

Wei-Chuan Shih, Ph. D.

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Department of Electrical and Computer Engineering
University of Houston, Houston TX 77204
<http://nanobiophotonics.ee.uh.edu>

Phone: (713) 743-4454
E-mail: wshih@uh.edu

BIOGRAPHICAL SUMMARY



Wei-Chuan Shih earned his BS, MS, and Ph.D. from National Taiwan U, National Chiao Tung U, and Massachusetts Institute of Technology, respectively. His Ph.D. work was conducted at MIT Spectroscopy Laboratory/NIH Laser Biomedical Research Center under late laser physicist Dr. Michael S. Feld, studying novel optical spectroscopy techniques for non-invasive chemical/biomedical sensing and disease diagnosis. He also worked extensively on MEMS design and nanofabrication at MIT Mechanical Engineering under Drs. George Barbastathis and Sang-Gook Kim. Prior to joining the U. of Houston, he was Schlumberger research fellow, studying optical analysis of hydrocarbon and offshore oil spill monitoring.

Dr. Shih is tenured Associate Professor of Electrical & Computer Engineering, Biomedical Engineering, Materials Science & Engineering and Chemistry at the U. of Houston. He was MIT Martin Fellow of Sustainability, and won NSF CAREER Award in Biophotonics, inaugural NASA Early CAREER Faculty Award, UH Award for Excellence in Research and Scholarship, and UH Cullen College of Engineering Faculty Research Excellence Award. Besides NSF and NASA, his research is also supported by NIH, DoI, and GoMRI, with a past 6-year total over US\$3.5M. Dr. Shih has served as Associate Editor of Optical Society of America’s major journal *Applied Optics* since 2017. He is a Senior Member of IEEE and SPIE.

Dr. Shih has published more than 100 articles in the public domain (including 60 peer-reviewed journal papers and 5 invited book chapters). He has 11 issued and 3 pending US patents, one of which has been licensed by his company. His scholarly papers appear in a diverse portfolio of peer-reviewed journals such as *ACS Nano Letters*, *Applied Materials & Interfaces*, *ACS Photonics*, *Analytical Chemistry*; *Wiley Advanced Materials*, *Small*, *J. Biophotonics*, *RSC Nanoscale Horizons*, *Nanoscale*, *J. of Materials Chemistry*, *Analysts*, *Advances*; *OSA Optics Express*, *Biomedical Optics Express*, *Optical Materials Express*, *Optics Letters*, *Applied Optics*; *SPIE J. of Biomedical Optics*, *SAS Applied Spectroscopy*, and *IEEE/ASME J. MEMS*. His research has been featured on *OSA Optics & Photonics News (OPN)*, *CNBC*, *Forbes*, *ScienceDaily*, *Phys.org*, *SpectroscopyNOW*, *Houston PBS*, *UH Moment* and numerous other media outlets. Dr. Shih has delivered seminars at famed institutions such as MIT, Columbia, Duke, Rice, UBC, ETH, St. Andrews, NC State, U Minnesota, UT Health, UC Davis, TAMU, Johns Hopkins, U Iowa, Vanderbilt, RPI, NCTU, NTU, CUHK, HKU, NIH, Schlumberger, Halliburton and etc. He has also delivered invited talks at conferences such as SPIE Photonics West, SPIE Optics & Photonics, SPIE Defense & Commercial Sensing, ACS meetings, ECI Advances in Optics, IEEE Photonics Conference, IEEE NANOMED, PittCon, SciX/FACSS, META, and etc. He has actively engaged in serving the scientific community by the following participation: IEEE NANOMED (general program co-chair), IEEE Optics MEMS & Nanophotonics (program committee member), SPIE Photonics West and SPIE Translational Biophotonics (program committee member), SciX (Plasmonics session organizer) and numerous session chairing.

PROFESSIONAL PREPARATION

National Taiwan University	Mechanical Eng.	B.S., 1997
National Chiao Tung University	Mechanical Eng.	M.S., 1999
Massachusetts Institute of Technology	Mechanical Eng.	Ph.D., 2007
Schlumberger-Doll Research	Sensor physics	2007-2009

APPOINTMENTS

Associate Professor with tenure	9/1/2009-present
Department of Electrical and Computer Engineering, UH	
Department of Biomedical Engineering, UH (2010-)	
Department of Chemistry, UH (3/2015-)	
Program of Materials Science and Engineering, UH (9/2015-)	

HONORS AND SYNERGISTIC ACTIVITIES

1. Associate Editor, *Applied Optics*, Optical Society of America, 2017-present.

2. Selected Past 4-year Invited Seminar: 2018: U British Columbia/BC Cancer Agency, U Victoria, UT Arlington, U Iowa; 2017: National U Singapore, Nanyang Technological U, George Washington U; 2016: Columbia U, NC State U, U Iowa, Rice U, U Texas Health; 2015: Rice U, U Central Florida, U Minnesota; 2014: Johns Hopkins U, Rice U, NCTU, Chinese U HK, Duke U, UT Arlington, Huazhong UST, National Institute of Health
3. NSF CAREER Award, 2012 (CBET-Biophotonics)
4. NASA Early Career Faculty Award, 2012 (Microfluidic biosensing)
5. NSF Nano-biosensing, CCSS, CMI, DMR, NM, SBIR panelist/reviewer
6. NIH Instrument and System Development (ISD) study section ad hoc member, 2011-2015
7. Faculty Research Excellence Award, Cullen College Engineering, University of Houston, 2015
8. University Award of Excellence in Research and Scholarship, University of Houston, 2013
9. Services: IEEE Optical MEMS and Nanophotonics (TPC), IEEE NANOMED 2016 (General Program Co-Chair), SPIE Photonics West: Plasmonics in Biology and Medicine (TPC), IEEE NANOMED 2018 planning committee, SciX session organizer, META'16 (Session organizer)
10. DotLens Microscopy featured on CNBC, HoustonPBS, ScienceDaily, and numerous science and technology news outlets, May 2015
11. Best poster award, Advances in Optics for Biotechnology, Medicine and Surgery, 2011
12. Best paper award, Schlumberger NAM REMS Reservoir Symposium, 2008
13. MIT Martin Fellows for Sustainability, MIT Laboratory for Energy and the Environment (2005-2006)

Funded Grants and Contracts

Past 6-year total: >US\$3.5M

1. AFOSR, "Flexible broad-band optical device," 2018, Role: PI (UH).
2. Criag Neilson Foundation, "Optogenetic integration of grafted neural stem cells," 2017-2019, Role: PI (UH).
3. CBET-1605683 "Multimodal signal amplification by collaborative plasmonic intensification and catalytic multiplication (c-PI/CM)," National Science Foundation, 2016-2019, Role: PI.
4. CBET-1643391 "EAGER: Empowering Citizen Scientists to Monitor Environmental Waterborne Pathogens by DotLens Smartphone Microscopy," National Science Foundation, 2016-2018, Role: PI .
5. IIP-1558240 "DotLens Smartphone Microscopy," National Science Foundation, 2015-2016, Role: PI.
6. BSEE-1040 "Distributed chemical sensing for sub-surface oil spill sensing," Department of Interior, 2015-2017, Role: PI.
7. 1R21NS084301-01A1 "Probes for optogenetic interrogation and precise localization of neural circuits," National Institute of Health, 2014-2016, Role: Co-PI.
8. NNX12AQ44G "Microfluidic Label-Free Sensing for Rapid Multiplexed Pathogen Detection in Space Missions," National Aeronautics and Space Administration, 2012-2015, Role: PI.
9. GoMRI-030 "Novel sensor system for the early detection and monitoring of offshore oil spills," Gulf of Mexico Research Initiative, 2013-2016, Role: PI.
10. CBET-1151154 "Integrated molecular and computational sensing (IMACS) for label-free bacteriomics," National Science Foundation 2012-2018, Role: PI.
11. "Studies of Surface Plasmon Resonance on Nanostructured Substrates," Entroplus LLC, 2011-2012, Role: Co-PI.
12. Small grant award, University of Houston, 2011-2012, Role: PI.
13. New faculty award, University of Houston, 2009-2010, Role: PI.

