engineering (July, 2003)

4. Research Interests

- Advanced nanomanufacturing techniques, particularly nanoimprint lithography, molecular assembly, and additive manufacturing.
- Metasurface nanophotonics and quantum optics.
- On-chip purification and optical detection of biomarkers (DNA, protein, exosome, small molecule metabolite) for liquid biopsy.
- Low-noise nanopore sensing of DNA and other molecules.

5. Current Research Support

(1) Title: Integrated Nanopillar-Nanochannel Fluidic Systems for Optimal Linearization and Controlled Manipulation of Long DNA Molecules
Source of Support: Roche Sequencing Solutions, Inc. Role: PI.
Award Amount: $ 480,000. Award Allocation: $ 480,000. Total Award Period Covered: 2/1/2016 - 7/31/2017.

(2) Title: Collaborative Research: Silicon Nano-Opto-Fluidics Enabled Multi-Dimensional, High-Throughput Molecular and Size Profiling of Exosomes
Source of Support: NSF. Role: PI.
Award Amount: $ 169,349. Award Allocation: $ 169,349. Total Award Period Covered: 7/1/2017-6/30/2020.

(3) Title: On-chip Metasurface Polarimeter Array for full Stokes Polarization Imaging
Source of Support: NSF. Role: co-PI.
Award Amount: $ 329,978. Award Allocation: $ 131,991. Total Award Period Covered: 8/1/2018-7/31/2021.

(4) Title: EAGER: Enabling Quantum Leap: Room temperature Quantum Logic operations Enabled by Quantum Emitter Arrays in 2D artificial Superlattices

Source of Support: NSF. Role: co-PI.
Award Amount: $ 295,046. Award Allocation: $ 88,514. Total Award Period Covered: 7/15/2018-6/30/2020.

(5) Title: CAREER: Integrated Optofluidic Chips towards Label-Free Detection of Exosomal MicroRNA Biomarkers
Source of Support: NSF. Role: PI.
Award Amount: $ 500,000. Award Allocation: $ 500,000. Total Award Period Covered: 7/1/2019-6/30/2024.

(6) Title: Photochemically Induced, Polymer-Assisted Deposition for 3D Printing of Micrometer-Wide and Nanometer-Thin Silver Structures
Source of Support: NSF. Role: PI.
Award Amount: $ 485,487. Award Allocation: $ 364,115. Total Award Period Covered: 1/1/2020-12/31/2022.

(7) Title: Polarimetry-Enhanced Imaging towards Autonomous Solar Field and Receiver Inspections
Source of Support: DOE: Office of Energy Efficiency and Renewable Energy (EERE).
Role: co-PI.
Award Amount: $ 1,984,722. Award Allocation: $ 595,416. Total Award Period Covered: 3/1/2020-2/28/2023.

(8) Title: NSF-BSF: Synchronous electro-optical DNA detection using low-noise dielectric nanopores on sapphire
Source of Support: NSF Role: PI.
Award Amount: $ 360,000. Award Allocation: $ 360,000. Total Award Period Covered: 6/30/2020-5/31/2023.

6. Book Chapters

(1) Mikhail A. Kats, Yu Yao, and **Chao Wang**, Plasmonics and Surface Plasmons. In *Encyclopedia of Plasma Technology*, Taylor and Francis Group: 2015.

7. Journal Publications ('_', Wang lab members; '*', corresponding author; '†' first authors for Publications at ASU)

(1) Pengkun Xia †, Jiawei Zuo, Pravin Paudel, Shinhyuk Choi, Xiahui Chen, Weisi Song, JongOne Im, and Chao Wang *, "Sapphire Nanopores for Low-Noise DNA Sensing," *BioRxiv,* 10.1101/2020.1103.1102.973826, 2020.

(2) Zhi Zhao †*, Jing Bai, Yu Yao, and Chao Wang*, "Printing Continuous Metal Structures via Polymer-Assisted Photochemical Deposition," *Materials Today,* doi.org/10.1016/j.mattod.2020.03.001.

(3) Zhi Zhao †, Chao Wang, Hao Yan *, and Yan Liu *, "Soft Robotics Programmed with Double Crosslinking DNA Hydrogels," *Advanced Functional Materials*, pp. 1905911, 2019.

