

Professional Affiliations

- N95DECON (n95deconorg) – *Member* (2020, 2021)
- American Society of Mechanical Engineers (ASME) – *Member*
- American Electrophoresis Society (AES) – *Member*
 - *Councilor* (Elected term for 2015-2017, 2018-2020)
- ElectroOptics Research Institute and Nanotechnology Center (Univ. of Louisville)
- Pi Tau Sigma, Mechanical Engineering Honor Society
- Tau Beta Phi Engineering Honor Society
- Kappa Sigma Fraternity – *Assistant Alumni Advisor, Purdue University*

Workshops Attended

- NASA Workshop: Colloids science to define the next generation of research in space (virtual), Aug. 9, 2022.
- Midwestern University Fluid Mechanics Retreat (MUFMECH), Rochester, Indiana, held annually in April (participant 2012-present).
 - Maintains workshop webpage: www.mufmech.org
- 2014 Celebration of Teaching and Learning “Igniting the Spark: Motivating Student Learning”, Feb. 7, 2014.
- National Science Foundation Workshop: “Science: Becoming the Messenger”, Louisville, KY, March 5, 2013.
- Workshop for Developing and Sustaining Productive Graduate Research Groups in Engineering, National Science Foundation, Arlington, VA, July 11-12, 2011.
- DARPA N/MEMS S&T Fundamentals All-Center Review, Bloomington, MN, June 24-26, 2008.
- 1st Annual Methods in Bioengineering Conference; Short Course: An introduction to microtechnology and microfluidics for biology and medicine, Boston, MA, July 17-19, 2006.

Awards and Recognition: Research

- Mid-Career Excellence Scholar / Ascending Star Fellow, Cohort 2022-2023, University of Louisville (April 2022)
- Honoree, 2022 UofL Research and Scholarship Awards (March 29, 2022)
- Research featured on the *front cover* of several peer reviewed journals: (7) *Physics Today*, Feb. 2021, (6) *ACS Nano*, May 2020, (5) *Electrophoresis*, June 2017, (4) *Biotechnology and Bioengineering*, June 2016, (3) *Electrophoresis*, July 2015, (2) *Electrophoresis*, July 2013, and (1) *Lab on a Chip*, July 2011.
- K Gupta received Honorable Mention for Best Student Paper submitted to *Electrophoresis*, December 2021 ([10.1002/elps.202100104](https://doi.org/10.1002/elps.202100104))
- MM Rahman received the 2019 ASGSR International Space Station U.S. National Lab Poster Award in Physical Sciences
- Selected to represent UofL at the ACCelerate: ACC Smithsonian Creativity and Innovation Festival, National Museum of American History, Washington, D.C., April 5-7, 2019. The museum had approximately 61,369 visitors during the festival.
- CASIS 2017 Student Investigator Space Flight Award, DJ Allen and SJ Williams, “Acoustic microfluidic mixing within a sealed channel,” ASGSR 2017, Seattle, WA.
- First Place, NSF REU poster competition, RP Accolla, DJ Allen, and SJ Williams, “Application of microfluidic techniques for an isomotive dielectrophoresis (isoDEP) platform,” *ASME/IMECE*, Track 19-2, IMECE2016-68895 (2016).

- Runner-up, Biomicrofluidics/AES Art in Science, A Mishra, KN Clayton, TR Maltais, TM Walter, T Kinzer-Ursem, A Wei, SJ Williams, and ST Wereley, “A bacteria flower,” AIChE 2016.

Awards and Recognition: Teaching, Public Outreach, Service

- Faculty Favorite: (2019-2020, 2016-2017, 2013-2014, 2011-2012)
- The “Maker’s Mark” whiskey web image was selected for the *art+science* exhibit at A *Smith Gallery* in Johnson City, TX (March 15 – May 19, 2019). It received “Visitor’s Award”, visitors voted this image as their favorite in the exhibit

Media Recognition

- Media associated with “whiskey web science”:
 - Featured on Bourbon Pursuit’s podcast, “317: The science of whiskey webs with Stuart Williams from the University of Louisville,” released August 5, 2021.
 - **“Whiskey Webs” on the front page of the *Courier Journal* (Louisville, KY) June 25, 2019.**
 - Research was included in *Edible Louisville & the Bluegrass* magazine. “Edible Ending: Whiskey Webs”, April 30, 2019.
 - Image was TV segment created by Mark Hebert for “UofL Today with Mark Hebert” that will air on local newscasts (WHAS, WLKY). Aired week of April 18, 2019. YouTube of segment available: <https://youtu.be/-oVG0M4N39s>
 - The “Maker’s Mark” image was featured on Wired’s Instagram feed (@wired) and received over 5000 ‘likes’ (April 2019).
 - Presentation at Louisville Underground Science’s “Beer with a Scientist”, Holsopple Brewing, December 5, 2018.
 - UofL News article, “Can evaporated drops of bourbon be used to identify counterfeits? Lean about whiskey webs at Beer with a Scientist, Dec. 5” by Betty Coffman, Nov. 26, 2018.
 - Received the 2018 Milton Van Dyke Poster Award at APS DFD (Atlanta, GA, Nov. 2018).
 - Displayed at the Bourbon and Distilled Spirits Career Fair on October 11, 2018 at The Woodford Reserve Room at Kroger Field, Lexington, KY.
 - Presented at Kentucky Science Center’s “Eat, Drink, and Do Science” on September 14, 2018.
- “UofL Today with Mark Hebert” radio broadcast on 93.9 FM, aired 2/6/2018.
- “Speed professor serving as science lead on NASA Kentucky program,” UofL News, Alicia Kelso, July 28, 2017.
 - Additionally featured articles include: UKnow (uknow.uky.edu, by Kel Hahn, 07/27/17).
- “UofL researchers team up with NASA to study fundamentals of physics,” Insider Louisville, Boris Ladwig, May 20, 2016.
- “UofL Today with Mark Hebert” radio broadcast on 93.9 FM, aired 11/23/2015.
- UofL Today, “UofL research is out of this world,” August 10, 2015 (Video).
- UofL Today, “UofL project to take place on the International Space Station,” July 29, 2014.
 - Additionally featured articles include: The Tiger Magazine (Winter 2015), USA Today (07/30/14), 84WHAS (07/29/14), WFPL (07/30/14), WKYT (07/29/14), Louisville Business First (07/28/14), The Lane Report (07/28/14), Kentucky.com (07/29/14)
- Purdue University Press Release, “Laser, electric fields combined for new ‘lab-on-chip’ technologies,” written by Emil Venere. July 5, 2011.
 - Featured in Purdue Engineering Impact Magazine, Fall 2011

Awards and Recognition as a Graduate Student

- Excellent Paper Award, ASME 2009 Micro/Nanoscale Heat and Mass Transfer International Conference (MNHMT2009), SJ Williams, A Kumar, and ST Wereley, "Micro and nano particle manipulation using optically modulated electrokinetic flows," Shanghai, China, Dec. 18-21, 2009.
- 3rd Place, Best Poster Competition, ASME Society-Wide Micro/Nano Technology Forum (2009), JS Kwon, A Kumar, SJ Williams, and ST Wereley, "Rapid electrokinetic patterning of colloidal particles with optical landscapes," Lake Buena Vista, FL, Nov. 13-19, 2009.
- 2nd Place, Gold Division, Burton D. Morgan Business Plan Competition. SJ Williams, H-S Chuang, and A Kumar. Liquid Qinetics. Purdue University, West Lafayette, Indiana, Feb. 24, 2009.
- 1st Place Poster, Engineering Sciences, SJ Williams, A Kumar, and ST Wereley, "Rapid electrokinetic patterning of colloids using optical landscapes," 2009 Graduate Student Poster Competition sponsored by Sigma Xi, Purdue University, West Lafayette, Indiana, Feb. 2009.
- Purdue University Press Release, "New holographic method could be used for lab-on-a-chip technologies," written by Emil Venere. Dec. 2, 2008.
- Outstanding Video, Gallery of Fluid Motion at Amer. Phys. Soc./Div. Fluid Dyn. Annual Meeting, SJ Williams, A Kumar, and ST Wereley, "Optically induced electrokinetic patterning and manipulation of particles," San Antonio, TX, Nov. 2008.
 - Most downloaded video from eCommons@Cornell for the month of December, 2008. (hdl.handle.net/1813/11399)
- Young Researcher Poster Award Winner at Proc. 12th International Conference on Miniaturized Systems for Chemistry and Life Sciences (μ TAS 2008), "Rapid electrokinetic patterning of colloids using optical landscapes," San Diego, USA, Oct. 12-16, 2008.
- Best Poster Award at the 2nd Annual Birck Nanotechnology Research Review, SJ Williams, A Kumar, and ST Wereley, "Rapid electrokinetic patterning of colloidal particles with optical landscapes," April 14, 2008.
- Kappa Sigma Fraternity, Chi Chapter 2007 Man of the Year, Purdue University, Spring 2007.
- Acknowledged in "Microfabricated thermal conductivity detector for the micro-ChemLabTM," *Sensors and Actuators B*, Vol. 121, 414-422 (2007). [10.1016/j.snb.2006.04.107](https://doi.org/10.1016/j.snb.2006.04.107)
- National Science Foundation Graduate Research Fellowship, Spring 2006.
- Laura Winkelman Fellowship for Doctoral Studies in the School of Mechanical Engineering, Purdue University, Summer 2005.
- Lewis S. Streng Scholarship Award for High Honors, JB Speed School of Engineering, University of Louisville, Spring 2005.
- Graduate Student Academic Achievement Award, Mechanical Engineering, University of Louisville, Spring 2005.

Awards as an Undergraduate Student

- Alumni Departmental Award, Mechanical Engineering, University of Louisville, Spring 2004.
- Highest cumulative GPA of Fraternities and Sororities, University of Louisville, Spring 2004.
- R&D 100 Award, SnifferStarTM Chemical Sensor; Team Member, Sandia National Laboratories, 2003.
- Junior Academic Achievement Award for Mechanical Engineering, University of Louisville, Spring 2003.
- Sophomore Academic Achievement Award for Mechanical Engineering, University of Louisville, Spring 2002.
- Dean's Scholar, University of Louisville, Fall 2000 – Summer 2005.

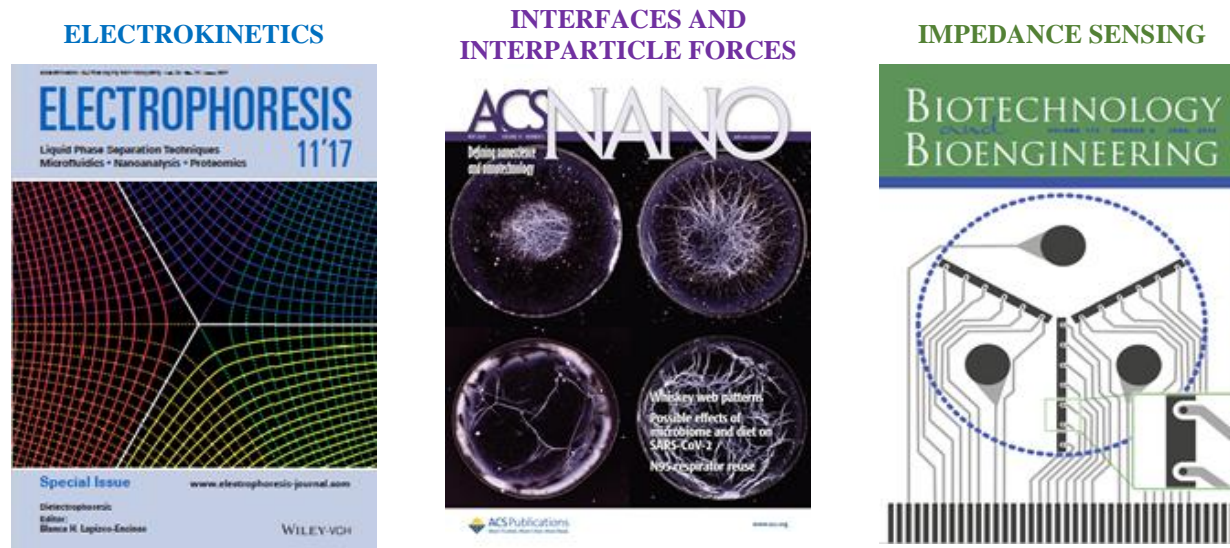
- President's Scholarship, University of Louisville, Fall 2000 – Summer 2005.

SCHOLARSHIP OF DISCOVERY, INTEGRATION AND APPLICATION

Research Specialties

My research expertise can generally be described as multidisciplinary applications of microfluidics, colloids, and multiscale systems. Topics include experimental fluid mechanics, flow visualization, electrospinning, MEMS and bio-MEMS, optical and opto-electronic devices, AC electrokinetic methods including dielectrophoresis, electrothermal hydrodynamics and AC electro-osmotic flow, electrical and optical manipulation of particles and fluids, development of microfluidic diagnostic techniques.

Most studies can be placed into one of three categories:



Representative work (link to refereed publication # below):

- | | | |
|--------------------------------------|--------------------------------------|--------------------------------|
| Isomotive dielectrophoresis (24) | Monolayer collapse & patterning (31) | COVID19 antibodies (34) |
| Rapid electrokinetic patterning (19) | Interparticle hydrodynamics (41) | Endothelial cells (21) |
| Nanoparticle trapping (14) | Microgravity experiments (43) | Phytoplankton suspensions (37) |

Book Chapters

5. A Survant and **SJ Williams**, "Electrokinetic sorting of colloids," Encyclopedia of Surface and Colloid Science, Ed. Ponisseril Somasundaran, Taylor and Francis (2014).
4. H-S Chuang, A Kumar, **SJ Williams**, and ST Wereley, "Optoelectrically-enabled multiscale manipulation," Encyclopedia of Nanotechnology, Ed. Bharat Bhushan, Springer (2012).
3. A Kumar, **SJ Williams**, NG Green, and ST Wereley, "Opto-electronic manipulation of particles," Microfluidics and Nanofluidics Handbook, Eds. Sushanta K. Mitra and Suman Chakraborty, Springer (2011).
2. **SJ Williams**, "AC dielectrophoresis lab-on-chip devices," Encyclopedia of Microfluidics and Nanofluidics, Ed. Dongqing Li, Springer, New York (2008).
1. **SJ Williams**, "Dielectrophoretic motion of particles and cells," Encyclopedia of Microfluidics and Nanofluidics, Ed. Dongqing Li, Springer, New York (2008).