PRODUCTS

Book chapters and magazine articles

1. Camille G Artur and Wei-Chuan Shih, “Nanoporous gold nanoparticles and arrays for label-free nanoplasmonic sensing,” Chapter 2 in *Miniature Fluidic Devices for Rapid Biological Detection*, Springer, 2018.
2. Wei-Chuan Shih, “Hybrid fabrication makes better plasmonic nanostructures for SERS,” *Photonics Spectra*, August, 2013.
3. Wei-Chuan Shih, Kate L. Bechtel, and Michael S Feld, “Quantitative Biological Raman Spectroscopy,” in *Handbook of Optical Sensing of Glucose in Biological Fluids and Tissues*, Editor: Valery V. Tuchin; Taylor & Francis (2008).
4. Wei-Chuan Shih, Kate L Bechtel, Michael S Feld, Mark A Arnold, Gary W Small, “Introduction to spectroscopy for noninvasive glucose sensing,” in *Analytical Chemistry of In Vivo Glucose Measurements*; Cunningham, D.; Stenken, JA, Eds.; Wiley Chemical Analysis Series (2009).
5. Wei-Chuan Shih, Kate L Bechtel, Michael S Feld, “ Non-invasive glucose sensing with Raman spectroscopy,” in *Analytical Chemistry of In Vivo Glucose Measurements*; Cunningham, D.; Stenken, JA, Eds.; Wiley Chemical Analysis Series (2009).

Refereed journal publications (Published after 2009)

1. Christopher Ertsgaard, Nathan Wittenberg, Daniel Klemme, Avijit Barik, Wei-Chuan Shih, and Sang-Hyun Oh, Integrated nanogap platform for sub-volt dielectrophoretic trapping and real-time Raman imaging of biological nanoparticles, *Nano Letters*, 2018 (Published on line).
2. Jingting Li, Fusheng Zhao, Yu Deng, Dong Liu, Chia-Hung Chen, and Wei-Chuan Shih, Photothermal generation of programmable microbubble array on nanoporous gold disks, *Optics Express* 26(13): 16893-16902 2018.
3. Md Masud Parvez Arnob, Hung Nguyen, Zhu Han, and Wei-Chuan Shih, Compressed sensing hyperspectral imaging in the 0.9-2.5 μm short-wave infrared wavelength range using digital micro-mirror device and InGaAs linear array detector, *Applied Optics* 57(18): 5019-5024 2018.
4. Erkin Seker, Wei-Chuan Shih, and Keith J Stine, Nanoporous metal by alloy corrosion: Bioanalytical and biomedical applications, *MRS Bulletin* 43(1): 49-56 2018.
5. Tiffany Franklin, Lauren Perry, Wei-Chuan Shih, and Jorn Yu, Detection of phytocannabinoids from buccal swabs by headspace solid phase microextraction – gas chromatography/mass spectrometry, *Analytical Methods* 10: 942-946 2018.
6. Shihhao Ran, Sebastian Berisha, Rupali Mankar, Wei-Chuan Shih, and David Mayerich, Mitigating Fringing In Discrete Frequency Infrared Imaging Using Time-Delayed Integration, *Biomedical Optics Express* 9(2): 832-843 2018.
7. Camille G Artur, Tasha Womack, Fusheng Zhao, Jason L Eriksen, David Mayerich, and Wei-Chuan Shih, Plasmonic nanoparticle-based expansion microscopy with surface-enhanced Raman and dark-field spectroscopic imaging, *Biomedical Optics Express* 9(2): 603-615 2018.
8. Masud Arnob and Wei-Chuan Shih, 3D plasmonic nanoarchitecture as an emerging biosensing platform, *Nanomedicine* 12(21): 2577-2580 2017.
9. Yu-Lung Sung, Fernando Campa, and Wei-Chuan Shih, Open-source, do-it-yourself multi-color fluorescence smartphone microscopy, *Biomedical Optics Express* 8(11): 5075-5086 2017.
10. Yu-Lung Sung, Jacob Garan, Hoang Nguyen, Zhenyu Hu, and Wei-Chuan Shih, Automated batch characterization of inkjet-printed elastomer lenses using a LEGO® platform, *Applied Optics* 56(26): 7346-7350 2017.
11. Fusheng Zhao, Masud Arnob, Oussama Zenasni, Jingting Li, and Wei-Chuan Shih, Far-field plasmonic coupling in 2-dimensional polycrystalline plasmonic arrays enables wide tunability with low-cost nanofabrication, *Nanoscale Horizons* 2(5): 267-276 2017.
12. Mehmet Tatli et al., Raman spectra and DFT calculations for botryococcene and methylsqualene hydrocarbons from the B race of the green microalga *Botryococcus braunii*, *Journal of Molecular Structures* 1147: 427-437 2017.

13. Fusheng Zhao, Jianbo Zeng, and Wei-Chuan Shih, Nanoporous gold nanocomposites as a versatile platform for plasmonic engineering and sensing, *Sensors* 17(7): 1519 2017.
14. Masud Arnob, Fusheng Zhao, Jingting Li, and Wei-Chuan Shih, EBL-based fabrication and different modeling approaches for nanoporous gold nanodisks, *ACS Photonics* 4(8): 1870-1878 2017.
15. Masud Arnob and Wei-Chuan Shih, 3-dimensional plasmonic substrates based on chicken eggshell bio-templates for SERS based bio-sensing, *Micromachines* 8(6): 196 2017.
16. Suyan Qiu, Fusheng Zhao, Oussama Zenasni, Jingting Li, and Wei-Chuan Shih, Catalytic assembly of DNA nanostructures on nanoporous gold array as 3D architectures for label-free telomerase activity sensing, *Nanoscale Horizons* 2(4): 217-224 2017.
17. Ngoc-Duy Dinh, Rongcong Luo, Maria Tankeh Asuncion Christine, Weikang Nicholas Lin, Wei-Chuan Shih, James Cho-Hong Goh, and Chia-Hung Chen, Effective Light Directed Assembly of Building Blocks with Microscale Control, *Small* 13(24): 1700684 2017.
18. Hoang Nguyen, Md Masud Parvez Arnob, Aaron T. Becker, John C. Wolfe, Matthew K. Hogan, Philip J. Horner, and Wei-Chuan Shih, Fabrication of multipoint side-firing optical fiber by laser micro-ablation, *Optics Letters*, 42(9): 1808-1811 2017.
19. Suyan Qiu, Fusheng Zhao, Oussama Zenasni, Jingting Li, and Wei-Chuan Shih, Nanoporous gold disks functionalized with stabilized G-quadruplex moieties for sensing small molecules, *ACS Applied Materials & Interfaces* 8(44): 29968-29976 2016.
20. Jingting Li, Fusheng Zhao, and Wei-Chuan Shih, Direct-write patterning of nanoporous gold microstructures by in situ laser-assisted dealloying, *Optics Express* 24(20): 23610-23617 2016.
21. Jae Won Jeong, Md Masud Parvez Arnob, Kwang-Min Baek, Seung-Yong Lee, Wei-Chuan Shih, and Yeon Sik Jung, Three-dimensional cross-point plasmonic nano-architectures containing dense and regular hot spots for surface-enhanced Raman spectroscopy analysis, *Advanced Materials*, 28(39): 8695-8704 2016.
22. Wei-Chuan Shih*, Gregg Santos, Fusheng Zhao, Oussama Zenasni, and Masud Arnob, Simultaneous chemical and refractive index sensing in 1-2.5 μm wavelength range on nanoporous gold disks, *Nano Letters*, 16 (7): 4641-4647 2016.
23. Gregg Santos, Felipe Ibañez de Santi Ferrara, Fusheng Zhao, Debora F. Rodrigues, and Wei-Chuan Shih, Photothermal inactivation of heat-resistant bacteria on nanoporous gold disk arrays, *Optical Materials Express* 6(4): 1217-1229 2016.
24. Jingting Li, Yong Du, Ji Qi, Ravikumar Sneha, Anthony Chang, Chandra Mohan, Wei-Chuan Shih*, Raman spectroscopy as a diagnostic tool for monitoring acute nephritis, *Journal of Biophotonics* 9(3): 260-269 2015.
25. Yu-Lung Sung, Jenn Jeang, Chia-Hsiung Lee, and Wei-Chuan Shih*, Fabricating optical lenses by inject printing and heat-assisted in situ curing of polydimethylsiloxane for smartphone microscopy, *Journal of Biomedical Optics* 20(4): 047005 2015.
26. Wei-Chuan Shih*, Kate L Bechtel, and Mihailo Rebec, Non-invasive glucose sensing by transcutaneous Raman spectroscopy, *Journal of Biomedical Optics* 20(5): 051036 2015.
27. Ming Li, Yong Du, Fusheng Zhao, Jianbo Zeng, Chandra Mohan, and Wei-Chuan Shih*, Reagent- and separation-free measurements of urine creatinine concentration by stamping surface-enhanced Raman scattering (S-SERS), *Biomedical Optics Express* 6(3): 849-858 2015.
28. Gregg Santos, Fusheng Zhao, Jianbo Zeng, Ming Li, and Wei-Chuan Shih*, Zepto-mole cancer marker detection by surface-enhanced fluorescence on nanoporous gold disk substrates, *Journal of Biophotonics* 8(10): 855-863 2015.
29. O Khantamat, CH Li, F Yu, AC Jamison, WC Shih, C Cai and TR Lee, Gold nanoshell-decorated silicone surfaces for the NIR photo thermal destruction of the pathogenic bacterium *E. faecalis*, *ACS Applied Materials & Interfaces* 7(7): 3981-3993 2015.
30. Peter Liu, Ji Qi, Wei-Chuan Shih*, and Kirill Larin*, Improvement of tissue analysis and classification using Optical Coherence Tomography combined with Raman spectroscopy, *Journal of Innovative Optical Health Sciences* 8(2): 1550006, 2015.