(4) Jing Bai †, Chu Wang, Xiahui Chen, Ali Basiri, Chao Wang, and Yu Yao *, "On Chip-Integrated Plasmonic Flat Optics for Mid-Infrared Full-Stokes Polarization Detection," *Photonics Research*, vol. 7, pp. 1051-1060, 2019.

(5) Ali Basiri †, Xiahui Chen, Pouya Amrollahi, Jing Bai, Joe Carpenter, Zachary Holman, Chao Wang *, and Yu Yao *, "Nature-Inspired Chiral Metasurfaces for On-Chip Circularly Polarized Light Detection," *Light: Science & Applications,* vol. 8, pp. 78, 2019.

(6) Zhi Zhao †, Ninad Chamele, Michael Kozicki, Yu Yao, and Chao Wang *, "Photochemical Synthesis of Dendritic Silver Nano-particles for Anti-counterfeiting," *J. Mater. Chem. C*, 2019, vol. 7, pp. 6099-6104, 2019.

(7) Benjamin H. Wunsch, Sung-Cheol Kim, Stacey M. Gifford, Yann Astier, Chao Wang, Robert L. Bruce, Jyotica V. Patel, Elizabeth A. Duch, Simon Dawes, Gustavo Stolovitzky, and Joshua T.

Smith, "Gel-on-a-chip: continuous, velocity-dependent DNA separation using nanoscale lateral displacement", *Lab on a Chip,* vol. 19, pp. 1567-1578, 2019.

(8) Xiahui Chen †, Chu Wang, Yu Yao *, and Chao Wang *, "Plasmonic Vertically Coupled Complementary Antennas for Dual-Mode Infrared Molecule Sensing," *ACS Nano,* vol. 11, pp. 8034-8046, 2017.

(9) Chao Wang †*, Sung-Wook Nam †, John. M. Cotte, Christopher. V. Jahnes, Evan G. Colgan*, et al.*, "Wafer-Scale Integration of Sacrificial Nanofluidic Chips for Single DNA Molecule Detection and Manipulation," *Nature Communications,* vol. 8, pp. 14243, 2017.

(10) Benjamin H. Wunsch †, Joshua T. Smith, Stacey M. Gifford, Chao Wang, Markus Brink, Robert Bruce, Robert H. Austin, Gustavo Stolovitzky, and Yann Astier, "Nanoscale Lateral Displacement Arrays for Separation of Exosomes and Colloids Down to 20nm," *Nat. Nanotechnol.,* vol. 11, pp. 936–940, 2016.

(11) Chao Wang †*, Robert L. Bruce, Elizabeth A. Duch, Jyotica V. Patel, Joshua T. Smith, et al., "Hydrodynamics of Diamond-Shaped Gradient Nanopillar Arrays for Effective DNA Translocation into Nanochannels," *ACS Nano*, vol 9, pp. 1206-1218, 2015.

(12) Jingwei Bai, Deqiang Wang, Sung-wook Nam, Hongbo Peng, Robert Bruce, Lynne Gignac, Markus Brink, Ernst Kratschmer, Stephen Rossnagel, Philip Waggoner, Kathleen Reuter, Chao Wang, Yann Astier, Venkat Balagurusamy, Binquan Luan, Young Kwark, Eric A. Joseph, Michael A. Guillorn, stas Polonsky, Ajay Royyuru, Satyavolu Papa Rao, and Gustavo Stolovitzky, "Fabrication of sub-20 nm Nanopore Arrays in Membranes with Embedded Metal Electrodes at Wafer Scales," *Nanoscale*, vol 6, pp. 8900–8906, 2014.

(13) Binquan Luan, Chao Wang, Ajay Royyuru, and Gustavo Stolovitzky, "Controlling the motion of DNA in a nanochannel with transversal alternating electric voltages," *Nanotechnology*, vol 25, pp. 265101, 2014.

(14) Chao Wang, Qi Zhang, Yu Song, and Stephen Y. Chou, "Plasmonic Bar-Coupled Dots-on-Pillar Cavity Antenna with Dual Resonances for Infrared Absorption and Sensing: Performance and Nanoimprint Fabrication," *ACS Nano*, vol. 8, pp. 2618-2624, 2014.