Under Preparation or Submitted

- TK Mondal and **SJ Williams**, "Microfluidics and the spirits industry: A review," (under revision).

Refereed Publications

(* denote University of Louisville students: 43 authorships on 25 manuscripts)

45. V Velasco*, P Soucy, R Keynton, and **SJ Williams**, “Characterization of an in vitro impedance microfluidic platform with independently addressable electrodes,” *Lab on a Chip* (accepted).
44. **SJ Williams**, S Islam, and OD Velev, “Light scattering of colloidal suspensions: formation and stability in bourbon whiskeys,” *Journal of the Institute of Brewing*, 128, 66-72 (2022). [10.1002/jib.689](https://doi.org/10.1002/jib.689)
43. A Cecil*, JE Payne*, LT Hawtrey*, BC King*, GA Willing, and **SJ Williams**, “Nonlinear agglomeration of bimodal colloids under microgravity,” *Gravitational and Space Research* (2022). [10.2478/gsr-2022-0001](https://doi.org/10.2478/gsr-2022-0001)
42. **SJ Williams**, J D Schneider*, BC King*, NG Green, “Particle-induced electrostatic repulsion within an electric curtain operating below the Paschen limit,” *Micromachines*, 13, 288 (2022). [10.3390/mi13020288](https://doi.org/10.3390/mi13020288)
41. MM Rahman* and **SJ Williams**, “Cyclic force driven colloidal self-assembly near a solid surface,” *Journal of Colloid and Interface Science*, 607, 1402-1410 (2022). [10.1016/j.jcis.2021.09.063](https://doi.org/10.1016/j.jcis.2021.09.063)
40. LH Tompkins*, SR Prina, BN Gellman, GF Morello, T Roussel, JA Kopechek, **SJ Williams**, PC Petit, MS Slaughter, SC Koenig, and KA Dasse, “Development of inspired therapeutics pediatric VAD: Computational analysis and characterization of VAD V3,” *Cardiovascular Engineering and Technology* (2022). [10.1007/s13239-021-00602-2](https://doi.org/10.1007/s13239-021-00602-2)
39. K Gupta, Z Chen, **SJ Williams**, and ST Wereley, “Time-resolved particle image velocimetry analysis and computational modeling of transient optically induced electrothermal micro vortex,” *Electrophoresis*, 42, 2483-2489 (2021). [10.1002/elps.202100104](https://doi.org/10.1002/elps.202100104)
 - Honorable mention, *Best Student Paper*, December 2021
38. **SJ Williams**, “Whiskey webs: Fingerprints of evaporated bourbon,” *Physics Today*, 74 (2), 62 (2021). [10.1063/PT.3.4686](https://doi.org/10.1063/PT.3.4686)
 - Featured on cover, February 2021
37. MR Jett*, MZ Rashed*, SP Hendricks, and **SJ Williams**, “Electrical characterization of phytoplankton suspensions using impedance spectroscopy,” *Journal of Applied Phycology*, 33, 1643-1650 (2021). [10.1007/s10811-020-02363-2](https://doi.org/10.1007/s10811-020-02363-2)
36. L Anderegg, JM Doyle, ML Gardel, A Gupta, C Hallas, Y Lensky, NG Love, BA Lucas, E Mazenc, C Meisenhelder, A Pillarisetti, D Ranard, AH Squires, J Vechakul, NB Vilas, **SJ Williams**, D Wilson, TN Chen, and N95 DECON consortium, “Heat and humidity for bioburden reduction of N95 filtering facepiece respirators,” *Applied Biosafety*, Jun 2021, 80-89 (2021). [10.1089/apb.20.0053](https://doi.org/10.1089/apb.20.0053)
35. MM Rahman* and **SJ Williams**, “Membrane tension may define the deadliest virus infection,” *Colloid and Interface Science Communications*, 40, 100338 (2021). [10.1016/j.colcom.2020.100338](https://doi.org/10.1016/j.colcom.2020.100338)
34. MZ Rashed*, JA Kopecheck, MC Priddy*, KT Hamorsky, KE Palmer, N Mittal, J Valdez, and **SJ Williams**, “Rapid detection of SARS-CoV-2 antibodies using electrochemical impedance-based detector,” *Biosensors and Bioelectronics*, 171, 112709 (2021). [10.1016/j.bios.2020.112709](https://doi.org/10.1016/j.bios.2020.112709)
33. **SJ Williams**, “Assessment of a food-warming cabinet for heat and humidity decontamination of N95 respirators,” *Journal of Heat Transfer*, 143(1), 014502 (2021). [10.1115/1.4048739](https://doi.org/10.1115/1.4048739)
32. MZ Rashed* and **SJ Williams**, “Advances and applications of isomotive dielectrophoresis for cell analysis,” *Analytical and Bioanalytical Chemistry*, 412, 3813-3833 (2020). [10.1007/s00216-020-02590-z](https://doi.org/10.1007/s00216-020-02590-z)

31. AD Carrithers*, MJ Brown VI*, MZ Rashed, S Islam, OD Velev, and **SJ Williams**, "Multiscale self-assembly of distinctive weblike structures from evaporated drops of dilute American whiskeys," *ACS Nano*, 14 (5), 5417-5425 (2020). [10.1021/acsnano.9b08984](https://doi.org/10.1021/acsnano.9b08984)
 - Editor's Choice for March 25, 2020 (free to download)
 - Top 5% of all research output scores by Altmetric
 - Chosen for cover article, May 2020 issue
30. MZ Rashed*, NG Green, and **SJ Williams**, "Scaling law analysis of electrohydrodynamics and dielectrophoresis for isomotive dielectrophoresis microfluidic devices," *Electrophoresis*, 41 (1-2), 148-155 (2020). [10.1002/elps.201900311](https://doi.org/10.1002/elps.201900311)
29. MZ Rashed*, CJ Belott*, BR Janis*, MM Menze, and **SJ Williams**, "New insights into anhydrobiosis using cellular dielectrophoresis-based characterization," *Biomicrofluidics*, 13, 064113 (2019). [10.1063/1.5126810](https://doi.org/10.1063/1.5126810)
28. **SJ Williams**, MJ Brown VI*, and AD Carrithers*, "Whiskey webs: microscale 'fingerprints' of bourbon whiskey," *Physical Review Fluids*, 4, 100511 (2019). [10.1103/APS.DFD.2018.GFM.P0002](https://doi.org/10.1103/APS.DFD.2018.GFM.P0002)
27. M Moradi*, H Rathnayake, **SJ Williams**, GA Willing, "Effect of functionalization on the properties of silsesquioxane: a comparison to silica," *Colloid and Polymer Science*, 297 (5), 697-704 (2019). [10.1007/s00396-019-04489-3](https://doi.org/10.1007/s00396-019-04489-3)
26. MM Rahman*, W Lee*, A Iyer*, **SJ Williams**, "Viscous resistance in drop coalescence," *Physics of Fluids*, 31, 012104 (2019). [10.1063/1.5064706](https://doi.org/10.1063/1.5064706)
25. MZ Rashed*, V Velasco*, and **SJ Williams**, "Advances and applications of Rapid Electrokinetic Patterning," *Journal of the Indian Institute of Science*, 98 (2), 85-101 (2018). [10.1007/s41745-018-0076-2](https://doi.org/10.1007/s41745-018-0076-2)
24. DJ Allen*, RP Accolla, and **SJ Williams**, "Isomotive dielectrophoresis (isoDEP) for parallel analysis of individual particles," *Electrophoresis*, 38, 1441-1449 (2017). [10.1002/elps.201600517](https://doi.org/10.1002/elps.201600517)
 - Featured on the cover of *Electrophoresis*, June 2017, No. 11
23. A Mishra, TR Maltais, TM Walter, A Wei, **SJ Williams**, and ST Wereley, "Trapping and viability of swimming bacteria in an optoelectric trap," *Lab on a Chip*, 16, 1039-1046 (2016). [10.1039/C5LC01559F](https://doi.org/10.1039/C5LC01559F)
22. A Mishra, K Clayton, V Velasco*, **SJ Williams**, and ST Wereley, "Dynamic optoelectric trapping and deposition of multiwalled carbon nanotubes," *Microsystems & Nanoengineering*, 2, 16005 (2016). [10.1038/micronano.2016.5](https://doi.org/10.1038/micronano.2016.5)
21. V Velasco*, M Gruenthal*, E Zusstone, JMD Thomas*, RS Keynton, RE Berson, and **SJ Williams**, "An orbital shear platform for in vitro real-time endothelium characterization," *Biotechnology and Bioengineering* 113, 1336-1344 (2016). [10.1002/bit.25893](https://doi.org/10.1002/bit.25893)
 - Featured on the cover of *Biotechnology and Bioengineering*, June 2016, No. 6
20. A Mishra, J Khor, KN Clayton, **SJ Williams**, X Pan, T Kinzer-Ursem, and ST Wereley, "Optoelectric patterning: Effect of electrode material and thickness on laser-induced AC electrothermal flow," *Electrophoresis*, 37, 658-665 (2016). [10.1002/elps.201500473](https://doi.org/10.1002/elps.201500473)
19. AH Work, Jr.*, and **SJ Williams**, "Characterization of 2D colloid aggregations created by optically-induced electrohydrodynamics," *Electrophoresis*, 36, 1674-1680 (2015). [10.1002/elps.201500111](https://doi.org/10.1002/elps.201500111)
 - Featured on the cover of *Electrophoresis*, July 2015, No. 15
18. **SJ Williams** and NG Green, "Electrothermal pumping with interdigitated electrodes and resistive heaters," *Electrophoresis*, 36, 1681-1689 (2015). [10.1002/elps.201500112](https://doi.org/10.1002/elps.201500112)
17. AH Work, Jr.*, and **SJ Williams**, "Characterization of 2D colloids assembled by optically-induced electrohydrodynamics," *Soft Matter*, 11, 4266-4272 (2015). [10.1039/C5SM00184F](https://doi.org/10.1039/C5SM00184F)

16. **SJ Williams**, N Romero*, L Parkes*, DJ Jackson, and JF Naber, “Inexpensive three-dimensional dielectrophoretic microfluidic devices using milled copperclad substrates,” *Journal of Electrostatics*, 75, 49-53 (2015). [10.1016/j.elstat.2015.02.003](https://doi.org/10.1016/j.elstat.2015.02.003)
15. K-C Wang, A Kumar, **SJ Williams**, NG Green, KC Kim, and H-S Chuang, “An optoelectrokinetic technique for programmable particle manipulation and bead-based biosignal enhancement,” *Lab on a Chip*, 14, 3958-3967 (2014). [10.1039/C4LC00661E](https://doi.org/10.1039/C4LC00661E)
 - Featured on the back cover of *Lab on a Chip*, November 2014, No. 18
14. NR Wood*, AI Wolsiefer*, RW Cohn, and **SJ Williams**, “Dielectrophoretic trapping of nanoparticles with an electrokinetic nanoprobe,” *Electrophoresis*, 34, 1922-1931 (2013). [10.1002/elps.201300004](https://doi.org/10.1002/elps.201300004)
 - Featured on the front cover of *Electrophoresis*, July 2013, No. 13
13. **SJ Williams**, “Enhanced electrothermal pumping with thin film resistive heaters,” *Electrophoresis*, 34, 1400-1408 (2013). [10.1002/elps.201200377](https://doi.org/10.1002/elps.201200377)
12. V Velasco* and **SJ Williams**, “Electrokinetic concentration, patterning, and sorting of colloids with thin film heaters,” *J. Colloid and Interface Science*, 394, 598-603 (2013). [10.1016/j.jcis.2012.11.066](https://doi.org/10.1016/j.jcis.2012.11.066)
11. V Velasco*, AH Work, Jr.*, and **SJ Williams**, “Electrokinetic concentration and patterning of colloids with a scanning laser,” *Electrophoresis*, 33(13), 1931-1937 (2012). [10.1002/elps.201100676](https://doi.org/10.1002/elps.201100676)
10. A Kumar, **SJ Williams**, H-S Chuang, NG Green, and ST Wereley, “Hybrid opto-electric manipulation in microfluidics – opportunities and challenges,” *Lab on a Chip*, 11, 2135-2148 (2011). [10.1039/C1LC20208A](https://doi.org/10.1039/C1LC20208A)
 - Featured on the front cover of *Lab on a Chip*, July 2011
9. A Kumar, C Cierpka, **SJ Williams**, CJ Kahler, and ST Wereley, “3D3C velocimetry measurements of an electrothermal microvortex using wavefront deformation PTV and a single camera,” *Microfluidics and Nanofluidics*, 10, 355-365 (2011). [10.1007/s10404-010-0674-4](https://doi.org/10.1007/s10404-010-0674-4)
8. A Kumar, JS Kwon, **SJ Williams**, NG Green, N Yip, and ST Wereley, “Optically modulated electrokinetic manipulation and concentration of colloidal particles near an electrode surface,” *Langmuir*, 26, 5262-5272 (2010). [10.1021/la904661y](https://doi.org/10.1021/la904661y)
7. **SJ Williams**, C Park, and ST Wereley, “Advances and applications on microfluidic velocimetry techniques,” *Microfluidics and Nanofluidics*, 8, 709-726 (2010). [10.1007/s10404-010-0588-1](https://doi.org/10.1007/s10404-010-0588-1)
6. **SJ Williams**, P Chamarthy, and ST Wereley, “Comparison of experiments and simulation of Joule heating in AC electrokinetic chips,” *Journal of Fluids Engineering*, 132, 021103 (2010). [10.1115/1.4000740](https://doi.org/10.1115/1.4000740)
5. **SJ Williams**, A Kumar, NG Green, and ST Wereley, “Optically induced electrokinetic concentration and separation of colloids,” *Journal of Micromechanics and Microengineering*, 20, 015022 (2010). [10.1088/0960-1317/20/1/015022](https://doi.org/10.1088/0960-1317/20/1/015022)
 - Article chosen to appear in IOP Select (<http://www.iop.org/Select/>)
4. **SJ Williams**, A Kumar, NG Green, and ST Wereley, “A simple, optically induced electrokinetic method to concentrate and pattern nanoparticles,” *Nanoscale*, 1, 133-137 (2009). [10.1039/B9NR00033J](https://doi.org/10.1039/B9NR00033J)
3. **SJ Williams**, A Kumar, and ST Wereley, “Optically induced electrokinetic patterning and manipulation of particles,” *Physics of Fluids*, 26th Annual Gallery of Fluid Motion, Vol. 21, 091104, (2009). [10.1063/1.3200938](https://doi.org/10.1063/1.3200938)
2. A Kumar, **SJ Williams**, and ST Wereley, “Experiments on opto-electrically generated vortices,” *Microfluidics and Nanofluidics*, 6, 637-646 (2009). [10.1007/s10404-008-0339-8](https://doi.org/10.1007/s10404-008-0339-8)