31. Fusheng Zhao, Jianbo Zeng, and Wei-Chuan Shih*, In situ patterning of hierarchical nanoporous gold structures by in-plane dealloying, *Materials Science and Engineering B* 194:34-40, 2015.
32. Ji Qi, Pratik Motwani, Jianbo Zeng, John C. Wolfe, and Wei-Chuan Shih*, Morphological, plasmonic, and SERS characterization of DC-sputtered gold nanoislands, *Biomedical Spectroscopy and Imaging* 4(1): 95-103, 2015.
33. Wei-Chuan Shih*, Constrained regularization for non-invasive glucose sensing using Raman spectroscopy, *Journal of Innovative Optical Health Sciences* 8(4): 1550022. 2015.
34. Jianbo Zeng, Fusheng Zhao, Ming Li, Chien-Hung Li, T. Randall Lee, and Wei-Chuan Shih*, Morphological control and plasmonic tuning of nanoporous gold nanoparticles by surface modifications, *Journal of Materials Chemistry C* 3:247-252, 2015.
35. Ji Qi, Kate L Bechtel, and Wei-Chuan Shih*, Automated image curvature assessment and correction for high-throughput Raman spectroscopy and microscopy, *Biomedical Spectroscopy and Imaging* 3(4): 359-368, 2014.
36. Md Masud Parvez Arnob, Fusheng Zhao, Jianbo Zeng, and Wei-Chuan Shih*, Laser rapid thermal annealing enables tunable plasmonics in nanoporous gold nanoparticles, *Nanoscale* 6(21), 12470-12475, 2014.
37. Narendran Sudheendran, Ji Qi, Eric D. Young, Alexander J. Lazar, Dina C. Lev, Raphael E. Pollock, Kirill V. Larin, Wei-Chuan Shih*, High throughput Raman spectral imaging complements optical coherence tomography for tumor boundary detection, *Laser Physics Letters* 11:105602, 2014 (*: Equal contribution).
38. Jianbo Zeng, Ji Qi, Fuquan Bai, Jorn Yu, and Wei-Chuan Shih*, Analysis of ethyl and methyl centralite vibrational spectra for mapping organic gunshot residue, *Analyst* 139(17), 4270-4278, 2014.
39. Jianbo Zeng, Fusheng Zhao, Chien-Hung Li, Yifei Li, Yan Yao, T. Randall Lee, and Wei-Chuan Shih*, Internal and external morphology-dependent plasmonic properties in nanoporous gold disks, *RSC Advances* 4, 36682-36688, 2014.
40. Ming Li, Fusheng Zhao, Jianbo Zeng, Ji Qi, Jing Lu, and Wei-Chuan Shih*, Microfluidic surface-enhanced Raman scattering (SERS) sensor with monolithically integrated nanoporous gold disk (NPGD) arrays for rapid and label-free biomolecular detection, *Journal of Biomedical Optics* 19(11), 111611, 2014.
41. Ji Qi, Jianbo Zeng, Fusheng Zhao, Steven Hsesheng Lin, Balakrishnan Raja, Ulrich Strych, Richard C. Willson, and Wei-Chuan Shih*, Label-free, *in situ* SERS monitoring of individual DNA hybridization in microfluidics, *Nanoscale* 6(15), 8521-8526, 2014.
42. Jing Yang, Xuebin Tan, Wei-Chuan Shih, and Mark Cheng, A sandwich substrate for ultrasensitive SERS spectroscopic detection of folic acid / methotrexate, *Biomedical Microdevices* 16(5): 673-679 2014.
43. Fusheng Zhao, Jianbo Zeng, Md Masud Parvez Arnob, Po Sun, Ji Qi, Pratik Motwani, Mufaddal Gheewala, Chien-Hung Li, Andrew Paterson, Uli Strych, Balakrishnan Raja, Richard C. Willson, John C. Wolfe, T. Randall Lee, and Wei-Chuan Shih*, Monolithic NPG nanoparticles with large surface area, tunable plasmonics, and high-density internal hot-spots, *Nanoscale* 6, 8199-8207, 2014.
44. Ji Qi and Wei-Chuan Shih*, Performance of line-scan Raman microscopy for high-throughput chemical imaging of cell population, *Applied Optics* 53(13), 2881-2885, 2014.
45. Ming Li, Jing Lu, Ji Qi, Fusheng Zhao, Jianbo Zeng, Jorn Chi-Chung Yu, and Wei-Chuan Shih*, Stamping surface-enhanced Raman spectroscopy for label-free, multiplexed, molecular sensing and imaging, *Journal of Biomedical Optics* 19(5): 050501, 2014.
46. Gregory M. Santos, Fusheng Zhao, Jianbo Zeng, and Wei-Chuan Shih*, Characterization of nanoporous gold disks for photothermal light harvesting and light-gated molecular release, *Nanoscale* 6(11), 5718-5724, 2014.
47. Ji Qi, Pratik Motwani, Mufaddal Gheewala, Christopher Brennan, John C. Wolfe, and Wei-Chuan Shih*, Surface-enhanced Raman spectroscopy using monolithic nanoporous gold disk substrates, *Nanoscale* 5: 4105-4109, 2013. (Journal cover)
48. Ji Qi, Jingting Li, and Wei-Chuan Shih*, High-speed hyperspectral Raman imaging for label-free

compositional microanalysis, *Biomedical Optics Express* 4(11): 2376-2383, 2013.

49. Ji Qi and Wei-Chuan Shih*, Parallel Raman microspectroscopy using programmable multi-point illumination, *Optics Letters* 37(8): 1289-1291, 2012.
50. Szu-Te Lin, Jack C. Wolfe, John A. Dani, and Wei-Chuan Shih*, Flexible optitrode for localized light delivery and electrical recording, *Optics Letters* 37(11): 1-3, 2012.
51. Albert B. Andrews, Wei-Chuan Shih, Oliver C. Mullins, and N. Koyo, Molecular size determination of coal-derived asphaltene by fluorescence correlation spectroscopy, *Applied Spectroscopy* 65(12): 1348-1356, 2011.

Published before own group

52. Wei-Chuan Shih, Kate L Bechtel and Michael S Feld*, Intrinsic Raman spectroscopy for quantitative biological spectroscopy Part I: Theory and simulations, *Optics Express* 16(17): 12726-12736, 2008.
53. Kate L Bechtel, Wei-Chuan Shih and Michael S. Feld*, Intrinsic Raman spectroscopy for quantitative biological spectroscopy Part II: Experimental applications, *Optics Express* 16(17): 12737-12745, 2008.
54. Wei-Chuan Shih* and Albert B. Andrews, Infrared contrast of crude oil covered water surfaces, *Optics Letters* 33(24): 3019-3021, 2008.
55. Wei-Chuan Shih* and Albert B. Andrews, Thermal infrared contrast of native and crude oil covered water surfaces, *Optics Express* 16(4): 10535-10542, 2008.
56. Wei-Chuan Shih*, Kate L Bechtel and Michael S Feld, Constrained regularization: A new method for multivariate calibration, *Analytical Chemistry* 79(1): 234-239, 2007.
57. Obrad R. Šćepanović, Kate L. Bechtel, Abi S. Haka, Wei-Chuan Shih, Taewoon Koo, Andrew J. Berger, Michael S. Feld*, Determination of uncertainty in parameters extracted from single spectroscopic measurements, *Journal of Biomedical Optics* 12(6), 064012, 2007.
58. Wei-Chuan Shih*, Sang-Gook Kim and George Barbastathis, High resolution electrostatic analog tunable grating with a single-mask fabrication process, *IEEE/ASME Journal of Microelectromechanical Systems* 15(4), pp. 763-769, 2006.
59. Annika Enejder, Tom Scecina, Jeankun Oh, Martin Hunter, Wei-Chuan Shih, Slobadan Sasic, Gary Horowitz and Michael S. Feld*, Raman spectroscopy for non-invasive glucose measurements, *Journal of Biomedical Optics* 10(3), 031114, 2005.
60. Wei-Chuan Shih*, Chee Wei Wong, Yungbae Jeon, Sang-Gook Kim and George Barbastathis, MEMS tunable gratings with analog actuation, *Information Sciences* 149(1-3), 31-40, 2003.