(15) Chao Wang, Sung-wook Nam, John M. Cotte, et al., "200 mm Wafer-Scale Integration of Sub-20 nm Sacrificial Nanofluidic Channels for Manipulating and Imaging Single DNA Molecules," In proceeding of *IEEE International Electron Devices Meeting (IEDM)*, 2013.

(16) Chao Wang and Stephen Y. Chou, "Integration of metallic nanostructures in fluidic channels for fluorescence and Raman enhancement by nanoimprint lithography and lift-off on compositional resist stack," *Microelec. Eng*., Vol. 98, pp. 693-697, 2012.

(17) Chao Wang, Patrick F. Murphy, Nan Yao, Kevin McIlwrath, and Stephen Y. Chou, "Growth of Straight Silicon Nanowires on Amorphous Substrates with Uniform Diameter, Length, Orientation, and Location Using Nanopatterned Host-Mediated Catalyst," *Nano Letters*, vol. 11, pp. 5247-5251, 2011.

(18) Chao Wang, Zengli Fu, Keith J. Morton, Wen-Di Li, and Stephen Y. Chou, "Printing of Sub-20 nm Wide Graphene Ribbon Arrays by Nanoimprinting Graphite Stamp and Electrostatic Force Assisted Bonding," *Nanotechnology*, vol. 22, pp. 445301, 2011.

(19) Chao Wang, Qiangfei Xia, Wen-Di Li, Zengli Fu, Keith J. Morton, and Stephen Y. Chou, "Fabrication of a 60-nm-Diameter Perfectly Round Metal-Dot Array over a Large Area on a Plastic Substrate Using Nanoimprint Lithography and Self-Perfection by Liquefaction," *Small*, vol. 6, pp. 1242-1247, 2010.

(20) Chao Wang and Stephen Y. Chou, "Self-aligned fabrication of 10 nm wide asymmetric trenches for Si/SiGe heterojunction tunneling field effect transistors using nanoimprint lithography, shadow evaporation, and etching," *J. Vac. Sci. Technol. B*, vol. 27, pp. 2790-2794, 2009.

(21) Chao Wang, Zheyao Wang, Tian-Ling Ren, Yiping Zhu, Yi Yang, Xiaoming Wu, Haining Wang, Huajun Fang, and Litian Liu, "A micromachined piezoelectric ultrasonic transducer operating in d 33 mode using square interdigital electrodes," *IEEE Sensors Journal*, vol. 7, pp. 967-976, 2007.

(22) Chao Wang, Tianling Ren, Zheyao Wang, Yiping Zhu, Ningxin Zhang, and Litian Liu, "Fabrication

and characterization of in-plane polarized PZT films with interdigital electrodes," *Integrated Ferroelectrics*, vol. 88, pp. 3-11, 2007.

(23) Chao Wang, Zheyao Wang, Tianling Ren, and Litian Liu, "Design and simulation of a novel operation mode of integrated ferroelectric micro-sensors," *Integrated Ferroelectrics*, vol. 78, pp. 59-67, 2006.

(24) Zheyao Wang, Chao Wang, and Litian Liu, "Design and analysis of a PZT-based micromachined acoustic sensor with increased sensitivity," *IEEE transactions on ultrasonics, ferroelectrics, and frequency control*, vol. 52, pp. 1840-1850, 2005.

8. Patents and Disclosures (23 granted)

(1) Jing Bai, Chao Wang, Yu Yao, Julius Yellowhair, and Jiawei Zuo, "Autonomous Solar Field and Receiver Inspections Based on Polarimetric-Enhanced Imaging,"M20-053P, U.S. Patent 62/963,685, 2020.

(2) Chao Wang and Pengkun Xia, "Low-capacitance nanopore sensor on insulating substrates,"M20-022L, U.S. Patent 62/984,381, 2020.

(3) "Low-Cost Additive Manufacturing of Silver Films for Concentrating Solar-Thermal Plants," M19-288P, U.S. Patent 62/877,140, 2019.

(4) "Photochemical Method to Grow Silver Dendrites," M19-034P, U.S. Patent 62/750,615, 2019.