1. **SJ Williams**, A Kumar, and ST Wereley, “Electrokinetic patterning of colloidal particles with optical landscapes,” *Lab on a Chip*, 8, 1879-1882 (2008). [10.1039/B810787D](https://doi.org/10.1039/B810787D)

Full-Length Peer-Reviewed Conference Papers

(* denote University of Louisville students: 13 authorships on 11 papers)

28. K Gupta, DH Lee, ST Wereley, and **SJ Williams**, “Characterization of interactive force acting on colloidal particles near an electrode in presence of a high-frequency (> 10 kHz) AC electric field using particle diffusometry,” *14th International Symposium on Particle Image Velocimetry*, Aug. 1-4, 2021 (Oral). [10.18409/ispiv.v1i1.56](https://doi.org/10.18409/ispiv.v1i1.56)
27. MZ Rashed*, J Kopecheck, M Priddy*, K Hamorsky, K Palmer, N Mittal, J Valdez, J Flynn, and **SJ Williams**, “Electrochemical impedance-based detector for SARS-CoV-2 antibodies” *Proc. 24th International Conference on Miniaturized Systems for Chemistry and Life Sciences (μTAS2020)*, Virtual, Oct. 4-9, 2020 (Poster). ISBN: 9781713821236
26. MZ Rashed*, CJ Belott*, MA Menze, and **SJ Williams**, “Dielectrophoresis based characterization of lea protein,” *Proc. 22nd International Conference on Miniaturized Systems for Chemistry and Life Sciences (μTAS2018)*, Kaohsiung, Taiwan, Nov. 11-15, 2018 (Poster). ISBN: 9781510897571
25. X Fan*, PS Soucy, MM Crain, **SJ Williams** and RS Keynton, “Fabrication and characterization of biopolymer fibers for 3D oriented microvascular structure,” *9th International Conference on Microtechnologies in Medicine and Biology (MMB)*, Monterey, CA, March 26-28, 2018 (Poster).
24. MZ Rashed*, KC Grome*, G Gasser, SP Hendricks, and **SJ Williams**, “Comprehensive single cell dielectric spectroscopy using isomotive dielectrophoresis (isoDEP),” *Proc. 21st International Conference on Miniaturized Systems for Chemistry and Life Sciences (μTAS2017)*, Savannah, GA WA, Oct. 22-26, 2017 (Poster). ISBN: 9781713802723
23. H Yuan*, MM Crain, PS Soucy, **SJ Williams**, and RS Keynton, “Characterization of a fluidic platform for nanoscale cellular electroporation,” *Proc. 21st International Conference on Miniaturized Systems for Chemistry and Life Sciences (μTAS2017)*, Savannah, GA WA, Oct. 22-26, 2017 (Poster). ISBN: 9781713802723
22. A Mishra, R Thakur, **SJ Williams**, A Kumar, and ST Wereley, “Optoelectrokinetic trapping of gold nanoparticles,” *2nd European Optical Society Conference on Optofluidics*, Paper #1569717107, Munich, Germany, May 13-15, 2013
21. J-S Kwon, V Velasco*, **SJ Williams**, and ST Wereley, “Rapid electrokinetic patterning technique for manipulation of colloids and microorganisms, and its technical advancement,” *2nd European Optical Society Conference on Optofluidics*, Paper #1569717213, Munich, Germany, May 13-15, 2013.
20. BR LaPrade*, B Panchapakesan, and **SJ Williams** “Opto-mechanical actuation of carbon nanotube/polymer composite membranes for microfluidic pumping applications,” *Proc. ASME/IMECE*, Paper #2012-86138, Houston, TX, Nov. 9-15, 2012. [10.1115/IMECE2012-86138](https://doi.org/10.1115/IMECE2012-86138)
19. AH Work, Jr.* , V Velasco*, and **SJ Williams** “Electrokinetic manipulation of colloids with a scanning laser,” *Proc. ASME/IMECE*, Paper #2012-87491, Houston, TX, Nov. 9-15, 2012. [10.1115/IMECE2012-87491](https://doi.org/10.1115/IMECE2012-87491)
18. J Sunding*, V Velasco* and **SJ Williams** “Electrothermal pumping with thin film resistive heaters,” *Proc. ASME/IMECE*, Paper #2011-64725, Denver, CO, Nov. 11-17, 2011. [10.1115/IMECE2011-64725](https://doi.org/10.1115/IMECE2011-64725)
17. **SJ Williams**, V Velasco*, J-S Kwon, SP Ravindranath, J Irudayaraj, and ST Wereley, “Rapid concentration and manipulation of colloids and microorganisms through double layer polarization

- electrokinetics,” *Proc. 15th International Conference on Miniaturized Systems for Chemistry and Life Sciences (μ TAS2011)*, Seattle, WA, Oct. 2-6, 2011 (Poster). ISBN: 978-0-9798064-4-5
16. **SJ Williams**, A Kumar, and ST Wereley, “Optically induced electrokinetic trapping and sorting of colloids,” *Proc. ASME/FEDSM-ICNMM*, Paper#2010-30465, Montreal, Canada, Aug. 1-5, 2010. [10.1115/FEDSM-ICNMM2010-30465](https://doi.org/10.1115/FEDSM-ICNMM2010-30465)
 15. J Duff*, **SJ Williams**, and B Panchapakesan, “Microfluidic pumping with optically induced actuation of a carbon nanotube membrane,” *Proc. ASME/FEDSM-ICNMM*, Paper#2010-30097, Montreal, Canada, Aug. 1-5, 2010. [10.1115/FEDSM-ICNMM2010-30097](https://doi.org/10.1115/FEDSM-ICNMM2010-30097)
 14. A Kumar, C Cierpka, **SJ Williams**, CJ Kahler, and ST Wereley, “3D3C velocimetry measurements of an electrothermal microvortex using wavefront deformation PTV and a single camera,” *15th International Symposium on Applications of Laser Techniques to Fluid Mechanics*, Lisbon, Portugal, July 5-8, 2010.
 13. **SJ Williams** and ST Wereley, “Experiments and simulation of a dielectrophoretically oscillating microparticle,” *15th International Symposium on Applications of Laser Techniques to Fluid Mechanics*, Lisbon, Portugal, July 5-8, 2010.
 12. JS Kwon, A Kumar, **SJ Williams**, and ST Wereley, “A study for electrokinetic mechanism of colloidal particle on an electrode surface using Voronoi and Delaunay tessellation,” *15th International Symposium on Applications of Laser Techniques to Fluid Mechanics*, Lisbon, Portugal, July 5-8, 2010.
 11. **SJ Williams**, A Kumar, and ST Wereley, “Micro and nano particle manipulation using optically modulated electrokinetic flows,” *ASME 2009 Micro/Nanoscale Heat and Mass Transfer International Conference*, MNHMT2009-18493, Shanghai, China, Dec. 18-21, 2009. [10.1115/MNHMT2009-18493](https://doi.org/10.1115/MNHMT2009-18493)
 10. A Kumar, **SJ Williams**, J-S Kwon, NG Green, NK Yip, and ST Wereley, “Optically induced rapid electrokinetic patterning: a study of the operational regimes and dominant forces,” *Proc. ASME/IMECE*, IMECE2009-11518, Lake Buena Vista, FL, Nov. 13-19, 2009. [10.1115/IMECE2009-11518](https://doi.org/10.1115/IMECE2009-11518)
 9. **SJ Williams**, A Kumar, and ST Wereley, “Optically induced electrohydrodynamics and electrokinetic colloidal aggregation,” *Proc. ASME/FEDSM*, Paper#2009-78121, Vail, CO, Aug. 2-6, 2009. [10.1115/FEDSM2009-78121](https://doi.org/10.1115/FEDSM2009-78121)
 8. **SJ Williams** and ST Wereley, “Hydrodynamic investigations of a dielectrophoretically trapped and agitated microparticle,” *Proc. ASME/FEDSM*, Paper#2009-78068, Vail, CO, Aug. 2-6, 2009. [10.1115/FEDSM2009-78068](https://doi.org/10.1115/FEDSM2009-78068)
 7. A Kumar, **SJ Williams**, and ST Wereley, “A novel optically driven electrokinetic technique for manipulating nanoparticles,” *Proc. SPIE*, 7400, 74000V (2009). [10.1117/12.826932](https://doi.org/10.1117/12.826932)
 6. A Kumar, JS Kwon, **SJ Williams**, and ST Wereley, “Optically modulated rapid electrokinetic patterning for micro and nano particles,” *Proc. SPIE*, 7371, 737110 (2009). [10.1364/ECBO.2009.7371_10](https://doi.org/10.1364/ECBO.2009.7371_10)
 5. ST Wereley, E Judokusumo, A Kumar, and **SJ Williams**, “Velocity fields in opto-electrically induced fluid flows,” *The Seventh International Conference on Nanochannels, Microchannels, and Minichannels (ICNMM)*, Keynote Presentation, ICNMM09-82153, Pohang, South Korea, June 22-24, 2009 (Oral). [10.1115/ICNMM2009-82153](https://doi.org/10.1115/ICNMM2009-82153)
 4. E Judokusumo, A Kumar, **SJ Williams**, and ST Wereley, “Analysis of optically induced fluid flows in electric fields,” *Proc. ASME/IMECE*, Paper #2008-66935, Boston, MA, Oct. 31 to Nov. 6, 2008. [10.1115/IMECE2008-66935](https://doi.org/10.1115/IMECE2008-66935)

3. A Kumar, **SJ Williams**, and ST Wereley, "Rapid electrokinetic patterning of colloids using optical landscapes," *Proc. 12th International Conference on Miniaturized Systems for Chemistry and Life Sciences (μ TAS2008)*, San Diego, CA, Oct. 12-16, 2008 (Poster). ISBN: 978-0-9798064-1-4
2. **SJ Williams**, P Chamarthy, and ST Wereley, "Laser-induced fluorescence thermometry for Joule heating in AC electrokinetic chips," *Proc. ASME/FEDSM*, Paper#2008-55175, Jacksonville, FL, Aug. 10-14, 2008. [10.1115/FEDSM2008-55175](https://doi.org/10.1115/FEDSM2008-55175)
1. **SJ Williams** and ST Wereley, "Field flow analysis of dielectrophoretically suspended particles," *Proc. ASME/IMECE*, Paper #2007-41252, Seattle, WA, Nov. 11-15, 2007. [10.1115/IMECE2007-41252](https://doi.org/10.1115/IMECE2007-41252)

Conference Abstracts, Conference Posters, and Invited Presentations

115. JD Murphy, B Mitchell, J Ketron, A Alhussainawi, and **SJ Williams**, "Development of a visual system for colloidal samples under microgravity conditions," *Annual Meeting of the American Society for Gravitational and Space Research*, Houston, TX, Nov. 9-12, 2022 (Poster).
114. TK Mondal, D Mattox, and **SJ Williams**, "Tuning of electrospinning parameters for nanofiber mats," *NNCI Nano + Additive Manufacturing Summit*, Louisville, KY, Aug. 9-10, 2022 (Poster).
113. K Luck and **SJ Williams**, "Study of monolayer collapse of droplets in virtual wells and on microfabricated pedestals," *NNCI Nano + Additive Manufacturing Summit*, Louisville, KY, Aug. 9-10, 2022 (Poster).
112. **SJ Williams** and MM Rahman, "Self-assembly of suspended particles through interparticle hydrodynamics," *NNCI Nano + Additive Manufacturing Summit*, Louisville, KY, Aug. 9-10, 2022 (Oral).
111. LH Tompkins, BN Gellman, GF Morello, SR Prina, T Roussel, JA Kopechek, **SJ Williams**, PC Petit, MS Slaughter, KA Dasse, SC Koenig, "Computational analysis and characterization of inspired therapeutics pediatric VAD V3," *ASAIO 66th Annual Conference*, Washington, DC, June 10-12, 2021.
110. MM Rahman and **SJ Williams**, "Simulating colloidal hydrodynamics near a solid surface with a modified approach: More physics, less mathematics," *73rd Annual Meeting of the APS Division of Fluid Dynamics*, Virtual, Nov. 22-24, 2020 (Oral).
109. K Gupta, Z Chen, **SJ Williams**, and ST Wereley, "Transient behavior of an optically induced electrothermal micro-vortex: modeling and PIV analysis," *73rd Annual Meeting of the APS Division of Fluid Dynamics*, Virtual, Nov. 22-24, 2020 (Oral).
108. MM Rahman, JE Payne, and **SJ Williams**, "Towards confinement-stabilized colloidal suspensions using a horizontally rotated microfluidic system," *35th Annual Meeting of the American Society for Gravitational and Space Research*, Denver, CO, Nov. 20-23, 2019 (Poster).
 - Received the 2019 ASGSR International Space Station U.S. National Lab Poster Award in Physical Sciences
107. GA Willing, **SJ Williams**, L Hawtry, JE Payne, and M Moradi, "Impacts of temperature on the stability of colloidal suspensions using the nanoparticle haloing mechanism," *35th Annual Meeting of the American Society for Gravitational and Space Research*, Denver, CO, Nov. 20-23, 2019 (Oral).
106. M Moradi, V Jaeger, GA Willing, and **SJ Williams**, "Mechanisms of nanoparticle haloing for the control of colloidal stability," *2019 AIChE Annual Meeting*, Orlando, FL, Nov. 10-15, 2019 (Oral).
105. S Islam, OD Velev, and **SJ Williams**, "Nanoscience of bourbon: Self-assembled micro-webs of colloids from whiskey droplet evaporation as unique identifiers of bourbon whiskeys," *ACS Fall 2019 National Meeting & Expo*, San Diego, CA, August 25-29, 2019 (Oral).