Conference papers/proceedings

1. Label-free biomolecular sensing by SERS on nanoporous gold nanoparticle arrays, IEEE Nano, Cork Ireland, July 2018.
2. Photothermal generation of programmable microbubbles array on nanoporous gold disks, IEEE OMN, Lausanne Switzerland, July 2018.
3. Local refractive index sensitivity of nanoporous gold nanodisk array, OSA Sensors, Zurich Switzerland, July 2018.
4. Hoang Nguyen, MMP Arnob, and Wei-Chuan Shih, Laser micro-ablated multi-point side-firing optical fiber for deep-tissue light delivery, IEEE Photonics Conference, 2017.
5. Camille G Artur, Tasha Womack, Jingting Li, Jason Eriksen, David Mayerich, and Wei-Chuan Shih, Hyperspectral expansion microscopy, IEEE Photonics Conference, 2017.
6. MMP Arnob and Wei-Chuan Shih, 3D plasmonic nanoarchitectures for extreme light concentration, Proc. of SPIE Vol 10346, 1034606, 2017.

7. Ibrahim Misba, Fusheng Zhao, and Wei-Chuan Shih, Tunable gold nanodisks array on flexible substrates, *IEEE Optical MEMS and Nanophotonics*, 1-2, 2017.
8. J Li, F Zhao, WC Shih, Single-molecule DNA hybridization on nanoporous gold nanoparticle array chip, *Proc. of SPIE Vol 10075*, 1007505-1, 2017.
9. J Li, Y Yue, WC Shih, A flexible and rapid frequency selective scheme for SRS microscopy, *Proc. of SPIE Vol 10069*, 1006914-1, 2017.
10. J Li, F Zhao, WC Shih, Laser-assisted dealloying for direct-write patterning of plasmonic nanostructures, *Proc. of SPIE Vol 10115*, 101150K-1, 2017.
11. WC Shih, F Zhao, Surface-enhanced near-infrared absorption on nanoporous gold nanoparticle array chip, *SPIE BiOS*, 1008002-1008002-1, 2017.
12. S Qiu, F Zhao, J Li, WC Shih, Portable SERS sensor for malachite green and other small dye molecules, *Proc. of SPIE Vol 10072*, 1007202-1, 2017.
13. F Zhao, S Qiu, J Li, WC Shih, Sensitive and selective nanoplasmonic sensor by functionalized nanoporous gold nanoparticle array chip, *Proc. of SPIE Vol 10080*, 1008006-1, 2017.
14. Yu-Lung Sung, Fusheng Zhao, Jingting Li, and Wei-Chuan Shih, "Gold nanoparticle decorated AAO filter membrane for SERS sensing of urine acetaminophen," *IEEE Sensors*, Oct 2016.
15. Wei-Chuan Shih, Fusheng Zhao, Ousamma Zenasni, and Masud Arnob, "Surface-enhanced near-infrared absorption (SENIRA) spectroscopy," *IEEE Sensors*, Oct 2016.
16. Fusheng Zhao, Suyan Qiu, and Wei-Chuan Shih, "Nanoplasmonic sensing on DNA topological structure functionalized nanoporous gold disks," *IEEE Optical MEMS and Nanophotonics (OMN)*, Aug 2016.
17. Jingting Li, Ming Li, Yong Du, Gregg M. Santos, Chandra Mohan, Wei-Chuan Shih, "Raman and surface-enhanced Raman spectroscopy for renal condition monitoring," *Proceedings of SPIE*, 2016.
18. Gregg M. Santos, Felipe Ibanez, Fusheng Zhao, Debora Rodrigues, Wei-Chuan Shih, "Photothermal inactivation of bacteria on plasmonic nanostructures," *Proceedings of SPIE*, 2016.
19. Suyan Qiu, Fusheng Zhao, Gregg M. Santos, Wei-Chuan Shih, "Plasmonic biosensor for label-free malachite green detection," *Proceedings of SPIE*, 2016.
20. Jingting Li, Ming Li, Gregg M. Santos, Fusheng Zhao, Wei-Chuan Shih, "Photothermal generation of microbubbles on plasmonic nanostructures for flow manipulation inside microfluidic channels," *Proceedings of SPIE*, 2016.
21. Gauri Bhave, Fusheng Zhao, Jingting Li, and Wei-Chuan Shih, "Wavelength tunable plasmon enhanced photoluminescence from quantum dots", *IEEE Optical MEMS and Nanophotonics (OMN)*, Aug 2015.
22. Masud Arnob, Fusheng Zhao, and Wei-Chuan Shih, "Modeling Nanoporous Gold Plasmonic Nanoparticles: Calculation of Optical Properties", *IEEE NANO*, Jul 2015.
23. Fusheng Zhao, Jianbo Zeng, Masud Arnob, Gregg Santos, Wei-Chuan Shih, "Monolithic nanoporous gold disks with large surface area and high-density plasmonic hot-spots", in *Plasmonics in Biology and Medicine XII*, Tuan Vo-Dinh; Joseph R. Lakowicz, Editors, *Proceedings of SPIE Vol. 9340* (SPIE, Bellingham, WA 2015), 93400B.
24. Ming Li, Yong Du, Fusheng Zhao, Jianbo Zeng, Gregg Santos, Chandra Mohan, Wei-Chuan Shih, "Stamping SERS for creatinine sensing", in *Plasmonics in Biology and Medicine XII*, Tuan Vo-Dinh; Joseph R. Lakowicz, Editors, *Proceedings of SPIE Vol. 9340* (SPIE, Bellingham, WA 2015), 934004.
25. Ji Qi, Jianbo Zeng, Fusheng Zhao, Gregg Santos, Steven Lin, Balakrishnan Raja, Ulrich Strych, Richard Willson, Wei-Chuan Shih, "Label-free monitoring of individual DNA hybridization using SERS", in *Nanoscale Imaging, Sensing, and Actuation for Biomedical Applications XII*, Alexander N. Cartwright; Dan V. Nicolau, Editors, *Proceedings of SPIE Vol. 9337* (SPIE, Bellingham, WA 2015), 93370D.
26. Ming Li, Fusheng Zhao, Jianbo Zeng, Gregg Santos, Wei-Chuan Shih, "Label-free, multiplexed, molecular sensing and imaging by stamping SERS", in *Optical Diagnostics and Sensing XV: Toward Point-of-Care Diagnostics*, Gerard L. Coté, Editors, *Proceedings of SPIE Vol. 9332* (SPIE, Bellingham, WA 2015), 93320E.