(5) "Direct metal printing with stereolithography," M18-131P, U.S. Patent 62/635,907, 2018.

(6) "On-Chip Polarization Detection and Polarimetric Imaging," M18-039P, U.S. Patent 62/609,877, 2018.

(7) "Exosome Quantification on Plasmonic Nanosensors for Cancer Diagnosis," M17-218L, U.S. Patent 62/537,835, 2017.

(8) "Low-Noise Biomolecular Sensors," M16-267L, 62/477,861, WO2018136497, 2016.

(9) "Direct Bond Transfer Layers For Manufacturable Sealing of Microfluidic Chips," US20170144149 A1, 2017.

(10) "Nanopillar Arrays with Interfaces for Controlled Polymer Stretching and Effective Translocation into Nanochannels" US9733232 B1, 2017.

(11) "On-chip molecule fluorescence detection," US Patent 9,513,220, 2016.

(12) "Continuous Flow, Size-Based Separation of Entities Down to The Nanometer Scale Using Nanopillar Arrays," US Patent 20,160,144,406, 2016.

(13) "Pillar Array Structure With Uniform And High-Aspect Ratio, Nanometer Gaps," US Patent 20,160,144,361, 2016.

(14) "Biopolymer Separation Using Nanostructured Arrays," US Patent 20,160,146,778, 2016.

(15) "Nanochannel device with three dimensional gradient by single step etching for molecular detection," US20150252414, US20160220996, 2016.

(16) "Nanofluidic channels with gradual depth change for reducing entropic barrier of biopolymers," US Patent US9346052, US9364832, US20150021187, US20150024115, US20160199833, 2016.

(17) "Increasing the Capture Zone by Nanostructure Patterns," US Patent 20,150,323,490, 2015.

(18) "Nanogap in-between noble metals," US20140302675, 2015.

(19) "Reduction of Entropic Barrier of Polyelectrolyte Molecules in a Nanopore Device with Agarose Gel" US Patent 20,150,284,791, 2015.

(20) "Self-formed nanometer channel at wafer scale," US8945404, US 8652337, CN103922275A, CN103922275B, 2014.

(21) "Polynucleotide configuration for reliable electrical and optical sensing," CN104342436A, US20150037787, US20150037843, 2013.

(22) "Microfluidic Sensors with Enhanced Optical Signals", WO2014055559 A1, CN104823049A, EP2904389A1, US 20150253321, 2016.

(23) "Field-effect Based Nanosensor for Bio-polymer Manipulation and Detection." US 8906215, US 8999130, CN 104737007, DE 112013005187, WO 2014084931.

(24)

9. Conferences and Presentations ('_', Wang lab members at ASU)

(1) Yu Yao, Jing Ba, Ali Basiri, Xiahui Chen, Jiawei Zuo, and Chao Wang, "Highly efficient on-chip integratable metamaterials for polarimetric detection and imaging," presented at the 2020 Lawrence symposium on epitaxy, Scottsdale, AZ, 2020.

(2) Zhi Zhao, Jing Bai, Yu Yao, and Chao Wang, "Printing continuous metal structures via polymer-assisted photochemical deposition," presented at the 2020 Lawrence symposium on epitaxy, Scottsdale, AZ, 2020.

(3) Zhi Zhao, Ninad Chamele, Michael Kozicki, Yu Yao, and Chao Wang, "Photochemical Synthesis of Dendritic Silver Nano-particles (AgNPs) for Anti-counterfeiting," presented at the The International Conference on Electron, Ion, and Photon Beam Technology and Nanofabrication Minneapolis, MN, 2019.

(4) Zhi Zhao, Chao Wang, Yan Liu, and Hao Yan, "Soft Robotics Programmed with Double Crosslinking DNA Hydrogels," presented at the The International Conference on Electron, Ion, and Photon Beam Technology and Nanofabrication Minneapolis, MN, 2019.

(5) Zhi Zhao, Xiahui Chen, Ali Basiri, Yu Yao, Yan Liu, Hao Yan, and Chao Wang, "DNA Origami-Templated Assembly of Heterogeneous Nanocavity for Quantum Emitter," presented at the The International Conference on Electron, Ion, and Photon Beam Technology and Nanofabrication Minneapolis, MN, 2019.