104. MM Rahman and **SJ Williams**, “How coalescence manipulation of landed drops can be useful in inkjet printing,” *Kentucky Nano + AM Symposium*, Louisville, KY, July 31 - Aug. 1, 2019 (Poster).
103. D Foushee and **SJ Williams**, “Effects of mash bill and age on whiskey webs,” *Kentucky Nano + AM Symposium*, Louisville, KY, July 31 - Aug. 1, 2019 (Poster).
102. **SJ Williams**, S Islam, and O Velev, “There are particles in my whiskey: dynamic light scattering characterization of bourbon whiskey colloids,” *2019 Colloid & Surface Science Symposium*, Atlanta, GA, June 16-19, 2019. (Oral)
101. MZ Rashed, CJ Belott, MA Menze, and **SJ Williams**, “Dielectrophoresis based characterization of LEA proteins,” *2019 Colloid & Surface Science Symposium*, Atlanta, GA, June 16-19, 2019. (Oral)
100. M Brown VI, AD Carrithers, and **SJ Williams**, “Self-assembly of microstructures from evaporation of volatile diluted American whiskey,” *2019 Colloid & Surface Science Symposium*, Atlanta, GA, June 16-19, 2019. (Poster)
99. M Jett, K Henson, MZ Rashed, S Hendricks, and **SJ Williams**, “Impedance spectroscopy based evaluation of phytoplankton health,” *2019 Colloid & Surface Science Symposium*, Atlanta, GA, June 16-19, 2019. (Poster)
98. MM Rahman, JE Payne, RE Wakefield, and **SJ Williams**, “Colloid structure formation through hydrodynamic interactions near a wall in a vertically rotated confined cell,” *2019 Colloid & Surface Science Symposium*, Atlanta, GA, June 16-19, 2019. (Poster)
97. MZ Rashed, CJ Belott, MA Menze, and **SJ Williams**, “Dielectrophoresis based characterization of LEA proteins,” 13th International Symposium on Electrokinetics (ELKIN), Boston, MA, June 12-14, 2019. (Oral)
96. MZ Rashed, CJ Belott, MA Menze, and **SJ Williams**, “Electrohydrodynamic scaling laws analysis in a microfluidic isoDEP device,” 13th International Symposium on Electrokinetics (ELKIN), Boston, MA, June 12-14, 2019. (Poster)
95. MR Jett, KM Henson, MZ Rashed, SP Hendricks, and **SJ Williams**, “Impedance spectroscopy based evaluation of phytoplankton health,” *Kentucky Water Resources Annual Symposium*, Lexington, KY, March 23, 2019 (Poster).
94. S Islam, OD Velev, and **SJ Williams**, “The nanoscience of bourbon: Self-assembled micro-webs of colloids from whiskey droplet evaporation as unique identifiers of bourbon whiskeys,” Schoenborn Graduate Research Symposium 2019, Raleigh, NC, Jan. 28, 2019.
 - Second best poster
93. **SJ Williams**, MJ Brown VI, and AD Carrithers, “Whiskey webs: microscale ‘fingerprints’ of bourbon whiskey,” *71st Annual Meeting of the APS Division of Fluid Dynamics*, Atlanta, GA, Nov. 18-20, 2018 (Poster).
 - Received the 2018 Milton Van Dyke Poster Award
92. MM Rahman, WCB Lee, AB Iyer, and **SJ Williams**, “Hydrodynamics of drop coalescence,” *71st Annual Meeting of the APS Division of Fluid Dynamics*, Atlanta, GA, Nov. 18-20, 2018 (Poster).
91. MM Rahman, JE Payne, and **SJ Williams**, “Minimizing particle induced fluid motion in a vertically rotating system,” *71st Annual Meeting of the APS Division of Fluid Dynamics*, Atlanta, GA, Nov. 18-20, 2018 (Oral).
90. AD Carrithers, MJ Brown VI, and **SJ Williams**, “Analysis of self-assembled microstructures from evaporated drops of bourbon whiskey,” *71st Annual Meeting of the APS Division of Fluid Dynamics*, Atlanta, GA, Nov. 18-20, 2018 (Oral).

89. M Moradi, V Jaeger, **SJ Williams**, and GA Willing, "Molecular dynamics simulations of binary colloidal mixtures of silica and zirconia particles," *34th Annual Meeting of the American Society for Gravitational and Space Research*, Washington, DC, Oct. 31-Nov. 3, 2018 (Oral).
88. MM Rahman, JE Payne, and **SJ Williams**, "Long term colloid suspension in a vertically rotating system," *34th Annual Meeting of the American Society for Gravitational and Space Research*, Washington, DC, Oct. 31-Nov. 3, 2018 (Poster).
87. **SJ Williams**, "Characterization of self-assembled nanostructures from evaporated drops of bourbon whiskey," *Kentucky Nano + AM Symposium*, Louisville, KY, Aug. 1-2, 2018 (Oral).
86. MZ Rashed, CJ Belott, MA Menze, and **SJ Williams**, "Dielectrophoresis based characterization of LEA protein," *Dielectrophoresis 2018*, Surrey, UK, July 23-25, 2018 (Oral).
85. MZ Rashed, SP Hendricks, and **SJ Williams**, "Dielectrophoresis based characterization of phytoplankton cells," *Dielectrophoresis 2018*, Surrey, UK, July 23-25, 2018 (Poster).
84. **SJ Williams**, S Islam, O Velev, "Whiskey webs: self-assembled micro-webs from evaporated drops as unique identifiers of bourbon whiskey," *2018 Colloid & Surface Science Symposium*, State College, PA, June 10-13, 2018.
83. MZ Rashed, KC Grome, SP Hendricks, and **SJ Williams**, "Isomotive dielectrophoresis based characterization of chlamydomonas cells," *Kentucky Water Resources Annual Symposium*, Lexington, KY, March 19, 2018 (Poster).
82. MZ Rashed, KC Grome, SP Hendricks, and **SJ Williams**, "Isomotive dielectrophoresis based characterization of chlamydomonas cells," *Graduate Student Regional Research Conference*, University of Louisville, Louisville, KY, March 2-3, 2018 (Oral).
81. M Moradi, **SJ Williams**, GA Willing, "Stabilization of silsesquioxane microparticles with highly charged nanoparticles," *Graduate Student Regional Research Conference*, University of Louisville, Louisville, KY, March 2-3, 2018 (Oral).
80. **SJ Williams**, "Isomotive dielectrophoresis: design considerations and scaling laws," *2017 AIChE Annual Meeting, Annual Meeting of the American Electrophoresis Society*, Minneapolis, MN, Oct. 29-Nov. 3, 2017 (Oral, Invited).
79. MZ Rashed, KC Grome, SP Hendricks, and **SJ Williams**, "Isomotive dielectrophoresis based characterization of chlamydomonas cells," *2017 AIChE Annual Meeting, Annual Meeting of the American Electrophoresis Society*, Minneapolis, MN, Oct. 29-Nov. 3, 2017 (Oral).
78. MZ Rashed, KC Grome, SP Hendricks, and **SJ Williams**, "Electrohydrodynamic scaling laws analysis in a microfluidic isoDEP device," *2017 AIChE Annual Meeting, Annual Meeting of the American Electrophoresis Society*, Minneapolis, MN, Oct. 29-Nov. 3, 2017 (Poster).
77. M Moradi, **SJ Williams**, GA Willing, "Stabilization of colloidal suspensions with a bimodal distribution of microparticles and nanoparticles," *2017 AIChE Annual Meeting*, Minneapolis, MN, Oct. 29-Nov. 3, 2017 (Oral).
76. DJ Allen and **SJ Williams**, "Acoustic microfluidic mixing for remote sample preparation," *33rd Annual Meeting of the American Society for Gravitational and Space Research*, Seattle, WA, Oct. 25-28, 2017 (Poster).
 - CASIS 2017 Student Investigator Space Flight Award
75. GA Willing, **SJ Williams**, M Moradi, B King, and J Lee, "Depletion in complex fluids with a bimodal particle size distribution under microgravity," *33rd Annual Meeting of the American Society for Gravitational and Space Research*, Seattle, WA, Oct. 25-28, 2017 (Oral).
74. H Yuan, M Crain, P Soucy, **S Williams**, and R Keynton, "Characterization of a nanoscale electroporation platform using HL-60 Cells", *2017 BMES Annual Meeting*, Phoenix, AZ, Oct. 11-14, 2017 (Poster).

73. V Velasco, PA Soucy, R Keynton, and **SJ Williams**, “*In vitro* electrical impedance characterization of HUVECs undergoing hydrodynamic shear stress”, *2016 AIChE Annual Meeting, Annual Meeting of the American Electrophoresis Society*, San Francisco, CA, Nov. 13-18, 2016 (Oral).
72. V Velasco, PA Soucy, R Keynton, and **SJ Williams**, “Electrode topography effects on sheared HUVEC morphology within an electrical impedance system”, *2016 AIChE Annual Meeting, Annual Meeting of the American Electrophoresis Society*, San Francisco, CA, Nov. 13-18, 2016 (Poster).
 - Honorable Mention, AES Poster Session
71. V Velasco, DJ Allen, and **SJ Williams**, “Isomotive dielectrophoresis (isoDEP): Characterization through particle velocimetry”, *2016 AIChE Annual Meeting, Annual Meeting of the American Electrophoresis Society*, San Francisco, CA, Nov. 13-18, 2016 (Oral).
70. V Velasco, M Gruenthal, E Zusstone, JMD Thomas, RE Berson, R Keynton, and **SJ Williams**, “Introduction of two electrical impedance systems for the *in-vitro* characterization of HUVECs undergoing hydrodynamic shear stress”, *2016 AIChE Annual Meeting*, San Francisco, CA, Nov. 13-18, 2016 (Oral).
69. B King, RW Cohn, B Panchapakesan, and **SJ Williams**, “Nucleation and growth of spontaneously aligned regions in carbon nanotube thin films: a morphological analysis”, *2016 AIChE Annual Meeting*, San Francisco, CA, Nov. 13-18, 2016 (Oral).
68. B King, JD Schneider, M Larkin, J Tangney, and **SJ Williams**, “Colloidal dielectric forces within an electric curtain”, *2016 AIChE Annual Meeting, Annual Meeting of the American Electrophoresis Society*, San Francisco, CA, Nov. 13-18, 2016 (Oral).
67. MM Rahman, B King, NN Sreeramulu, J Ferguson, H Rathnayake, GA Willing, and **SJ Williams**, “An extended nanoparticle haloing study in microgravity”, *2016 AIChE Annual Meeting*, San Francisco, CA, Nov. 13-18, 2016 (Oral).
66. A Mishra, K Clayton, **SJ Williams**, TL Kinzer-Ursem, ST Wereley, and A Kumar, “Optoelectric trapping: effect of electrode material and thickness on light-induced electrothermal flow”, *2016 AIChE Annual Meeting, Annual Meeting of the American Electrophoresis Society*, San Francisco, CA, Nov. 13-18, 2016 (Oral).
65. RP Accolla, DJ Allen, and **SJ Williams**, “Application of microfluidic techniques for an isomotive dielectrophoresis (isoDEP) platform”, *ASME/IMECE, IMECE2016-68895*, Phoenix, AZ, Nov. 11-17, 2016 (Poster).
 - Awarded first place, NSF REU Poster Competition, Track 19-2
64. GA Willing, **SJ Williams**, JJ Lee, B King, M Moradi, and DR Ryan, “Impact of microgravity on particle aggregation in complex fluids with a bimodal particle size distribution”, *ASGSR 2016*, Cleveland, OH, October 26-29, 2016 (Oral).
63. MM Rahman and **SJ Williams**, “Microfluidic motion of suspended colloids within a vertically rotated reference frame”, *ASGSR 2016*, Cleveland, OH, October 26-29, 2016 (Poster).
62. M Moradi, JJ Lee, **SJ Williams**, and GA Willing, “Interparticle interaction forces and the stability of colloidal suspensions in the presence of charged nanoparticles”, *ASGSR 2016*, Cleveland, OH, October 26-29, 2016 (Poster).
61. JJ Lee, M Moradi, Md M Rahman, B King, **SJ Williams**, and GA Willing, “The influence of gravity on stable crystalline colloidal self-assembly using the nanoparticle haloing method”, *ASGSR 2016*, Cleveland, OH, October 26-29, 2016 (Poster).
60. B King, Md M Rahman, G Willing, H Rathnayake, JJ Lee, and **SJ Williams**, “Image analysis and data visualization for long term studies aboard the ISS with the Light Microscopy Module”, *ASGSR 2016*, Cleveland, OH, October 26-29, 2016 (Poster).