27. Ji Qi, Narendran Sudheendran, Chih Hao Liu, Greggy Santos, Eric D. Young, Alexander Lazar, Dina Lev, Raphael Pollock, Kirill V. Larin, Wei-Chuan Shih, "Raman spectroscopy complements optical coherent tomography in tissue classification and cancer detection", in *Optical Biopsy XIII: Toward Real-Time Spectroscopic Imaging and Diagnosis*, Robert R. Alfano; Stavros G. Demos, Editors, Proceedings of SPIE Vol. 9318 (SPIE, Bellingham, WA 2015), 931807.
28. Ming Li, Fusheng Zhao, Jianbo Zeng, Greggy Santos, Wei-Chuan Shih, "Monolithically integrated microfluidic nanoporous gold disk (NPGD) surface-enhanced Raman scattering (SERS) sensor for rapid and label-free biomolecular detection", in *Microfluidics, BioMEMS, and Medical Microsystems XIII*, Bonnie L. Gray; Holger Becker, Editors, Proceedings of SPIE Vol. 9320 (SPIE, Bellingham, WA 2015), 93200K.
29. Greggy M. Santos, Fusheng Zhao, Jianbo Zeng, Wei-Chuan Shih, "Photothermal light harvesting and light-gated molecular release by nanoporous gold disks", in *Dynamics and Fluctuations in Biomedical Photonics XII*, Valery V. Tuchin; Kirill V. Larin; Martin J. Leahy; Ruikang K. Wang, Editors, Proceedings of SPIE Vol. 9322 (SPIE, Bellingham, WA 2015), 93220J.
30. Szu-Te Lin; Mufaddal Gheewala; John A Dani; John C Wolfe; Wei-Chuan Shih, "Flexible optitrode for localized light delivery and electrical recording," *Proc. SPIE 8565*, Photonic Therapeutics and Diagnostics IX, 85655Y (8 March 2013); doi: 10.1117/12.2005707.
31. Ji Qi, Pratik Motwani, John C Wolfe and Wei-Chuan Shih, "Monolithic porous gold nanostructures as surface-enhanced Raman spectroscopy substrates for molecular and biosensing," *Proc. SPIE 8597*, Plasmonics in Biology and Medicine X, 85970I (February 21, 2013); doi:10.1117/12.2005727.
32. Ji Qi and Wei-Chuan Shih, "Sparse-sampling parallel Raman/SERS microspectroscopy for high-throughput molecular analysis of micro and nanoparticles," *Proc. SPIE 8587*, Imaging, Manipulation, and Analysis of Biomolecules, Cells, and Tissues XI, 85871N (February 22, 2013); doi:10.1117/12.2005718.
33. Ji Qi, Pratik Motwani, John C Wolfe and Wei-Chuan Shih, "High throughput Raman and surface-enhanced Raman microscopy," *Proc. SPIE 8219*, Biomedical Vibrational Spectroscopy V: Advances in Research and Industry, 821903 (February 9, 2012); doi:10.1117/12.908971.
34. Yingying Li, Wei-Chuan Shih, Zhu Han and Wotao Yin, "Oil spill sensor using multispectral infrared imaging via l1 minimization," *ICASSP*, Prague CZ, May 2011, DOI: 10.1109/ICASSP.2011.5946670.
35. Szu-Te Lin, Mufaddal Gheewala, John C Wolfe, John A Dani and Wei-Chuan Shih, "A flexible optrode for deep brain neurophotonics," *IEEE/EMBS International Conference on Neural Engineering*, Cancun, Mexico, May 2011, DOI: 10.1109/NER.2011.5910644.
36. Wei-Chuan Shih, A Ballard Andrews and Matthew Clayton, "Offshore stand-off oil spill monitoring using passive optical imaging," *Proc. SPIE 7312*, Advanced Environmental, Chemical, and Biological Sensing Technologies VI, 73120V (1 May 2009); doi: 10.1117/12.818738.
37. Wei-Chuan Shih, Kate L Bechtel and Michael S Feld, "Intrinsic Raman spectroscopy improves analyte concentration measurements in turbid media," *Biomedical Optics Topical Meeting by Optical Society of America*, Fort Lauderdale, FL, Mar 2006; DOI: 10.1364/BIO.2006.MC7.
38. Wei-Chuan Shih, Carlos Hidrovo, Sang-Gook Kim and George Barbastathis, "Optical diversity by nanoscale actuation," *IEEE NANO*, San Francisco CA, 2003.
39. Wei-Chuan Shih, Chee Wei Wong, Yong Bae Jeon, Sang-Gook Kim and George Barbastathis "Electrostatic and piezoelectric analog tunable diffractive gratings," *Lasers and Electro-Optics (CLEO)*, Long Beach CA, May 2002; DOI: 10.1109/CLEO.2002.1033451.
40. Wei-Chuan Shih, Chee Wei Wong, Yong Bae Jeon, Sang-Gook Kim, Martin A Schmidt, Salil Desai, Dennis M Freeman, Arnab Sinha, Gregory Nielson, and George Barbastathis, "Analog tunable diffractive grating with milliradian resolution," *Optical Fiber Communication Conference (OFC)*, Anaheim CA, Mar 2002; DOI: 10.1109/OFC.2002.1036296.

Patents

1. Fabrication and applications of multiple side-window, side-firing optical fiber (Non-provisional application)

- Inventor: **Wei-Chuan Shih** and Hoang Nguyen; Assignee: U. Houston
2. Direct-write patterning of nanoporous gold microstructures by in situ laser-assisted dealloying (Non-provisional application)
Inventor: **Wei-Chuan Shih** and Jingting Li; Assignee: U. Houston
 3. US9995851, Fabrication of lenses by droplet formation on a pre-heated surface (Issued)
Inventor: **Wei-Chuan Shih** and Yulung Sung; Assignee: U. Houston
 4. 62004131, Nanoporous gold and silver nanoparticles and substrates for biomolecular sensing (Non-provisional application)
Inventor: **Wei-Chuan Shih** and Richard C Willson; Assignee: U. Houston
 5. US9546958, Method of stamping surface-enhanced Raman spectroscopy for label-free, multiplexed, molecular sensing and imaging
Inventor: **Wei-Chuan Shih** and Ming Li; Assignee: U. Houston
 6. US986914 Method of fabricating a probe (issued)
Inventor: John C Wolfe, Mufaddal Gheewala, **Wei-Chuan Shih**; Assignee: U. Houston
 7. US9873152 Nanoporous gold nanoparticles as high-payload molecular cargos, photothermal/photodynamic therapeutic agents, and ultrahigh surface-to-volume plasmonic sensor (issued)
Inventor: **Wei-Chuan Shih**; Assignee: U. Houston
 8. US9103793 Intrinsic Raman spectroscopy (Issued)
Inventors: KL Bechtel, MS Feld, and **Wei-Chuan Shih**; Assignee: MIT
 9. US8902421 Method and system for active-illumination parallel Raman microspectroscopy (Issued)
Inventors: **Wei-Chuan Shih**; Assignee: U. Houston
 10. US8661663 Method for manufacturing a multimodal neural probe (Issued)
Inventors: John C Wolfe and **Wei-Chuan Shih**; Assignee: U. Houston
 11. US6975459 Micro-actuated adaptive diffractive composites (Issued)
Inventors: G Barbastathis, SG Kim, **Wei-Chuan Shih**, CW Wong, YB Jeon; Assignee: MIT
 12. US8124931 Method and apparatus for oil spill detection (Issued)
Inventors: AB Andrews, **Wei-Chuan Shih**, M Clayton, OC Mullins; Assignee: Schlumberger
 13. US8362429 Method and apparatus for oil spill detection (Issued)
Inventors: AB Andrews, **Wei-Chuan Shih**, M Clayton, OC Mullins; Assignee: Schlumberger
 14. US 8355767 Raman spectroscopy for non-invasive glucose measurements (Issued)
Inventors: M Hunter, A Enejder, T Scecina, MS Feld, **Wei-Chuan Shih**; Assignee: MIT

Invited Seminar Talks

1. “Optical devices and techniques for chemical/biological sensing and imaging” University of St. Andrews, St. Andrews UK, July 2018.
2. “Nanobiophotonic meta-surfaces and devices for human health and environmental monitoring” Beijing Institute of Technology, Beijing China, May 2018.
3. “Enabling optical elements for emerging science and technology” University of Texas, Arlington, Apr 2018.
4. “Enabling optical elements for emerging science and technology” University of Victoria, Mar 2018.

5. "Enabling optical elements for emerging science and technology" University of British Columbia/BC Cancer Agency, Mar 2018.
6. "Enabling optical elements for emerging science and technology" University of Iowa, Jan 2018.
7. "Ensemble plasmonic coupling in disordered arrays and applications in biosensing and imaging" National University of Singapore, Jul 2017.
8. "Advances in chem/biosensing and imaging: nano-material, micro-device, macro-system," Department of Electrical and Computer Engineering, George Washington U., May 2017.
9. "3D plasmonic nanoarchitectures for chemical and biosensing," School of Electronic and Electrical Engineering, Nanyang Technological U., Jan 2017.
10. "3D plasmonic nanoarchitectures for chemical and biosensing," Department of Optoelectronics Engineering, National Sun Yat Sen U., Dec 2016.
11. "Nanoplasmic sensors for chem/bio and wearable applications," Research Center of Applied Sciences, Academia Sinica, Dec 2016.
12. "Nanoplasmic sensors for chem/bio and wearable applications," Jiangxi Academy of Agricultural Sciences, Dec 2016.
13. "Nanoplasmic sensors for chem/bio and wearable applications," Institute of Atomic and Molecular Sciences, Academia Sinica, Dec 2016.
14. "3D plasmonic nanoarchitectures for chemical and biosensing," Department of Optoelectronics, National Taiwan University, Dec 2016.
15. "3D plasmonic nanoarchitectures for chemical and biosensing," University of Cincinnati, Nov 2016.
16. "Non-invasive glucose sensing," Samsung Advanced Institute of Technology, Seoul, Oct 2016.
17. "Opto-Analytical Spectroscopy, Imaging, and Sensing (OASIS)," Korea Research Institute of Chemical Technology, Oct 2016.
18. "Opto-Analytical Spectroscopy, Imaging, and Sensing (OASIS)," Pohang University of Science and Technology (POSTECH), Oct 2016.
19. "Opto-Analytical Spectroscopy, Imaging, and Sensing (OASIS)," Korea Advanced Institute of Science and Technology (KAIST), Oct 2016.
20. "Opto-Analytical Spectroscopy, Imaging, and Sensing (OASIS)," Korea University, Oct 2016.
21. "Opto-Analytical Spectroscopy, Imaging, and Sensing (OASIS)," Center of Nano Science and Technology, NIST, Sep 2016.
22. "Opto-Analytical Spectroscopy, Imaging, and Sensing (OASIS)," Department of Materials Science and Engineering, Nanyang Technological University, Aug 2016.
23. "Opto-Analytical Spectroscopy, Imaging, and Sensing (OASIS)," National University of Singapore, Aug 2016.
24. "Opto-Analytical Spectroscopy, Imaging, and Sensing (OASIS)," Optical Science and Technology Center, University of Iowa, Apr 2016.
25. "Opto-Analytical Sensing, Imaging, and Stimulation (OASIS)," Department of Electrical and Computer Engineering, North Carolina State University, Mar 2016.
26. "Opto-Analytical Sensing, Imaging, and Stimulation (OASIS)," Department of Mechanical Engineering, Columbia University, Feb 2016.
27. "Opto-Analytical Sensing, Imaging, and Stimulation (OASIS)," OSA Chapter, Rice University, Feb 2015.
28. "Opto-Analytical Sensing, Imaging, and Stimulation (OASIS)," School of Dentistry, University of Texas Health, Jan 2016.