(6) Ali Basiri, Xiahui Chen, Jing Bai, Pouya Amrollahi, Joe Carpenter, Zachary Holman, Chao Wang, and Yu Yao, "Nature-Inspired Chiral Metasurfaces for Circular Polarization Detection and Full-Stokes Polarimetric Measurement," presented at the The International Conference on Electron, Ion, and Photon Beam Technology and Nanofabrication Minneapolis, MN, 2019.

(7) Pengkun Xia, Jiawei Zuo, Pravin Paudel, and Chao Wang, "Scalable fabrication of triangular nanopore membranes on sapphire substrate for low-noise DNA detection," presented at the The International Conference on Electron, Ion, and Photon Beam Technology and Nanofabrication Minneapolis, MN, 2019.

(8) Jing Bai, Chu Wang, Xiahui Chen, Ali Basiri, Chao Wang, and Yu Yao, "Chip Integrated Plasmonic Flat Optics for Mid-infrared Polarization Detection," presented at the Conference on Lasers and Electro-Optics (CLEO), San Jose, CA, 2018.

(9) Ali Basiri, Xiahui Chen, Pouya Amrollahi, Jing Bai, Chao Wang, and Yu Yao, "Highly Efficient Circularly Polarized Light Detection Based on Chip-Integrated Metasurface," presented at the Conference on Lasers and Electro-Optics (CLEO), San Jose, CA, 2018.

(10) Jing Bai, Chu Wang, Xiahui Chen, Ali Basiri, Chao Wang, and Yu Yao, "Chip Integrated Plasmonic Flat Optics for Mid-infrared Polarization Detection," presented at the Materials Research Society (MRS) meetings, Phoenix, AZ, 2018.

(11) Ali Basiri, Xiahui Chen, Pouya Amrollahi, Jing Bai, Joe V. Carpenter, Zachary Holman, Chao Wang, and Yu Yao, "Highly Efficient Circularly Polarized Light Detection Based on Chip-Integrated Metasurface," presented at the Materials Research Society (MRS) Meeting, Phoenix, 2018.

(12) Xiahui Chen, Yu Yao, and Chao Wang, "A Novel Fano Resonance Based Plasmofluidic Nanoantenna for Ultrasensitive Biological Nanoparticle Detection," presented at the Materials Research Society (MRS) meetings, Phoenix, AZ, 2018.

(13) Xiahui Chen, Chu Wang, Yu Yao, and Chao Wang, "Plasmonic Vertically Coupled Complementary Antennas for Dual-Mode Infrared Molecule Sensing," presented at the Material Research Society (MRS) Meeting, Phoenix, AZ, 2017.

(14) Chao Wang, Chu Wang, and Yu Yao, "Multiplexed High-Security Signaling System Using Bioinspired Metasurface Nanostructures," presented at *Defense Innovation - SBIR/STTR Summit*, 2015.

(15) Chao Wang, Robert L. Bruce, Elizabeth A. Duch, Jyotica V. Patel, Joshua T. Smith, Yann Astier,

Evan G. Colgan, Qinghuang Lin, and Gustavo Stolovitzk, "Clog-free Translocation of Long DNA in Nanofluidic Pillar Arrays and 30 nm Wide Channels: a Fabrication and Hydrodynamic Study," presented at *18th International Conference on Miniaturized Systems for Chemistry and Life Sciences (μTAS 2014)*, San Antonio, TX, 2014.

(16) Binquan Luan, Chao Wang, Ajay Royyuru, and Gustavo A. Stolovitzky, "Controlling Motion of DNA in a Nanochannel with Transversal Alternating Voltages," in *Biophysical Society 58th Annual Meeting* San Francisco, California, 2014.

(17) Chao Wang, Sung-wook Nam, John M. Cotte, et al., "200 mm Wafer-Scale Integration of Sub-20 nm Sacrificial Nanofluidic Channels for Manipulating and Imaging Single DNA Molecules," in *IEEE International Electron Devices Meeting (IEDM)*. Washington, DC, 2013.

(18) Chao Wang, "Nanofluidic Channels -- A Promising Platform for DNA Sequencing," in *IBM Materials Research Community (MRC) Seminar Series*, 2013.