59. GA Willing, **SJ Williams**, H Rathnayake, D Ryan, B King, M Moradi, and JJ Lee “Influence of microgravity on aggregation in complex fluids with a bimodal particle size distribution: analysis of experiments performed on the International Space Station”, *Probing Dynamic Processes in Soft Materials Using Advanced Light Sources: a MaRIE Workshop*, Santa Fe, NM, July 25-27, 2016 (Poster).
58. DJ Allen and **SJ Williams**, “Isomotive dielectrophoresis for particle subpopulation analysis”, *Dielectrophoresis 2016*, Boston, MA, July 13-15, 2016 (Oral).
57. B King, JD Schneider, M Larkin, J Tangney, and **SJ Williams**, “Frequency-dependent dielectric force studies within a travelling wave electric curtain”, *Dielectrophoresis 2016*, Boston, MA, July 13-15, 2016 (Poster).
56. DJ Allen and **SJ Williams**, “Measuring Dielectric Properties from Individual Particles using Isomotive Dielectrophoresis (isoDEP)”, *Microfluidics Congress: USA*, Philadelphia, PA, July 11-12, 2016 (Poster).
55. NN Sreeramulu, H Rathnayake, **SJ Williams** and Gerold Willing, “Colloidal Self-assembly of multi-fluorescent silsesquioxane particles”, *American Chemical Society, Spring 2016 National Meeting*, San Diego, CA, March 2016 (Oral).
54. **SJ Williams**, GA Willing, and H Rathnayake, “Influence of gravity on nanoparticle haloing colloidal self-assembly,” *American Society for Gravitational and Space Research*, Washington, DC, November 11-14, 2015 (Oral).
53. **SJ Williams**, JD Schneider, and B King, “AC electrokinetic dust manipulation,” *American Society for Gravitational and Space Research*, Washington, DC, November 11-14, 2015 (Poster).
52. NN Sreeramulu, GA Willing, **SJ Williams**, and H Rathnayake, “Synthesis of multi-fluorescent silicon based colloids for colloidal self-assembly under microgravity,” *American Society for Gravitational and Space Research*, Washington, DC, November 11-14, 2015 (Poster).
51. V Velasco, RS Keynton, **SJ Williams**, “Microfluidic impedance chip for real-time *in vitro* analysis of endothelium under shear stress,” *Gordon Research Conference: Microfluidics, Physics & Chemistry of*, West Dover, VT, May 31-June 5, 2015 (Poster).
50. **SJ Williams**, V Hutchinson, J Jones, and J Duff, “Enhanced air filtration using dielectrophoresis,” *2015 Kentucky EPSCoR Annual Conference*, Lexington, KY, May 22, 2015 (Poster).
49. A Hack, D O’Brien, and **SJ Williams**, “Experimentation with colloidal particles for the ISS,” *2015 Kentucky EPSCoR Annual Conference*, Lexington, KY, May 22, 2015 (Poster).
48. H Rathnayake, T Abbewickrama, NN Sreeramulu, J Ferguson, **SJ Williams**, and G Willing “Synthesis of multi-fluorescent silicon based colloids for colloidal self-assembly under microgravity,” *2015 Kentucky EPSCoR Annual Conference*, Lexington, KY, May 22, 2015 (Poster).
47. A Mishra, **SJ Williams**, and ST Wereley, “Rapid electrokinetic patterning of metal nanoparticles and nanowires,” *67th Annual Meeting of the APS Division of Fluid Dynamics*, San Francisco, CA, Nov. 23-25, 2014 (Oral).
46. V Velasco and **SJ Williams**, “Microfluidic platform for impedance characterization of endothelial cells under fluid shear stress,” *2014 AIChE Annual Meeting, Annual Meeting of the American Electrophoresis Society*, Atlanta, GA, Nov. 16-21, 2014 (Oral).
45. V Velasco, M Gruenthal, **SJ Williams**, JMD Thomas, RE Berson, and R Keynton, “An orbital shear platform for in-vitro real-time endothelium characterization,” *2014 AIChE Annual Meeting, Annual Meeting of the American Electrophoresis Society*, Atlanta, GA, Nov. 16-21, 2014 (Poster).
44. A Mishra, **SJ Williams**, and ST Wereley, “Optoelectric trapping and manipulation of metal nanoparticles,” *2014 AIChE Annual Meeting, Annual Meeting of the American Electrophoresis Society*, Atlanta, GA, Nov. 16-21, 2014 (Oral).

43. K Clayton, A Mishra, **SJ Williams**, and ST Wereley, "Optoelectric assembly and manipulation of beads in a vertical tower configuration," *2014 AIChE Annual Meeting, Annual Meeting of the American Electrophoresis Society*, Atlanta, GA, Nov. 16-21, 2014 (Oral).
42. A Mishra, K Clayton, **SJ Williams**, and ST Wereley, "Rapid electrokinetic patterning: manipulating particles with laser and electric field," *2014 AIChE Annual Meeting, Annual Meeting of the American Electrophoresis Society*, Atlanta, GA, Nov. 16-21, 2014 (Poster).
 - Awarded first place, *AES Electrophoresis Society* poster session
41. **SJ Williams** and DG Allgeier, "Insulator-based micropipette dielectrophoretic trapping of particles," *2014 AIChE Annual Meeting, Annual Meeting of the American Electrophoresis Society*, Atlanta, GA, Nov. 16-21, 2014 (Oral).
40. GA Willing, Q He, H Rathnayake, and **SJ Williams**, "Stability of colloid suspensions with bimodal particle size distribution under thermophoretic flows," *30th Annual Meeting of the American Society for Gravitational and Space Research*, Pasadena, CA, Oct. 22-26, 2014 (Poster).
39. **SJ Williams**, A Mishra, V Velasco, and ST Wereley, "Electrothermal flow patterns generated by resistive heaters," *ASME FEDS/ICNMM, FEDSM2014-21623*, Chicago, IL, Aug. 3-7, 2014 (Oral).
38. **SJ Williams**, "Rapid electrokinetic patterning (REP): Current state of the art," *Dielectrophoresis 2014*, London, U.K., July 14-16, 2014 (Oral).
37. A Wolsiefer and **SJ Williams**, "Simultaneous opto-electrokinetic particle concentration and electrowetting," *9th International Meeting on Electrowetting and Related Micro/Electrofluidic Science and Technology*, Cincinnati, OH, June 23-25, 2014 (Poster).
36. SR Wills, K Heacox, RW Cohn, and **SJ Williams**, "Electrohydrodynamics of a point-and-plate nanoneedle," *ASME/IMECE, IMECE2013-64773*, San Diego, CA, Nov. 15-21, 2013 (Oral).
35. MJ Gruenthal, V Velasco, RE Berson, RS Keynton, and **SJ Williams**, "Impedance analysis of endothelial cells cultured on an orbital platform," *ASME/IMECE, IMECE2013-64789*, San Diego, CA, Nov. 15 – 21, 2013 (Oral).
34. N Romero, L Parkes, D Jackson, J Naber, and **SJ Williams**, "Inexpensive electrokinetic microfluidic systems using printed circuit board substrates," *2013 AIChE Annual Meeting, Annual Meeting of the American Electrophoresis Society*, San Francisco, CA, Nov. 3 – 8, 2013 (Oral).
33. **SJ Williams**, "Effects of microtopography on two-dimensional electrokinetic patterning of colloids on an electrode surface," *2013 AIChE Annual Meeting, Annual Meeting of the American Electrophoresis Society*, San Francisco, CA, Nov. 3 – 8, 2013 (Oral).
32. **SJ Williams** and NG Green, "Design of electrothermal pumps using resistive heaters," *2013 AIChE Annual Meeting, Annual Meeting of the American Electrophoresis Society*, San Francisco, CA, Nov. 3 – 8, 2013 (Oral).
31. **SJ Williams** "Rapid electrokinetic patterning and sorting of colloids" (video, selected from top abstracts submitted) *2013 Kentucky EPSCoR Annual Conference*, Louisville, KY, Oct. 17, 2013 (Video/Oral).
30. KE Heacox, BH Fasciotto, RW Cohn, and **SJ Williams**, "Electrohydrodynamic flows generated using a nanoneedle," *9th Kentucky Innovation & Entrepreneurship Conference*, Lexington, KY, August 29, 2013 (Poster).
29. **SJ Williams**, V Velasco, A Mishra, J-S Kwon, and ST Wereley, "Rapid electrokinetic patterning (REP): manipulating colloids from nanoparticles to bacteria," *2013 Kentucky Nano Symposium*, Louisville, KY, Aug. 16-17, 2013 (Oral).
28. KE Heacox, BH Fasciotto, RW Cohn, and **SJ Williams**, "Electrohydrodynamic flows generated using a nanoneedle," *2013 Kentucky Nano Symposium*, Louisville, KY, Aug. 16-17, 2013 (Poster).

27. A Mishra, K Clayton, R Thakur, **SJ Williams**, A Kumar, S Wereley, "Rapid Optoelectrokinetic manipulation of nanoparticles," *Advances in Microfluidics & Nanofluidics*, South Bend, IN, May 24-26, 2013 (Oral).
26. J-S Kwon, V Velasco, **SJ Williams**, ST Wereley, "Rapid electrokinetic patterning technique for manipulation of colloids and microorganisms, and its technical advancement," *Advances in Microfluidics & Nanofluidics*, Notre Dame, IN, May 24-26, 2013 (Oral).
25. NR Wood, AI Wolsiefer, KE Heacox, RW Cohn, and **SJ Williams**, "Dielectrophoretic capture of nanoparticles with a self-assembled nanoprobe," *Advances in Microfluidics & Nanofluidics*, Notre Dame, IN, May 24-26, 2013 (Oral).
24. V Velasco, **SJ Williams**, and RS Keynton, "A microfluidic chip for impedance analysis and characterization of human umbilical vein endothelial cells under fluid shear stress," *7th International Conference on Microtechnologies in Medicine and Biology (MMB2013)*, Marina Del Rey, CA, April 10-12, 2013 (Poster).
23. V Velasco and **SJ Williams**, "Electrokinetic concentration and patterning of colloids with thin film resistors," *Proc. ASME/IMECE*, Presentation #2012-87541, Houston, TX, Nov. 9-15, 2012 (Oral).
22. J Duff and **SJ Williams** "Dielectrophoretic precipitation of airborne particles," *Proc. ASME/IMECE*, Presentation #2012-89927, Houston, TX, Nov. 9-15, 2012 (Oral).
21. MJ Gruenthal, V Velasco, RE Berson, RS Keynton, and **SJ Williams**, "Impedance analysis of endothelial cells in development of an orbital shear platform," *2012 AIChE Annual Meeting, Annual Meeting of the American Electrophoresis Society*, Pittsburgh, PA, Oct. 28 – Nov. 2, 2012 (Poster).
20. KE Heacox, NR Wood, AI Wolsiefer, RW Cohn, and **SJ Williams**, "Manipulation of nanoparticles using electro-kinetics generated by nano-needles," *2012 AIChE Annual Meeting, Annual Meeting of the American Electrophoresis Society*, Pittsburgh, PA, Oct. 28 – Nov. 2, 2012 (Poster).
19. AH Work, Jr., V Velasco, and **SJ Williams**, "Rapid electrokinetic patterning (REP) of hydrosol colloids at a planar electrode," *2012 AIChE Annual Meeting, Annual Meeting of the American Electrophoresis Society*, Pittsburgh, PA, Oct. 28 – Nov. 2, 2012 (Oral).
18. AH Work, Jr., V Velasco, and **SJ Williams**, "Patterning simple geometries with colloids using a scanning laser," *2012 AIChE Annual Meeting, Annual Meeting of the American Electrophoresis Society*, Pittsburgh, PA, Oct. 28 – Nov. 2, 2012 (Poster).
17. NR Wood, AI Wolsiefer, RW Cohn, and **SJ Williams**, "Trapping of nanoparticles with dielectrophoretic nano-probes," *2012 AIChE Annual Meeting, Annual Meeting of the American Electrophoresis Society*, Pittsburgh, PA, Oct. 28 – Nov. 2, 2012 (Oral).
16. V Velasco, MJ Gruenthal, RS Keynton, and **SJ Williams**, "A microfluidic platform for impedance analysis and characterization of human umbilical vein endothelial cells," *2012 AIChE Annual Meeting, Annual Meeting of the American Electrophoresis Society*, Pittsburgh, PA, Oct. 28 – Nov. 2, 2012 (Oral).
15. V Velasco, RS Keynton, and **SJ Williams**, "Colloid concentration and sorting with double layer electrokinetics," *Colloids and Nanomedicine*, Amsterdam, The Netherlands, July 15-17, 2012 (Poster).
14. NR Wood, AI Wolsiefer, KE Heacox, RW Cohn, and **SJ Williams**, "Trapping of nanoparticles with dielectrophoretic nanoneedles," *8th Kentucky Innovation & Entrepreneurship Conference*, Louisville, KY, June 1, 2012 (Poster).
13. **SJ Williams** and RW Cohn, "The ElectroOptics Research Institute and Nanotechnology Center's Huson Nanotechnology Core Facility," *1st Annual Kentucky Nanotechnology Symposium*, Bowling Green, KY, March 30-31, 2012 (Oral).