29. "Opto Analytical Sensing, Imaging, and Stimulation," Neural Engineering Workshop, Rice University, Oct 2015.
30. "Light-based molecular sensing and imaging for translational biophotonics," Seminar, CREOL, University of Central Florida, Apr. 2015.
31. "Novel Nanomaterials and Instruments for Translational Biophotonics Applications," Seminar, ECE Department, University of Minnesota, Feb. 2015.
32. "Novel plasmonic nanomaterials and instruments for biomedical applications," Workshop on Light-Driven Processes in Bio-Inspired Materials, Rice University, Huston TX, Dec. 2014.
33. "Mesoporous plasmonic nanoparticles for Biomedical Applications," Department of Biomedical Engineering, Johns Hopkins University, Baltimore MD, Jul. 2014.
34. "Mesoporous plasmonic nanoparticles for Biomedical Applications," National Institute of Aging, National Institute of Health, Baltimore MD, Jul. 2014.
35. "Mesoporous plasmonic nanoparticles for sensing and imaging," Department of Photonics, National Jiao Tung University, Hsinchu Taiwan, Jun. 2014.
36. "Mesoporous plasmonic nanoparticles," Department of Mechanical and Automation Engineering and Department of Physics, Chinese University of Hong Kong, HK SAR China, Jun. 2014.
37. "Biomimetic plasmonic quasi nanocrystals," Fitzpatrick Center of Photonics, Duke University, Durham NC, Apr. 2014.
38. "Label-free molecular sensing using Raman and SERS," Department of Electrical and Computer Engineering, University of Texas at Arlington, Arlington TX, Mar. 2014.
39. "Label-free molecular sensing using Raman and SERS," Department of Electrical and Computer Engineering, Wayne State University, Detroit MI, Nov. 2013.
40. "Novel microscopy instrument and nanostructured substrates for plasmonic molecular sensing and imaging," Department of Electrical and Computer Engineering, University of Nevada at Reno, Reno NV, Feb. 2013.
41. "Photonic technologies for molecularly-specific sensing, imaging and stimulation," Department of Chemistry, University of California at Santa Cruz, Santa Cruz CA, Feb. 2013.
42. "Photonic technologies for molecularly-specific sensing, imaging and stimulation," Department of Biomedical Engineering, Vanderbilt University, Nashville TN, May 2013.
43. "Photonic technologies for molecularly-specific sensing, imaging and stimulation," Department of Mechanical Engineering, Virginia Commonwealth University, Richmond VA, Oct. 2012.
44. "Photonic technologies for molecularly-specific sensing, imaging and stimulation," Department of Biomedical Engineering, Texas A&M University, College Station TX, Sept. 2012.
45. "Quantitative Bio Raman Spectroscopy and Imaging", Department of Mechanical Engineering, University of Houston, Houston TX, Jan. 2011.
46. "Toward integrated sensing and diagnosis," Schlumberger, Sugar Land TX, Jun. 2010.
47. "Toward integrated sensing and diagnosis," Department of Electrical Engineering, National Taiwan University, Taipei Taiwan, Jan. 2010.
48. "Toward integrated sensing and diagnosis," Department of Mechanical Engineering, National Chiao Tung University, Hsin-Chu Taiwan, Jan. 2010.
49. "Optical sensing and Micro/Nanotechnology," Schlumberger, Sugar Land TX, May 2009.
50. "Toward intelligent optical sensing and diagnosis," Department of Electrical and Computer Engineering, University of Houston, Houston TX, Mar. 2009.
51. "Toward intelligent optical sensing and diagnosis," Department of Mechanical and Automation Engineering, Chinese University of Hong Kong, HK SAR China, Feb. 2009.

52. "Toward intelligent optical sensing and diagnosis," Department of Mechanical Engineering, Hong Kong University, HK SAR China, Feb. 2009.
53. "Label-free, non-invasive sensing and diagnosis using optical spectroscopy," Department of Biomedical Engineering, Rensselaer Polytechnic Institute, Oct. 2008.
54. "How sweet are you?," Department of Electrical and Computer Engineering, University of Minnesota, Feb. 2008.
55. "Quest for carbohydrates and hydrocarbons," Department of Electrical and Computer Engineering, Tufts University, Jan. 2008.
56. "Quantitative biological Raman spectroscopy," MIT Modern Optics and Spectroscopy (MOS) Seminar, Massachusetts Institute of Technology, Cambridge MA, Mar. 2006.
57. "Diffractive optical elements with analog micromechanical actuation," MIT Microphotonics Center, Cambridge, MA, Apr. 2002.

Conference co-chair/committee

IEEE NANOMED Program Co-Chair, 2016

META'16 Special Session Organizer

IEEE Optical MEMS and Nanophotonics, Technical Program Committee (2017-)

ASME International Design Engineering Technical Conference, Symposium Chair (2014-2015)

SPIE Photonics West: Plasmonics in Biology and Medicine VII (2013-)

SPIE Translational Biophotonics (2016-)

Presentations at Conferences

1. "Label-free biomolecular sensing by SERS on nanoporous gold nanoparticle arrays," IEEE Nano, Cork Ireland, July 2018.
2. "Photothermal generation of programmable microbubbles array on nanoporous gold disks," IEEE OMN, Lausanne Switzerland, July 2018.
3. "Local refractive index sensitivity of nanoporous gold nanodisk array," OSA Sensors, Zurich Switzerland, July 2018.
4. (Invited Talk) "Robust and high-efficiency photothermal conversion on nanoporous gold disk array for sensing and actuation applications," SPIE OTA, Beijing China, May 2018.
5. (Invited Talk) "Ensemble plasmonic coupling in disordered arrays and applications in biosensing and super-resolution histopathology," SPIE DCS, Orlando FL, Apr 2018.
6. (Invited Talk) "Far-field and near-field plasmonic coupling in disordered nanoparticle arrays and applications in ultra-sensitive biosensing and super-resolution histopathology," SciX, Reno NV, Oct 2017.
7. (Invited Talk) "Scalable nanofabrication of cost-effective 3D plasmonic chips for point-of-care applications," SciX, Reno NV, Oct 2017.
8. (Invited Talk) "3D plasmonic nanoarchitectures for chemical and biosensing," SPIE Optics & Photonics, San Diego CA, Aug 2017.
9. (Invited Talk) "Cost-effective plasmonic nanosurface and polymer lens for chemical and biosensing," ECI Advances in Optics for Biotechnology, Medicine and Surgery, Snowmass CO, Jul 2017.
10. (Invited Talk) "Nanoporous gold array: a versatile plasmonic chip for high-performance surface-enhanced spectroscopy and analytical sensing," PittCon, Chicago IL, Mar 2017.
11. (Invited Talk) "Characterization and applications of nanoporous gold array in the near-infrared," ACS Southwest Regional Conference, Galveston TX, Nov 2016.
12. (Invited Talk) "Molecular fingerprinting on arbitrary surfaces and flexible substrates using surface-enhanced spectroscopy and imaging," ACS Southwest Regional Conference, Galveston TX, Nov 2016.
13. (Podium) IEEE Sensors, Orlando FL, Oct 2016.
14. (Podium) IEEE Sensors, Orlando FL, Oct 2016.