(19) Ruoming Peng, Chao Wang, Liangcheng Zhou, et al., "Fabrication and Demonstration of Ultra-sensitive and Fast Immunoassay Platform With 3D Nanoplasmonic Cavity Antenna and Microfluidics Using Nanoimprint," in *EIPBN'13*. Nashville, TN, 2013.

(20) Ruoming Peng, Chao Wang, Liangcheng Zhou, Qi Zhang, Weihua Zhang, and Stephen Y. Chou, "Fabrication and Demonstration of Ultra-sensitive and Fast Fluorescence Immunoassay Using Novel Nanoplasmonic Sensor inside Microfluidic Channels," in *Micro TAS 2012*. Okinawa, Japan, 2012.

(21) Ruoming Peng, Chao Wang, Liangcheng Zhou, Qi Zhang, Weihua Zhang, and Stephen Y. Chou, "Fabrication and Performance of Ultra-sensitive, Fast, Nanoplasmonic Microfluidic Immunoassay by Large-Area High-Precision Nanoimprint," in NNT 2012. Napa Valley, USA, 2012.

(22) Chao Wang, Ruoming Peng, Wen-Di Li, and Stephen Y. Chou, "Plasmonic Nano-cavity Antenna Arrays Integrated in Fluidic Systems for >20X Enhancement of Single DNA Molecule Detection", MNE, Berlin, Germany, 2011.

(23) Chao Wang, Weihua Zhang, and Stephen Y. Chou, "Fabrication and Performance of Plasmonic Nano-cavity Antenna Arrays Self-aligned in Fluidic Channels for Enhancement of Single DNA Molecule Detection", Micro TAS, Seattle, Washington, 2011.

(24) Ruoming Peng, Chao Wang, Wendi Li, Fei Ding, Weihua Zhang, Liangchen Zhou, and Stephen Y. Chou, "Over 20 Fold Fluorescence Enhancement of YOYO-1 Labeled DNA Using New 3D Cavity Nanoscale Plasmonic Antenna Array", Micro TAS, Seattle, Washington, 2011.

(25) Chao Wang and Stephen Y. Chou, "Large-area Patterning of Au Nano-particles Self-aligned to Fluidic Channels for Enhancement of Molecule Detection", EIPBN'11, Las Vegas, Nevada, 2011.

(26) Chao Wang, Qi Zhang, and Stephen Y. Chou, "Fabrication of Large-area Plasmonic Nano-cavity Antenna Array for High Efficiency Mid-and-Far Infrared Sensing", EIPBN'11, Las Vegas, Nevada, 2011.

(27) Hao Chen, Chao Wang, and Stephen Y. Chou, "Extraction Efficiency Improvement of GaN-based Light-emitting Diodes Using Sub-wavelength Nanoimprinted Patterns on Sapphire Substrates", EIPBN'11, Las Vegas, Nevada, 2011.

(28) Siran Li, Chao Wang, Yan Chen, and et al., "Nanofluidic Single DNA Sorter and Analyzer Fabricated by Nanoimprint and Wafer Bonding", EIPBN'11, Las Vegas, Nevada, 2011.

(29) Wen-Di Li, Fei Ding, Yixing Liang, Chao Wang, and et al., "Design and Fabrication of High Enhancement Yet Wafer-Scale Uniform SERS/Plasmonic Structures Based on Nanoimprint Lithography and Self-Assembly", EIPBN'11, Las Vegas, Nevada, 2011.

(30) Hao Chen, Chao Wang, and Stephen Y. Chou, "Extraction Efficiency Improvement of GaN Light-emitting Diode Using Sub-wavelength Nanoimprinted Patterns on Sapphire Substrate", CLEO'11, Baltimore, Maryland, 2011.

(31) Chao Wang, Hao Chen, and Stephen Y. Chou, "Light Extraction Efficiency Improvement of Blue GaN Light Emitting Diode Using Nanoimprinted Patterns on Sapphire Substrate," NNT'09, Oresund and Copenhagen, 2010.

(32) Chao Wang, Patrick F. Murphy, Nan Yao, and et al., "Growth of Straight Crystal Silicon Nanowires on Nanopatterned Amorphous Substrate with Uniform Diameter and Length, Preferred Orientation,

and Predetermined Location," EIPBN'10, Anchorage, Alaska, 2010.