12. V Velasco, AH Work, Jr., and **SJ Williams**, "Rapid electrokinetic self-assembly and patterning of colloids," *1st Annual Kentucky Nanotechnology Symposium*, Bowling Green, KY, March 30-31, 2012 (Oral & Poster).
11. NR Wood, AI Wolsiefer, KE Heacox, RW Cohn, and **SJ Williams**, "Trapping of nanoparticles with dielectrophoretic nanoneedles," *1st Annual Kentucky Nanotechnology Symposium*, Bowling Green, KY, March 30-31, 2012 (Oral & Poster).
10. **SJ Williams**, "Colloidal aggregation and concentration through double layer polarization," *2011 AIChE Annual Meeting, Annual Meeting of the American Electrophoresis Society*, Minneapolis, MN, Oct. 16-21, 2011 (Oral).
9. V Velasco, K King, **SJ Williams**, and RS Keynton, "Development of an automated microfluidic platform for impedance analysis of the endothelium," *2011 BMES Annual Meeting*, Hartford, CT, Oct. 12-15, 2011 (Poster).
8. **SJ Williams**, A Kumar, J-S Kwon, R Thakur, and ST Wereley, "Rapid and dynamic multiscale manipulation based on an optoelectric device," *Proceedings of the 2010 IEEE-EDS University Government Industry Micro/Nano Symposium*, West Lafayette, IN, July 1, 2010 (Oral).
7. ST Wereley, **SJ Williams**, A Kumar, H-S Chuang, J-S Kwon, and C Smith, "Opto-electric manipulation of droplets and colloids for material assembly," *2010 Materials Research Society Spring Meeting*, Invited Presentation, San Francisco, CA, April 5-9, 2010 (Oral).
6. **SJ Williams**, A Kumar, and ST Wereley, "Continuous colloidal concentration and patterning with optically induced AC electrokinetics," *2009 AIChE Annual Meeting, Annual Meeting of the American Electrophoresis Society*, Nashville, TN, Nov. 8-13, 2009 (Oral).
5. **SJ Williams**, D Hilgart, and RS Keynton, "Fabrication of a microfluidic platform for impedance analysis of endothelial monolayers," *2009 BMES Annual Meeting*, Pittsburgh, PA, Oct. 7-10, 2009 (Poster).
4. A Kumar, **SJ Williams**, and ST Wereley, "Rapid electrokinetic patterning of colloids using optical landscapes," *MF3 Industrial Advisory Board Meeting*, Napa, CA, Jan 13, 2009 (Oral).
3. ST Wereley, **SJ Williams**, and A Kumar, "Optoelectronic micro/nano particle manipulation for biological applications," *2nd International Symposium on LifeChips*, Invited Presentation, Irvine, CA, Jan. 9-10, 2009 (Oral).
2. **SJ Williams**, SD Peterson, A Kumar, and ST Wereley, "Three dimensional transport of an optically induced electrothermal microvortex," *APS/DFD Annual Meeting*, Pres. # LN.00003, San Antonio, TX, Nov. 23-25, 2008 (Oral).
1. **SJ Williams**, A Kumar, and ST Wereley, "Rapid colloidal assembly with optically induced electrokinetic forces," *Proceedings of the 2008 IEEE-EDS University Government Industry Micro/Nano Symposium*, Louisville, KY, July 13-16, 2008 (Oral).

Invited Speaker and Participant

19. **SJ Williams**, "Dynamic light scattering (DLS) and whiskey colloids," Quality Collaboration: Chill Haze Analysis, Bardstown, Kentucky, October 19, 2022.
18. Invited panel speaker: "Perspective of Soft Matter Research in Space: Present & Future", ACS Spring 2022 meeting (virtual), San Diego, California, March 20, 2022.
17. **SJ Williams**, "Field-directed self assembly of colloidal suspensions," University of Louisville, August 9, 2021 (virtual).
16. **SJ Williams**, "There are particles in my whisky! (The science of whiskey colloids)", Fermilab Colloquium, March 17, 2021 (virtual).

15. **SJ Williams**, “Evaporated drops of dilute American whiskeys self-assemble into unique web-like microstructures,” Case Western Reserve University, November 5, 2020 (virtual).
14. **SJ Williams**, “There are particles in my whiskey! Characterization and self-assembly of bourbon whiskey colloids,” Purdue University, September 11, 2019.
13. **SJ Williams**, “Whiskey webs and authenticating Kentucky Bourbon,” Engineers Without Borders/ Water Professionals Annual Meeting, March 29, 2019.
12. **SJ Williams**, “Characterization and self-assembly of bourbon whiskey colloids,” University of Louisville, Chemical Engineering Seminar, March 1, 2019.
11. **SJ Williams**, “Design of a dielectrophoretic microfluidic platform for single-particle dielectric spectroscopy,” Joint School of Nanoscience and Nanoengineering, Greensboro, NC, September 9, 2017.
10. **SJ Williams**, “Isomotive dielectrophoresis for dielectric spectroscopy of individual particles,” University of Illinois Chicago, Chicago, Illinois, April 4, 2017.
9. **SJ Williams**, B King, Md M Rahman, M Moradi, JJ Lee, D Bergman, A Penn, D Ryan, GA Willing, and H Rathnayake “Investigating long-term colloid stability in microgravity,” *Space Grant Directors Southeast Regional Meeting*, Lexington, KY, September 28-30, 2016.
8. **SJ Williams**, “Electrohydrodynamic assembly and sorting of colloids,” Western Kentucky University, Bowling Green, Kentucky, February 19, 2016.
7. **SJ Williams**, “AC electrokinetics & dielectrophoresis in microsystems,” PGXL Laboratories, Louisville, Kentucky, January 24, 2014.
6. **SJ Williams**, “Electrohydrodynamic trapping, patterning, and sorting of colloids,” University of Kentucky, Oct. 1, 2013.
5. **SJ Williams**, “Real-time in vitro analysis of the endothelium using impedance techniques,” *Engineering Platforms for Exploring Cellular and Molecular Processes* seminar series, University of Louisville, Dec. 5, 2012
4. **SJ Williams**, “Applications of microfluidic velocimetry techniques,” University of Louisville Cardiovascular Innovation Institute, Oct. 27, 2011.
3. **SJ Williams**, “Optically controlled electrokinetic manipulation of micro- and nanoparticles,” Virginia Tech., May 2, 2011.
2. **SJ Williams**, A Kumar, and ST Wereley, “Rapid electrokinetic patterning,” Arryx Inc., Chicago, IL, Nov. 19, 2008.
1. **SJ Williams**, A Kumar, and ST Wereley, “Rapid electrokinetic patterning,” Arryx Inc., Chicago, IL, Feb. 18, 2008.

Patents & Intellectual Property

Patents

1. Medical device for intraoperative measurement and interpretation of bone density during spinal surgery. US Patent Application Serial No. 63/020,263. (ULRF Ref: 19049-01) Filed May 5, 2021.

Provisional Patents

1. Isomotive dielectrophoresis for dielectric analysis of particle subpopulations. US Provisional Patent Application Serial No. 62/359,850. (ULRF Ref.: 14074) Filed July 8, 2017.

Grants – Funded (Total: \$2,870,102 | SJ Williams’ Share: \$1,897,863)

24. P Raghavan, D Owens, C Bell, “NSF I-Corps (Track 1): Mid-South Region,” NSF Translational Impacts (#2229521), 1/2023-12/2027, \$15,000,000. Sub-award to UofL is \$1,000,000. This is a cooperative grant lead by Vanderbilt University. **SJ Williams** is part of the UofL NSF I-Corps team. *[SJ Williams share: \$53,133 (est.). The \$15M amount is not included SJ Williams’ above Total.]*
23. **SJ Williams**, “REU: Nano Halo software development,” REU-22-022, NASA Kentucky Space Grant Consortium, Research Experience for Undergraduates (Student: Justin Murphy), 08/15/2022-08/14/2023, \$6,831.
22. **SJ Williams**, “Dielectric characterization of biological nanoparticles using a dielectrophoretic slide,” NSF BIO, Innovation: Instrumentation (#2140245), 10/2022-9/2025, \$358,793.
21. **SJ Williams**, “MCA: Precision electrospinning training to enhance electrokinetic filtration and spectroscopy”, NSF CMMI, Advanced Manufacturing (#2121008), 01/2021-12/2023, \$363,697.
 - Received a supplement for this award for a 2022 Capstone Design Project (#2211378), \$4,000
20. **SJ Williams**, M Voor, and M Boakye, “Verify Probe: Intraoperative device for measurement of bone quality,” KYNETIC Program, NIH, University of Louisville, 01/2022 – 12/2022, \$73,958. *[SJ Williams share: \$24,653]*
19. **SJ Williams** (Science-PI), A Martin (Managing-PI), and GA Willing, “Electrokinetic assembly of stable nanoparticle haloing suspensions,” NASA EPSCoR, 80NSSC20M0140, 10/1/20-09/31/23, \$100,000 *[SJ Williams share: \$40,500]*
18. M Boakye, M Voor, and **SJ Williams**, “A device for intraoperative measurement and interpretation of bone density during spinal surgery,” University of Louisville Innovation Grant, 08/2019 – 07/2020, \$25,000. *[SJ Williams share: \$8,333]*
17. M Boakye, M Voor, and **SJ Williams**, “Verify Probe: a device for intraoperative measurement and interpretation of bone strength during spinal surgery,” ExCITE Program, NIH REACH Hub, University of Louisville, 08/2019 – 02/2020, \$25,000. *[SJ Williams share: \$8,333]*
 - Our team received a second tranche of \$25,000 in ExCITE funding (12/2019-02/2020). *[SJ Williams share: \$8,333]*
 - Our team received \$10,000 in consulting fees for prototype development (LEAP)
16. **SJ Williams**, “Establishing standards for whiskey web analysis,” University of Louisville, Undergraduate Research Grant, 06/2018 – 05/2019, \$3,000.
15. **SJ Williams** (Science-PI), S Smith (Managing-PI), and GA Willing, “Enhanced science on the ISS: Influence of gravity on electrokinetic and electrochemical assembly in colloids”, NASA EPSCoR, NNH17ZHA001C (80NSSC17M0033), 08/03/17-08/02/20 \$100,000. *[SJ Williams share: \$40,500]*
14. **SJ Williams** (Academic Lead), MZ Rashed, and MM Rahman (Entrepreneurial Leads), “Isomotive dielectrophoresis (isoDEP) for dielectric spectroscopy of individual cells”, University of Louisville NSF I-Corps, 01/17/2017-01/16/2018, \$2,500.
13. **SJ Williams** and RD Bradshaw, “Acoustic mixing of sealed microfluidic wells in support of NASA ACE missions”, GF-17-025, NASA Kentucky Space Grant Consortium, Graduate Fellowship (Student: Daniel Allen), 05/01/2017-04/30/2018, \$38,400 *[SJ Williams share: \$28,800]*
12. **SJ Williams** and S Hendricks, “Isomotive dielectrophoresis for enhanced analyses of cell subpopulations”, NSF BIO, IDBR Type A (#1550509), 04/01/2016-03/31/2019, \$372,500. *[SJ Williams share: \$304,834]*

11. **SJ Williams**, “Self-assembly of colloids for enhanced solar cells”, UF-16-006, NASA Kentucky Space Grant Consortium, Undergraduate Fellowship (Student: David Bergman), 01/01/2016-12/31/2016, \$6,000.
10. **SJ Williams**, “Dielectrophoresis in air for autonomous dust manipulation and analysis”, UF-16-005, NASA Kentucky Space Grant Consortium, Undergraduate Fellowship (Student: Daniel Allen), 01/01/2016-12/31/2016, \$6,000.
9. **SJ Williams** (Science-PI), S Smith (Managing-PI), GA Willing, H Rathnayake, and J Lumpp, “Influence of Gravity on Electrokinetic and Electrochemical Colloidal Self-Assembly for Future Materials”, NASA EPSCoR, NNX14AN28A (14-EPSCoR-0011), 10/01/2014-09/30/2019, \$1,050,000 (\$750,000 NASA EPSCoR, \$300,000 Kentucky EPSCoR) [*SJ Williams share: \$425,000*].
8. **SJ Williams**, “Microfluidic platform for impedance characterization of endothelial cells under fluid shear stress” University of Louisville, Project Completion Grant, 06/01/2014-05/31/2015, \$4,000.
7. **SJ Williams**, “Development of an electrokinetic self-cleaning air filter (ESCAF) to support NASA missions” NASA Kentucky EPSCoR, RIDG-14-003, 07/01/2014-12/31/2015, \$20,000.
6. **SJ Williams** (PI) and RE Berson (Co-PI), “Impedance analysis of endothelial cells undergoing orbital shear”, University of Louisville, Multidisciplinary Research Grant, 01/2012-12/2012, \$10,000.
5. **SJ Williams** (PI) and RW Cohn (Co-PI), “Dielectrophoretic nanoneedles for trapping and characterization of sub-cellular entities”, Kentucky Science and Engineering Foundation (KSEF), RDE-2298-014. 07/2011 – 12/2013, \$80,000.
4. **SJ Williams**, “Electrokinetic filtration of neutrally charged airborne microparticles,” University of Louisville, Research Initiation Grant, 01/2011 – 12/2011, \$4,790.
3. **SJ Williams**, “Development of an optoelectrowetting platform at the University of Louisville,” University of Louisville, Undergraduate Research Grant, 01/2011 – 12/2011, \$3,000.
2. **SJ Williams**, “Microfluidic pumping with optically induced carbon nanotube actuation,” University of Louisville, Undergraduate Research Grant, 01/2011 – 12/2011, \$3,000.
1. **SJ Williams**, “Suspended Single-Cell Shear-Induced Reactions Measured Using Micro-PIV,” National Science Foundation Graduate Research Fellowship. 05/2006 – 05/2009, \$121,500.