15. (Invited Talk) "Hyperspectral Raman microscopy enables robust and flexible molecular sensing and imaging on nanoporous gold nanoparticles," SciX/FACSS, Minneapolis MN, Sept 2016.
16. (Invited Talk) "Characterization and applications of nanoporous gold nanoparticles in the near-infrared," SciX/FACSS, Minneapolis MN, Sept 2016.
17. (Invited Talk) "Plasmon-enhanced molecular sensing and imaging on nanoporous gold disks," META, Malaga Spain, Jul 2016.
18. (Poster) "Microfluidic label-free monitoring of DNA hybridization," *SPIE Translational Biophotonics*, Houston TX, May 2016.
19. (Oral) "A label-free SERS sensing platform for telomerase activity detection," SPIE Translational Biophotonics, Houston TX, May 2016.
20. (Poster) "Monitoring adsorption of gold nanoparticles on electron-beam lithography patterned gold nanodisks using dark-field hyperspectral microscopy," *SPIE Translational Biophotonics*, Houston TX, May 2016.
21. (Poster) "Plasmonic nanocomposite platform for biosensing application," *SPIE Translational Biophotonics*, Houston TX, May 2016.
22. (Poster) "Disposable lens for smartphone microscopy," *SPIE Translational Biophotonics*, Houston TX, May 2016.
23. (Poster) "Photothermal inactivation of heat-resistant bacteria on nanoporous gold disk arrays," *SPIE Translational Biophotonics*, Houston TX, May 2016.
24. (Poster) "Dual-wavelength line-scan Raman microscopy for label-free molecular imaging," *SPIE Translational Biophotonics*, Houston TX, May 2016.
25. (Poster) "Bio-inspired, low-cost plasmonic substrates for surface-enhanced Raman spectroscopy (SERS)," *SPIE Translational Biophotonics*, Houston TX, May 2016.
26. (Poster) "A flexible and rapid frequency selective scheme for SRS microscopy," *SPIE Translational Biophotonics*, Houston TX, May 2016.
27. (Poster) "Fabrication of multi-point side-firing optical fiber by laser micromachining," *SPIE Translational Biophotonics*, Houston TX, May 2016.
28. (Oral) "Aryl bithiolate functionalized plasmonic nanoporous discs: New direction for detecting polycyclic aromatic hydrocarbons using surface-enhanced Raman spectroscopy" 251st ACS National Meeting, San Diego, CA, March 2016.
29. (Talk) "Raman and surface-enhanced Raman spectroscopy for renal condition monitoring", SPIE Photonics West Feb 2016.
30. (Talk) "Plasmonic biosensor for label-free malachite green detection", SPIE Photonics West Feb 2016.
31. (Invited Talk) "Porous plasmonic nanostructures for bio applications", IEEE NANOMED, Honolulu HI, Nov 2015.
32. (Invited Talk) "Raman and surface-enhanced Raman spectroscopy for kidney disease diagnosis", IEEE NANOMED, Honolulu HI, Nov 2015.
33. (Invited Talk) "Light-based molecular sensing and imaging for translational biophotonics", IEEE NANOMED, Honolulu HI, Nov 2015.
34. (Talk) "Wavelength tunable plasmon enhanced photoluminescence from quantum dots", IEEE Optical MEMS and Nanophotonics (OMN) Jerusalem Israel, Aug 2015.
35. (Talk) "Modeling Nanoporous Gold Plasmonic Nanoparticles: Calculation of Optical Properties", IEEE NANO, Rome Italy, Jul 2015.
36. (Talk) "Monolithic nanoporous gold disks with large surface area and high-density plasmonic hot-spots", in Plasmonics in Biology and Medicine XII, SPIE Photonics West Feb 2015.
37. (Talk) "Stamping SERS for creatinine sensing", in Plasmonics in Biology and Medicine XII, SPIE Photonics West Feb 2015.
38. (Talk) "Label-free monitoring of individual DNA hybridization using SERS", in Nanoscale Imaging, Sensing, and Actuation for Biomedical Applications XII, SPIE Photonics West Feb 2015.

39. (Talk) "Label-free, multiplexed, molecular sensing and imaging by stamping SERS", in Optical Diagnostics and Sensing XV: Toward Point-of-Care Diagnostics, SPIE Photonics West Feb 2015.
40. (Talk) "Raman spectroscopy complements optical coherent tomography in tissue classification and cancer detection", in Optical Biopsy XIII: Toward Real-Time Spectroscopic Imaging and Diagnosis, SPIE Photonics West Feb 2015.
41. (Talk) "Monolithically integrated microfluidic nanoporous gold disk (NPGD) surface-enhanced Raman scattering (SERS) sensor for rapid and label-free biomolecular detection", in Microfluidics, BioMEMS, and Medical Microsystems XIII, SPIE Photonics West Feb 2015.
42. (Invited Talk) "Photothermal light harvesting and light-gated molecular release by nanoporous gold disks", in Dynamics and Fluctuations in Biomedical Photonics XII, SPIE Photonics West Feb 2015.
43. (Talk) "Nanoporous gold nanoparticles for light harvesting and photothermal conversion," *ASME International Design Congress*, Buffalo NY, Aug. 2014.
44. (Invited Talk) "Hierarchical porous plasmonic Au nanostructures," 12th *International Conference on Photonics and Imaging in Biology and Medicine (PIBM)*, Wuhan China, Jun. 2014 (invited).
45. (Poster) "Hyperspectral Raman imaging (HSRI) for multiplexed molecular imaging," *SPIE Translational Biophotonics*, Houston TX, May 2014.
46. (Poster) "Microfluidic label-free monitoring of DNA hybridization," *SPIE Translational Biophotonics*, Houston TX, May 2014.
47. (Poster) "Monolithic nanoporous gold disks with large specific surface area, tunable plasmon resonance, and high-density, internal plasmonic hot-spots," *SPIE Translational Biophotonics*, Houston TX, May 2014.
48. (Poster) "Nanoporous gold disks for photothermal light harvesting and light-gated molecular release,"
49. (Poster) "Improvement of tissue analysis and classification using optical coherence tomography combined with Raman spectroscopy," *SPIE Translational Biophotonics*, Houston TX, May 2014.
50. (Poster) "Surface-enhanced Raman spectroscopy for label-free, multiplexed, molecular sensing and imaging," *SPIE Translational Biophotonics*, Houston TX, May 2014.
51. (Talk) "Integrated neural probe for localized light delivery and electrical recording," *SPIE Photonics West*, San Francisco CA, Jan. 2014.
52. (Talk) "Ultrasensitive DNA hybridization monitoring on nanoporous gold disks in microfluidics," *SPIE Photonics West*, San Francisco CA, Jan. 2014.
53. (Talk) "Hyperspectral Raman imaging (HSRI) by active-illumination for molecular imaging," *SPIE Photonics West*, San Francisco CA, Jan. 2014.
54. (Talk) "Label-free molecular sensing by SERS on nanoporous gold substrates," *SPIE Photonics West*, San Francisco CA, Jan. 2014.
55. (Talk) "Monolithic nanoporous gold as plasmonic substrates for surface studies," *ASME International Design Congress*, Portland OR, Aug. 2013.
56. (Talk) "Monolithic Nanoporous Gold Disks as Surface-Enhanced Raman Scattering Substrates," *OSA Sensors*, Rio Grande PR, Jul. 2013.
57. (Poster) "Scan-less hyperspectral raman imaging (HSRI) by active-illumination for sers-based multiplexed molecular imaging," *ECI Advances in Optics for Biotechnology, Medicine and Surgery XIII*, Lake Tahoe, Jun 2013.
58. (Poster) "Microfluidic label-free monitoring of DNA hybridization," *ECI Advances in Optics for Biotechnology, Medicine and Surgery XIII*, Lake Tahoe, Jun 2013.
59. (Poster) "Active-illumination parallel Raman/SERS imaging," *Electron, ion, and photon beam and nanofabrication*, Nashville TN, May 2013.
60. (Poster) "Surface-enhanced Raman Spectroscopy with monolithic, hierarchical nanoporous gold disk substrates," *Electron, ion, and photon beam and nanofabrication*, Nashville TN, May 2013.