(33) Wen-Di Li, Chao Wang, and Stephen Y. Chou, "100 nm Metallic Checkerboard by Wafer-scale Nanoimprint and Its Application in Surface Enhanced Raman Scattering", CLEO'10, San Jose, California, 2010.

(34) Chao Wang, Qiangfei Xia, Wen-Di Li, et al., "Fabrication of Uniform Dense Metal Dot Arrays over a Large Area on Flexible Plastic Substrate Using UV Nanoimprint Lithography and Self-Perfection by Liquefaction (SPEL)," NNT'09, San Jose, California, 2009.

(35) Wen-Di Li, Chao Wang, and Stephen Y. Chou, "Fabrication of Large-Area 100 nm Checker Board Mold Using 3D Patterning with Multiple Nanoimprint Lithography and Self-Aligned Selective Etching", EIPBN'09, Marco Island, Florida, 2009.

(36) Chao Wang, Zengli Fu, Wen-Di Li, and Stephen Y. Chou, "Printing of Sub- 20 nm Wide Graphene Ribbon Arrays over a Large Area by Imprinting Nanostructures on a Graphite Stamp and Electrostatic Force Assisted Bonding," NNT'09, San Jose, California, 2009.

(37) Chao Wang and Stephen Y. Chou, "Self-Aligned Fabrication of 10 nm-Wide Asymmetric Trenches in Si for Heterojunction Tunneling FETs Using Nanoimprint Lithography, Shadow Evaporation, and Etching," EIPBN'09, Marco Island, Florida, 2009.

(38) Tianling Ren, Hao Chen, Yi Yang, Yiping Zhu, Di Fu, Chao Wang, Xiaoming Wu, Jian Cai, Litian Liu, and Zhijian Li, "Micromachined piezoelectric acoustic device," in International Workshop on Electron Devices and Semiconductor Technology (IEDST), 2009, pp. 1-6.

(39) Chao Wang, Patrick F. Murphy, and Stephen Y. Chou, "Location-, Diameter-, Length-, and Orientation- Controlled Growth of Si Nanowires on Amorphous Substrate Using Nanoimprint Lithography and Novel Catalysts," NNT'08, Kyoto, Japan, 2008.

(40) Yiping Zhu, Tianling Ren, Chao Wang, Zheyao Wang, Litian Liu, and Zhijian Li, "Novel In-Plane Polarized PZT Film Based Ultrasonic Micro-Acoustic Device," in International Solid-State Sensors, Actuators and Microsystems Conference (TRANSDUCERS), 2007, pp. 1291-1294.

10. Postdoc, graduate students, and undergrads mentoring

Grad student	Previous School	Enrolled from	Expected Graduation	Research Topic
Xiahui Chen	Univ. Electronic Science and Technology of China	Feb 2016	June 2020	Plasmonic nanosensors for molecular sensing; metasurface polarimetric imager
Pengkun Xia	Southern University of Science and Technology	Aug 2016	June 2021	Low-noise sapphire chips for electronic DNA sensing; nanoDLD exosome sorting; 3D printing
Md Ashif Ikbal	Yeungnam University	Aug 2017	June 2022	Supported Lipid Bilayer formation and optical sensing
Jiawei Zuo (co-advised w/ Dr. Yu Yao)	Wuhan University	Aug 2017	June 2022	Strong coupling of 2D quantum emitter in optical cavities
Shinhyuk Choi	Hongik University	Jan 2018	June 2022	Nanoimprint development; 3D printing; Strong coupling of 2D quantum emitter in optical cavities

Postdoc	Ph.D. School	At Wang Group	Research Topic

associate			
Pravin Paudel	Univ South Carolina	2016.4 to 2017.9	Sapphire nanochip fabrication, DNA sensing, 2D material growth
Zhi Zhao	Texas A&M University	2016.12 to 2019.6	DNA origami based nanophotonics; 3D printing, Protein sensing

Undergrad student	Department/School	At Wang Group	Research Topic
Connie Kwok	Biological Sciences @ASU	2017.2 to 2018.1	Nanopore for DNA sensing