Non-Research Grants (Awards, Travel Grants, Equipment Acquisition, etc.)

7. **SJ Williams** was gifted equipment from HydroFLOW (Redmond, WA) valued at \$600, July 2022.
6. **SJ Williams**, Mid-Career Excellence Scholar / Ascending Star Fellow, Cohort 2022-2023, University of Louisville, \$4,500
5. **SJ Williams**, NASA Kentucky Travel Grant (RFP-12-003), 07/2014, \$1,000.
4. C Hansen, **SJ Williams**, and R Yang, “Student Poster Symposium at the ASME International Mechanical Engineering Congress and Exposition (ASME-IMECE); San Diego California; November 15-21, 2013,” National Science Foundation, CMMI-1343049, 08/10/2013-08/31/2014, \$49,946.
3. **SJ Williams**, Obtained hydraulic equipment from BW Rogers, Inc. (Louisville, KY) to supplement instruction in ME 544. Six items valued at \$3,950. 07/2013.
2. **SJ Williams**, NASA Kentucky Travel Grant (RFP-12-003), 06/2013, \$1,000.

1. TJ Huang, V Prakash, D Attinger, **SJ Williams**, "Student Poster Symposium at ASME Society-Wide Micro and Nano Technology Forum, Houston, Texas, November 9-15, 2012," National Science Foundation, CBET-1248221, 09/07/2012-08/31/2013, \$26,000.

TEACHING AND SCHOLARSHIP OF TEACHING**Courses Taught**Undergraduate Level Courses

Mechanics II: Dynamics (ME 206)
Fluid Mechanics I (ME 311)
Fluid Mechanics Laboratory (ME 312)
Engineering Measurements (ME 314)
Mechanical Engineering Lab (ME 315)
Machine Design I (ME 422)
Capstone Design (ME 497)

Graduate Level Courses

Introduction to Fluid Power Systems (ME 544)
Microfluidics (ME 575)
Experimental Fluid Mechanics (ME 675, also taught at GE Appliance Park)

Course Coordinator

Mechanics II: Dynamics (ME 206)
Fluid Mechanics Laboratory (ME 312)
Fluid Power Systems (ME 544)
Experimental Fluid Mechanics (ME 675)

Description of Relevant Courses

Mechanics II: Dynamics (ME 206): Study of the motions and forces of engineering systems. Topics include: kinematics and kinetics of particles, equations of motion, energy and momentum methods, and introduction to rigid body dynamics.

Fluid Mechanics I (ME 311): Introduction to fluid mechanics. Topics include: characteristics of fluids, fluid statics and kinematics, applications of the Bernoulli equation, conservative equations in integral and differential form, dimensional analysis and modeling.

Introduction to Fluid Power Systems (ME 544): Design methodology of hydraulic circuits and fluid power components. Study of rotary/linear actuators, hydrostatic transmissions, temperature control, contamination control, pneumatics, valves, and control components. Applied design projects and laboratory modules are required.

Experimental Fluid Mechanics (ME 670): This course provides a graduate-level introduction to the basic theory and practical application of several important experimental techniques used in fluid dynamics. Topics include techniques for the measurement of material properties, pressure, density, force, fluid velocity, temperature and heat flux. The course will also review applications of measurement techniques for hydraulics, microfluidics, and other special-case topics.

Microfluidics (ME 540): This course provides an introduction to the basic theory and practical applications of microfluidics. Topics include fluid mechanics at small scales, fabrication of microfluidic devices, methods of inducing and controlling flow, and techniques to measure fluid properties.

Teaching Evaluations

The following are student evaluations for all courses taught at the University of Louisville. Only one “composite” evaluation score, which relates various aspects of the instructor’s performance, is reported. All reported scores are on a scale from 5.0 (highest) to 0.0 (lowest). During this period, my average evaluation (weighted by number of responding students) was 4.02 and the unweighted department average was 3.82.

Course Title	Course	Term	Year	Enrolled Students	Responded Students	Evaluation	Dept. Norm
Mechanics II: Dynamics	ME206	Fall	2021	39	36	3.91	3.71
		Fall	2020	39	38	4.44	3.91
		Summer	2017	23	15	3.50	3.88
		Spring	2015	46	33	3.57	3.69
		Fall	2015	80	33	4.10	3.73
		Summer	2014	43	7	4.03	3.88
		Fall	2013	49	43	4.35	3.77
		Fall	2012	44	43	4.14	3.87
		Fall	2011	80	76	2.75	3.74
		Spring	2010	44	26	4.17	-
Fall	2009	45	38	3.98	-		
Fluid Mechanics I	ME311	Fall	2020	22	20	4.08	3.91
		Fall	2019	23	14	4.38	4.00
Fluids Lab	ME312	Summer	2016	26	6	3.04	3.60
Eng. Measurements	ME314	Fall	2010	26	12	3.61	-
Mech. Eng. Lab I	ME315	Fall	2010	10	7	2.89	-
Machine Design I	ME422	Spring	2011	27	25	3.79	3.79
		Summer	2010	19	14	4.54	-
Capston Design Project	ME497	Spring	2010	25	16	4.55	-
Intr. Fluid Power Sys.	ME544	Spring	2022	17	14	4.57	3.93
		Spring	2021	32	17	4.17	3.80
		Spring	2020	25	18	4.50	4.05
		Spring	2019	25	19	4.32	4.13
		Spring	2018	34	26	4.25	3.88
		Spring	2017	39	29	4.09	3.76
		Spring	2016	33	31	4.26	3.78
		Spring	2015	33	27	4.36	3.69
		Spring	2014	12	10	4.55	3.75
		Spring	2013	17	15	4.80	3.79
Spring	2012	30	28	4.42	3.69		
Microfluidics	ME575	Spring	2022	8	7	4.72	3.93
		Spring	2021	18	10	4.00	3.80
		Spring	2020	7	4	5.00	4.05
		Fall	2018	14	8	4.59	-
Experimental Fluid Mech.	ME675	Summer	2021	31	6	3.68	3.75
		Summer	2020	11	5	4.45	3.96
		Summer	2019	8	4	4.75	3.80
		Fall	2018	14	8	3.25	3.86
		Spring	2017	14	12	4.23	3.76
		Summer	2016	7	1	2.50	3.60
		Spring	2014	13	13	3.42	3.75
		Fall	2014	17	15	4.25	3.78

Class Guest Lectures

8. “Introduction to Dielectrophoresis,” Tutorial lecture, North Carolina State University, August 1, 2017.
7. “Dielectrophoresis & AC Electrokinetics,” BE 680, *Bio-Micro-Electro-Mechanical Systems*, University of Louisville, Professor Robert Keynton (03/2010, 02/2014, 02/2015, 02/2017).
6. “Electrowetting,” BE 680, *Bio-Micro-Electro-Mechanical Systems*, University of Louisville, Professor Robert Keynton (02/2014).
5. “Rapid Electrokinetic Patterning,” ECE 575, *Nanostructure Self-Assembly*, University of Louisville, Professor Robert Cohn (09/2010, 09/2012).
4. “Microfluidics: An Introduction,” ME 575, *Mechanics of Micro-Machines*, University of Louisville, Professor Thomas Berfield (10/2010, 10/2011).
3. “AC Electrohydrodynamics,” ECE 500, *Microfluidics*, University of Louisville, Professor Cindy Harnett (04/2010).
2. “Chips and Tricks: Microfluidic Fabrication Techniques,” ME 517, *Micro/Nanoscale Physical Processes*, Purdue University, Professor Steven T. Wereley (02/2009).
1. “Dielectrophoresis: An Introduction,” ME 697W, *Small-scale Fluid Mechanics*, Purdue University, Professor Steven T. Wereley (10/2008).

YouTube Channel: ULmicrofluidics

The YouTube channel “ULmicrofluidics” has over 20 experimental and educational videos. The videos with the most views are educational explaining the basics of electrokinetic phenomena: “[Introduction to Dielectrophoresis \(DEP\)](#)” (6,200+ views) and “[Introduction to isomotive dielectrophoresis \(isoDEP\)](#)” (4,400+ views).

Students Advised

Graduate Students (PhD)

6. Aaditya Venkatesha Babu Bangaru, January 2023 – present.
5. Tonoy K. Mondal, Fall 2022 – present.
4. Md Mahmudur “Rony” Rahman, Ph.D., “Long term colloid suspension in a vertically rotated system”, Fall 2015 – Fall 2021.
 - Received NSF I-Corps, “Isomotive dielectrophoresis (isoDEP) for dielectric spectroscopy of individual cells” (2017)
 - Received the 2019 ASGSR International Space Station U.S. National Lab Poster Award in Physical Sciences
3. Mohamed “Mido” Rashed, Ph.D., “Isomotive dielectrophoresis for enhanced analyses of cell subpopulations,” Fall 2016 – May 2021.
 - Doctoral Dissertation Completion Award, \$6,000 (Spring 2020)
 - Graduate Student Research Fund, \$300 (Fall 2017, Spring 2019)
 - KY Multiscale Fund, \$1,200 (Summer 2019)
 - Visiting researcher at CSLE Lab, EPFL, Lausanne, Switzerland (Spring 2019)
 - Received NSF I-Corps, “Isomotive dielectrophoresis (isoDEP) for dielectric spectroscopy of individual cells” (2017)
 - AIChE Society Travel Fund: \$550 (Fall 2017)
2. Vanessa Velasco, Ph.D., “A microfabricated platform for impedance analysis and characterization of adherent cells,” Fall 2010 – Fall 2015.

- Awarded Southern Regional Education Board State Doctoral Fellowship (Fall 2010)
 - Selected to attend the NanoBiophotonics Summer School, Urbana, Illinois (Summer 2011)
 - Six-month internship with Dr. Utkan Demirci at Harvard/MIT (Fall 2013)
 - Awarded \$500 travel grant to attend 2014 AIChE Annual Meeting (Fall 2014)
 - Received Carl Storm Underrepresented Minority Fellowship for support in the participation of the 2014 Physics & Chemistry of Microfluidics GRC.
1. Benjamin King, Ph.D., Spring 2015 – **(did not complete)**
 - Received ASGSR 2016 travel award (Fall 2016)
 - Received NSF I-Corps, “Isomotive dielectrophoresis (isoDEP) for dielectric spectroscopy of individual cells” (2017)
 - Received AES travel grant (Fall 2017)

Graduate Students (M.Eng.: Thesis option)

9. Adam Carrithers, M.Eng., “Methods for mass data acquisition of whiskey webs”, Fall 2018 – May 2020.
 - Received Departmental Alumni Award (May 2020)
8. Margaret Jett, M.Eng., “Electrical characterization of phytoplankton suspensions using impedance spectroscopy” August 2018 – August 2021.
7. Martin Brown, M.Eng., “Fluid flow analysis of diluted evaporating American whiskey droplets” May 2018 – August 2019.
6. Matthew Okruch, M.Sci. (GE Student) “Development of an Ergun-type equation to predict pressure drop through radial flow water filters”, August 2015 – December 2016.
5. Lazaro Galban, M.Sci. (GE Student) “Experimental hydraulic switch for dishwashers with a bottle blaster system,” August 2013 – August 2014.
4. Mark J. Gruenthal, M.Eng., “Impedance analysis of endothelial cells undergoing orbital shear,” Spring 2012 – Spring 2013.
3. Joseph “Nick” Duff, M.Eng., “Fabrication and analysis of an electrokinetic air filter,” Fall 2010 – Summer 2013.
2. Nicholas R. Wood, M.Eng., “Dielectrophoretic nanoneedles for trapping and characterization of sub-cellular entities,” Fall 2011 – Spring 2012.
1. Andrew H. Work, Jr., M.Eng., “Electrokinetic concentration and patterning of colloids with a scanning laser,” Fall 2011 – Summer 2012.
 - Selected for University of Louisville Doctoral Fellowship (Spring 2012)

Graduate Students (M.Eng.: Non-Thesis option, ME 645)

46. Maxwell Hanke, “Comparison of virtual wells and pedestals to study monolayer collapse,” Fall 2022.
45. Jonah Hermes, “HydroFLOW electrokinetic particle interactions,” Fall 2022.
44. Justin Bray, “Create and test flexible resistive/capacitive materials for sensitive compressive sensing,” Fall 2022.
43. Tonoy K. Mondal “Tuning of electrospinning parameters for nanofiber mats,” Fall 2021-Summer 2022.
42. Joellyn Ketrin, “Development of dynamic light scattering test to measure whiskey stability of varying filtration levels,” Fall 2021-May 2022.
41. Claire Benson, “Controlled collapse of chemical monolayers,” Fall 2021-May 2022.