61. (Talk) "Flexible optitrode for localized light delivery and electrical recording," *SPIE Photonics West*, San Francisco CA, Jan. 2013.
62. (Talk) "Sparse-sampling parallel Raman/SERS microspectroscopy for high-throughput molecular analysis of micro and nanoparticles," *SPIE Photonics West*, San Francisco CA, Jan. 2013.
63. (Talk) "Monolithic porous gold nanostructures as surface-enhanced Raman spectroscopy substrates for molecular and biosensing," *SPIE Photonics West*, San Francisco CA, Jan. 2013.
64. (Talk) "Molecularly-specific sensing, imaging and stimulation," Annual Symposium of Center of NeuroEngineering, Rice University, Houston TX, Sept. 2012.
65. (Talk) "Parallel Raman and surface-enhanced Raman microspectroscopy," *Society of Applied Spectroscopy Annual Meeting (FACSS/SCIX)*, Kansas City MO, Sept. 2012.
66. (Talk) "Monolithic nanoporous gold disks as surface-enhanced Raman scattering substrates," *Society of Applied Spectroscopy Annual Meeting (FACSS/SCIX)*, Kansas City MO, Sept. 2012.
67. (Invited Talk) "Parallel Raman and surface-enhanced Raman microspectroscopy for biophotonics applications," *International Conference and exhibition on Biosensor and Bioelectronics*, Las Vegas NV, May 2012.
68. (Invited Talk) "Flexible optitrode for localized light delivery and electrical recording," *International Conference and exhibition on Biosensor and Bioelectronics*, Las Vegas NV, May 2012.
69. (Invited Talk) "Detection of organic gunshot residues by surface-enhanced Raman scattering spectroscopy," *PittCon*, Orlando FL, Mar 2012.
70. (Poster) "3D HOT Raman," *PittCon*, Orlando FL, Mar 2012.
71. (Talk) "Integrated multi-sensing optrode for neural stimulation and recording," *SPIE Photonics West*, San Francisco CA, Jan. 2012.
72. (Talk) "High-throughput Raman and surface-enhanced Raman microscopy," *SPIE Photonics West*, San Francisco CA, Jan. 2012.
73. (Poster) "Integrated multi-sensing optrode for neural stimulation and recording," *Society for Neuroscience Annual Meeting*, San Diego CA, Oct. 2011.
74. (Poster) "High throughput chemical imaging of living cells," *Advances in Optics for Biotechnology, Medicine and Surgery, Engineering Conference International*, Naples FL, Jun. 2011.
75. (Poster) "Oil spill sensor using multispectral infrared imaging via l1 minimization," *International Conferences on Acoustics, Speech and Signal Processing (ICASSP)*, Prague Czech Republic, May 2011.
76. (Talk) "A flexible optrode for deep brain neurophotonics," *IEEE International Conference on Neural Engineering*, Cancun Mexico, Apr. 2011.
77. (Poster) "Fabrication of 3D multisensing electrodes for in vivo neuronal unit recordings", *Society for Neuroscience Annual Meeting*, San Diego CA, Oct. 2010.
78. (Talk) "Offshore stand-off oil spill monitoring using passive optical imaging," *SPIE Symposium on Defense, Security, and Sensing*, Orlando, FL, Apr. 2009.
79. (Invited Talk) "Automated remote monitoring system for offshore platforms," *Schlumberger Reservoir Symposium*, Rio de Janeiro Brazil, Oct. 2008.
80. (Talk) "Oil spill detection," *Federation of Analytical Chemistry and Spectroscopy Society (FACSS)*, Reno NV, Sept. 2008.
81. (Talk) "Oil spill detection using multiple spectral bands," *IEEE International Geoscience & Remote Sensing Symposium (IGARSS)*, Boston MA, Jul. 2008.
82. (Talk) "Modeling of thickness dependent thermal contrast of native and crude oil covered water surfaces," *IEEE International Geoscience & Remote Sensing Symposium (IGARSS)*, Boston MA, Jul. 2008.

83. (Talk) “Quantitative Raman spectroscopy in turbid media: Theory and simulations,” *Federation of Analytical Chemistry and Spectroscopy Society (FACSS)*, Memphis TN, Oct. 2007.
84. (Poster) “Raman intensity correction in turbid media,” *Gordon Research Conference: Laser in Medicine and Biology*, Holderness NH, Aug. 2006.
85. (Talk) “Intrinsic Raman spectroscopy improves analyte concentration measurements in turbid media,” *Biomedical Optics Topical Meeting by Optical Society of America*, Fort Lauderdale FL, Mar. 2006.
86. (Poster) “Non-invasive determination of blood glucose concentration using NIR transcutaneous Raman spectroscopy,” *Advances in Optics for Biotechnology, Medicine and Surgery*, Copper Mountain CO, Aug. 2005.
87. (Poster) “Constrained regularization: A new strategy for accurate measurement of glucose concentrations in human volunteers using transcutaneous Raman spectroscopy,” *Federation of Analytical Chemistry and Spectroscopy Society (FACSS)*, Quebec City Canada, Oct. 2005.
88. (Invited Talk) “Non-invasive blood analyte concentration measurements using Raman spectroscopy and integrated microspectrometer by nano-actuation,” *New England Section of the Optical Society of America*, Lexington, MA, Nov. 2004 (Invited).
89. (Invited Talk) “Microspectrometer without moving parts,” *OSA Annual meeting*, Orlando, FL, Sept. 2002 (invited).
90. (Poster) “Analog tunable gratings with nanometer resolution,” *Solid-state Sensor and Actuator Workshop*, Hilton Head SC, Jun. 2002.
91. (Invited Talk) “MEMS tunable gratings with analog actuation,” *Symposium on photonics, networking, and computing*, Durham NC, Mar. 2002.
92. (Talk) “Electrostatic and piezoelectric analog tunable diffractive gratings,” *Lasers and Electro-Optics (CLEO)*, Long Beach CA, May 2002.
93. (Talk) “Analog tunable diffractive grating with milliradian resolution,” *Optical Fiber Communication Conference and Exhibit (OFC)*, Anaheim CA, Mar. 2002.

Mentees

List of mentees (*Underrepresented group; **Female)

PhD students:

Ji Qi^{**}, PhD student, 2010-2014 (Schlumberger).
 Pratik Motwani, PhD student, 2010-2015 (Intel).
 Lanchao Liu, PhD student, 2011-2015 (Cisco).
 Mufaddal Gheewala, PhD student, 2009-2013 (Intel).
 Fusheng Zhao, PhD student, 2012-2017 (Chinese Academy of Science).
 Jingting Li^{**}, PhD student, 2012-2017 (Chinese data mining industry).
 Yulung Sung, PhD student, 2013-present (Intel).
 Masud Arnob, PhD student, 2013-2017 (Intel).
 Hoang Nguyen, PhD student, 2015-present.
 Ibrahim Misba, 2016-present.
 Jong-Moon Lee, 2017-present.
 Dilani Gunawarda^{**}, 2017-present.
 Jing Lu^{**}, PhD student, 2012-2013.
 Szu-Te Lin, PhD student, 2010-2014.

Postdocs:

Dr. Camille Artur^{**}, Postdoc (9/2016-4/2018)
 Dr. Jianbo Zeng, Postdoc (12/2012-3/2015) (Clariant).
 Dr. Greggy Santos, Postdoc (6/2013-6/2016).
 Dr. Oussama Zenasni, Postdoc (1/2015-8/2016).
 Dr. Suyan Qiu^{**}, Postdoc (1/2015-8/2016).

Dr. Yuankai Yue, Postdoc (7/2015-7/2016).
Dr. Siva Kund, Postdoc (9/2015-11/2015).
Dr. Gauri Bhav^{**}, Postdoc (1/2015-6/2015).
Dr. Rui Lu, Postdoc (1/2015-8/2015).
Dr. Ming Li^{**}, Postdoc (9/2013-11/2014).
Dr. Po Sun, Postdoc (12/2012-5/2013).
Dr. Jinwei Li, Postdoc (12/2012-5/2013).

Visiting scholars:

Dr. Siming Li, Jiangxi Academy of Agricultural Sciences (8/2017-8/2018)
Prof. Zhicheng Zhong, Jilin University (2/2015-2/2016).

MS student:

Abhishek-Reddy Pamu (9/2009-2/2010).
Radhika Gupta^{**} (9/2015-6/2016).

Undergraduate researchers:

Xiaosi Zhang^{**}, Summer intern (HUST), 7/2017-10/2017.
Ryan San Miguel, NSF REU, summer 2017.
William Payne, NSF REU, summer 2017.
Ashita Bhojwani, NSF REU, summer 2017.
Mariam Malik^{**}, Intern student (University of Houston), 2016.
Zhenyu Hu, SURF/PURS scholar, 2015-2016.
Fernando Campa^{*}, NSF REU (UT Arlington), 2016.
Kelly O'Shaughnessy^{**}, NSF REU (University of Cincinnati), 2016
Ze Wang, Summer intern (HUST), 2015.
Ming Do^{**}, NSF REU (University of Houston), 2015.
Ali Tejani, NSF REU (UT Austin), 2015.
Jake Goran, Summer intern (U of Arizona), 2015.
Cesar Figueroa^{**}, SURF/PURS scholar, (University of Houston), 2010-2013.
Emery Annis, PURS scholar (University of Houston), 2012-2013
Shivali Narang^{**}, UG researcher (University of Houston), 2012-2013.
Molly McCarthy^{**}, NSF REU (Trinity U) 2012.
Gustavo Chamusca^{*}, PURS scholar (University of Houston), 2011-2012.
Chris Brannan, NSF REU (UMass) 2011.
Anushimita Kulshik^{**}, UH-India summer program (IIT), 2010.
Melissa Young^{**}, STAR Program (University of Houston), 2009.