11. Teaching Experience

Semester	Course Number and Title	Course Contents/Goals
Fall 2016	ASU 101 The ASU Experience	Introduce all new first-time ASU students to the unique elements, culture, challenges, and opportunities of their university.
Fall 2017	EEE 436/591 Fundamentals of Solid State Devices	Guide students to understand the conceptual operation and quantitative output of semiconductor devices, including most commonly p-n junctions and metalsemiconductor junctions, metal-oxide semiconductor capacitors and transistors, and bipolar junction transistors.
Spring 2018	EEE 536 Semiconductor Characterizations	Understanad the characterization techniques used in the semiconductor research, including electrical characterization, optical techniques, electron beam, ion beam, and X-ray methods.
Fall 2018	EEE 202 Circuit I	Understand how linear circuit networks are built from basic circuit elements, how they work, and how these network systems are used to control signals.
Spring 2019	EEE598 Nanobiotechnology: From Nanoscience to Biomedicine	Biotechnology and nanotechnology are merging at a fast pace, creating new multidisciplinary research areas and new industries. The course is designed to train and prepare graduate students as next-generation work force in these exciting areas. The course will cover broad topics from nanoscale physics and molecular fundamentals, to nanostructure- biomolecule interactions, and to applications in nanophotonics and quantum optics.
Fall 2019	EEE 202 Circuit I	Understand how linear circuit networks are built from basic circuit elements, how they work, and how these network systems are used to control signals.

12. Professional Services

Conference Organization

Program committee of the International conference on Electron, Ion, and Photon Beam Technology and Nanofabrication (EIPBN 2015 - present).

Journal Reviewer (14 journals)

- ACS Applied Materials & Interfaces
- ACS Nano
- AIP Advances
- Applied Physics Letters
- Biomicrofluidics
- Chemical Science
- IEEE Transactions on NanoBioscience
- Journal of Applied Physics
- Journal of Micromechanics and Microengineering
- Journal of Optics
- Journal of Physics D: Applied Physics
- Nanotechnology
- Research
- The Journal of Physical Chemistry Letters

Proposal Review Panel

- NSF Division of Civil, Mechanical and Manufacturing Innovation, 2017
- NSF Division of Electrical, Communications and Cyber Systems, 2019
- NIH Bioengineering Sciences and Technologies (BST) Nanotechnology Study Section, 2019
- NSF Division of Chemical, Bioengineering, Environmental and Transport Systems, 2020

ASU Committees

- 2019.2 - present: ASU FURI faculty committee.
- 2019.9 - present: ECEE communications search committee. Help recruit a staff hire to focus on print, web and social media presence towards improving faculty recognition, PhD recruitment and program rankings.

13. Education and Outreach

(1) 2017.2- 2017.9: Instructor of two high-school students Somil Jain and Sachin Jaishankar from Hamilton High School in Chandler, AZ. The two students worked on fluidic simulation of nanoDLD structure using Lattice-Boltzmann simulation. They presented their research at the International Science and Engineering Fair and eventually were placed 4th in the Biochemistry category.

(2) 2018.1- 2018.12: Instructor of a senior design project of ASU undergraduate students Isasti Juarez, Shahin Pirzamany, Huiyi Tang (female), and Zhan Zhang. Topic: Design a portable, handheld, smartphone spectrometer.

(3) 2018.2: ASU Open Door. The PI's lab hosted visitors who are interested in the exosome liquid biopsy technology. The PI's team 3D-printed a nanoDLD model to explain the working principle of sorting, and showed the visitors the fluidic chip, the jig and the fluorescence imaging setup.

(4) 2018.3: DISCOVER The Fulton Schools. The PI discussed with high-school students from Arizona interested in ECEE programs at ASU, and shared with the students his own career path and current research areas, using the liquid biopsy project as an example.

(5) 2018.8- 2019.5: Instructor of one high-school student Shreyas Hallur at BASIS Peoria high school. He worked on fluidic simulation of nanoDLD structure using Lattice-Boltzmann simulation, and performed optical measurement of nanophotonic structures for molecular sensing.

(6) 2019.11- present: Instructor of two high-school students Katherine Chou (female) and Hersh Nanda on nanopore molecular sensing and PDMS based microfluidic devices.