40. Jacob Blumeier, "Numerical simulation of bimodal colloidal suspensions under a rotating gravitational field," Spring 2021.
39. Allison Burba, "Dynamic light scattering study of bourbon whiskey to verify quality results obtained using other methods," Spring 2020.
38. Ryan Day, "Repeatability testing of bourbon agitation system," Spring 2020.
37. Carlea E. Brown, "Assessment of isomotive dielectrophoresis with streaming particles," Fall 2019.
36. Neal R. McKierman, "Shake the fake: determining counterfeit whiskeys from bubble formation," Fall 2019.
35. Sarah M. Ziegler, "Effect of age and mash bill on whiskey web surface area coverage," Fall 2019 – Spring 2020.
34. Maclean T. Welsh, "Investigating the chemical basis of whiskey web formation," Spring 2019-Fall 2019.
33. Jacob Zimmerman, "Electrokinetic concentration of nanoparticles within a uniform electric field" Fall 2018-Spring 2019.
32. Katrina Boone, "Correlating the intrinsic properties of bourbon with whiskey web formation" Fall 2018.
31. Mark Reeves, "Separation of nanoparticles by parallel-plate electrokinetics," Spring 2018 – Summer 2018.
30. Patrick Haas, "Illumination of whiskey web images," Spring 2018 - present.
29. Audie Reed, "Design and fabrication of a module Quake valve," Spring 2018 - present.
28. Chris Gruner, "Alcohol by volume identification of bourbon microdroplets via image analysis," Spring 2018.
27. Willis Lee, "Scaling law analysis of 3D liquid drop coalescence using high speed videography technique," Fall 2017.
26. Arvind B. Iyer, M.Eng., "Analysis of 2-D drop coalescence using a high-speed camera," Spring 2017.
25. Nicholas Hubbard, M.Eng., "Accounting for wall-induced drag for particle tracking analysis," Spring 2017.
24. Evan Henry, M.Eng., Fall 2016-Spring 2017.
23. Jacob Weigel, M.Eng., "Electrokinetic repulsion of particles: directionality study," Spring 2016.
22. Thomas Cushing, M.Eng., "Effect of electrode separation on dust repulsion by standing wave dielectrophoresis," Spring 2015-Spring 2016.
21. John Tangney, M.Eng., "Electrokinetic particle sorting and repulsion," Fall 2015
20. Matthew Larkin, M.Eng., "An investigation of the dielectrophoretic force of uniform spherical particles in a standing wave field," Fall 2015
19. Matthew J. Baker, M.Eng., "Experimental measurement of orbital fluid mechanics," Fall 2015
18. Andrew Sudkamp, M.Eng., "Electrorotation (ROT) of porous microparticles," Spring 2015.
17. Victoria Hutchinson, M.Eng., "Particle filtration utilizing alternating current dielectrophoresis," Fall 2014.
16. Alexander Hack, M.Eng., "Simulating microgravity on earth for colloidal samples," Fall 2014.
15. Devin O'Brien, M.Eng., "Mixing of colloidal particles in a capillary using PZT piezoelectric ultrasonic vibrations," Fall 2014.
14. Daniel Allgeier, "Particle manipulation using glass micropipettes utilizing dielectrophoresis," Spring 2014.

13. Seth Hannan, M.Eng., “Electrohydrodynamic analysis of nanoneedles and nanoparticle trapping” Spring 2013.
12. Joshua Weil, M.Eng., Spring 2013.
11. Nathan Romero, M.Eng., “Efficacy of CNC milled, PCB based, electrokinetic microfluidic devices,” Fall 2012.
10. Jeremy Jones, M.Eng., “Feasibility and testing of an AC electrokinetic filter,” Fall 2012.
9. Liam Parkes, M.Eng. Fall 2012 – Spring 2013.
8. James Lee Tucker, M.Eng., “Shaping of colloid aggregations using an infrared scanning laser,” Fall 2011 – Spring 2012.
7. Bennie R. LaPrade, M.Eng., “Analysis of the opto-mechanical response of a carbon-nanotube composite diaphragm,” Fall 2011 – Spring 2012.
6. Amanda Wolsiefer, M.Eng., “Particle manipulation using rapid electrokinetic patterning and electrowetting,” Fall 2012 – Spring 2013.
 - Undergraduate Research Assistant, Spring 2012 – Summer 2012.
5. Corey Abrams, M.Eng., “Electrokinetic colloid self-assembly,” Spring 2012.
4. Dustin Webb, M.Eng., “Two color particle shadow velocimetry,” Spring 2012.
3. Tyler Cookson, M.Eng., “Development of an optical trapping system using commercially-available components,” Spring 2011.
2. Mandy Scott, M.Eng., “Development of an optical trapping system using commercially-available components,” Spring 2011.
1. Tim Viola, M.Eng., “Hydrodynamic motion study of a micro-particle using programmed dielectrophoretic agitation,” Spring 2011.

Undergraduate Students

(* denotes supported UofL co-op students: 11 positions total)

28. *Holton Shults. Mechanical Engineering coop student working on NSF dielectrophoresis slide project. Spring 2023.
27. *Elayne Rebecca Shelby. Bioengineering coop student working on KYNETIC spinal instrumentation project. Fall 2022.
26. *Axel Gumira. Mechanical Engineering coop student working on NSF electrospinning project and NSF dielectrophoretic slide project. Fall 2022.
25. *Logan Covert. Mechanical Engineering coop student working on NSF electrospinning project and ISS research project. Fall 2022.
24. *Gerhardus Loohuis. Mechanical Engineering coop student working on KYNETIC spinal instrumentation project. Summer 2022.
23. Evelyn Khong. Mechanical Engineering part-time student working on KYNETIC spinal instrumentation project. Summer 2022.
22. Isaac Kraan. Undergraduate Mechanical Engineering part-time student part of the ELLC summer program working on vibration and packaging associated with the ISS project. Summer 2022.
21. Kristopher Luck (NSF REU student from Murray State University), “Controlled collapse and patterning of monolayers using hydrophobic surfaces,” Summer 2022.
20. Joshua D. Zynak (NSF REU student from Eastern Kentucky University), “Extracting multibody potentials to describe colloidal self-assembly,” Summer 2022.
19. *Devin S. Mattox. Worked on NSF electrospinning project. Co-op student, Summer 2022.

18. **Justin Murphy. Worked on International Space Station research project (programming, packaging, etc.) and NSF electrospinning project. Co-op student, Fall 2021, Summer 2022.
17. *Amelia Franxman. Bioengineering co-op student working on the KYNETIC spinal instrumentation project. Spring 2022.
16. Bryce Thompson. Mechanical Engineering student working part time on the KYNETIC spinal instrumentation project. Spring 2022, Summer 2022.
15. Abel Alhussainawi. Electrical engineering student who worked on the AC electric field module for the ISS experiment. 2021-2022.
14. Chloe Henson (NSF REU student from Western Kentucky University), “Electrokinetic self-assembly of colloids,” Summer 2021.
13. Daniel Foushee, ELLC Summer Research Program, “Whiskey web research” Summer 2019.
12. Adam Carrithers, Mechanical Engineering student supported under EVPRI grant (Fall 2018 – Spring 2019).
 - Received travel grant to attend APS DFD 2018 (Atlanta, GA)
11. Lincoln Curry (NSF REU student from Western Kentucky University), research on isomotive dielectrophoresis, Summer 2018.
10. Bailey Woods, prepare for NASA ISS colloid experiments (Fall 2017 to Summer 2018).
9. Grason K. Gasser (NSF REU student from Georgia Tech), research on isomotive dielectrophoresis, Summer 2017.
8. Kevin “KC” Grome, Bioengineering student supported under NSF IDBR (Summer and Fall 2017).
7. Robert Accolla (NSF REU student from Virginia Tech), research on insulative-based isomotive dielectrophoresis, Summer 2016.
 - Selected by NNCI for a Research Experience in Japan (Summer 2017)
 - 2016 ASME Track 19 NSF Student Poster Competition travel award (Fall 2016)
6. Daniel Allen, worked on air-based dielectrophoresis and isomotive dielectrophoresis (BS) and acoustic microfluidics (MEng)
 - Selected as Speed School Banner Bearer (Outstanding Student), December 2016
 - Received ASGSR travel grant (Fall 2017)
5. David Bergman, “Self-assembly of colloids for enhanced solar cells” (2016)
4. Esther Zusstone, “Label-free electrokinetic immunoassay analysis of magnetic particles” BIOL 405, Spring 2014
3. Andrew Survant, Undergraduate Research Assistant, electrokinetic hydrodynamic methods, 2013.
2. *Samuel Wills, Co-op student, Conducted numerical simulations using COMSOL 4.3 studying electrokinetics and electrohydrodynamics of nanoneedles, Fall 2013.
1. Shawn Day, B.S., Undergraduate Research Assistant, “Development of an optoelectrowetting platform at the University of Louisville,” Spring 2011.

High School Students

2. Chandni Bhikha, “Microfluidic mixing in microgravity environments,” Manual High School, 2013 – 2014.
1. Kainat Ahmed, “Enhancing micro-channel structure of contactless dielectrophoresis device for more efficient separation of particles,” Manual High School, 2013.

Dissertation/Thesis Committee Member

36. Rajiv Singh, Ph.D., Chemistry, (ongoing).
35. Marzieh Moradi, "Aggregation dynamics of bulk nanoparticle haloing systems and the influence of non-ambient temperatures," Ph.D., Chemical Engineering, Summer 2021.
34. Brianna Price, "Image analysis of colloidal systems for pair and triplet correlations," M.Eng., Chemical Engineering, Spring 2021.
33. Adam J. Cecil, "Image analysis of charged biomodal colloidal systems in microgravity," M.Eng., Chemical Engineering, Spring 2021.
32. Landon H. Tompkins, "Development of a pediatric cardiac assist maglev pump for use with a universal driver system," Ph.D., Translational Bioengineering, Fall 2020.
31. Md. Emtias Chowdhury, "Design, synthesis and application of Janus gold nanoprisms for directed self-assembly," Ph.D., Chemistry, Fall 2020.
30. Moustafa H. Meki, "Development and evaluation of a biomimetic cardiac tissue slice system to assess the effects of diminished pulsatility on cardiac tissue during mechanical unloading with CFLVAD," Ph.D., Translational Bioengineering, Fall 2021
29. Luke T. Hawtrey, "Stabilization of bimodal colloidal systems via nanoparticle haloing in microgravity," M.Eng., Chemical Engineering, Fall 2019.
28. John A Karlen III, "Feasibility study of intelligent LVAD control for optimal heart failure therapy," M.Eng., Bioengineering, Summer 2019.
27. Xiaoming Fan, "Development and characterization of biopolymer direct-write process for microvascular structures formation," Ph.D., Summer 2019.
26. Mohammad Mohaghegh Faghieh, "Improving flow-induced hemolysis prediction models," Ph.D., Mechanical Engineering, Spring 2019.
25. Jasmin Beharic, "Applications of polarized metallic nanostructures," Ph.D., Electrical and Computer Engineering, August 2017.
24. Thomas Tennill, "Automated analysis of cancerous histological samples," M.Eng., Bioengineering, May 2016.
23. Nathalie Tapolsky, M.Eng., Bioengineering, (expected Fall 2017).
22. Avanish Mishra, "Rapid electrokinetic patterning: theory and applications," Ph.D., Mechanical Engineering, (Purdue University), December 2016.
21. Jubin Chen, "Mechanics of electrode materials in lithium battery applications," Ph.D., Mechanical Engineering, August 2015.
20. Tom Lucas, "Development of a light-powered microstructure: enhancing thermal actuation with near-infrared absorbent gold nanoparticles," Ph.D., Electrical Engineering, August 2014.
19. Daniel Porter, "Bi-stable buckled energy harvesters actuated via torque arms," Ph.D., Mechanical Engineering, May 2015.
18. Alisha Bragg, Mechanical Engineering, M.Eng., August 2014.
17. Xiaoming Fan, "Photomechanical actuation of liquid crystal nanotube elastomers," MS, Mechanical Engineering, August 2014.
16. Muheng "Justin" Zhang, "Numerical investigation of hydrodynamic focusing and Coulter principle in a microfluidic device," Ph.D., Mechanical Engineering, May 2014.
15. Mai-Dung Nguyen, "Cardiac cell culture model (CCCM) as a left ventricle mimic for in-vitro cardiac tissue engineering," Ph.D., Mechanical Engineering, June 2014.

14. Adam Scarsella, "Apical left ventricular cannula sutureless implantation development," MEng., Bioengineering, December 2013.
13. Michael C. Clark, "Evaluation of drug release from abraxane and doxil in tumor tissue," MEng, Bioengineering, August 2013.
12. Tim Broering, "The characterization of wing-wing vortex interactions of a tandem flapping wing configuration and its relationship to the phase angle and wing spacing," Ph.D., Mechanical Engineering, July 2013.
11. Mitchell J. Buller, "Development of a physiologic ex vivo vessel perfusion system," M.Eng., Bioengineering, July 2013.
10. Jeremy E. Phillips, "Surface bound PEG-RGDS on PEG-DA hydrogels and its effects on RPE cell morphology and differentiation," M.Eng., Bioengineering, July 2013.
9. James Loomis, "Nanocarbon/elastomer composites: characterization and applications in photo-mechanical actuation," Ph.D., Mechanical Engineering, May 2013.
8. Thomas A. Priest, "Examination of diffusion of gold nanoshells into cancer tissues," M.Eng., Bioengineering, May 2013.
7. Peng Xu, "Near infrared photon-assisted polymerization of advanced polymer composites," Ph.D., Mechanical Engineering, May 2013.
6. Kurtis T. James, "Production of high yield gold/gold-sulfide nanoparticles via cellulose membrane," MEng, Bioengineering, May 2013.
5. Vahidreza Parichehreh, "Microfluidics approaches for label free cell separations," Ph.D., Mechanical Engineering, August 2012.
4. Dhruvinkumar Patel, "A novel high yield process for fold sulfide nanoparticle synthesis via shifting equilibrium of self-assembly reaction," M.Eng., Bioengineering, May 2012.
3. Brek Meuris, "Thermal analysis of lead zirconate titanate thin films using digital image correlation," MEng, Mechanical Engineering, December 2011.
2. Ruthie S. Fligor, "Quantification of vascular perfusion in the spinal cord after injury," M.Eng., Bioengineering, December 2011.
1. Julia Kar, "A forward dynamics simulation study of increasing load on the anterior cruciate ligament of the knee, for young women performing recreational drop jump activities," Ph.D., Mechanical Engineering, May 2011.

Independent Study

7. Lauren Reinersman, ME 688, "Environmental impacts of hydraulic systems", Summer 2022.
6. Tonoy Mondal, ME 688, "Microfluidics in the Spirits Industry", Spring 2022.
5. George B. Koenig, ME 688, "Development of the Uniti Connect System" Spring 2019.
4. Gabe Ruth, ME 588, "Colloid self-assembly using coplanar electrodes" Spring 2019.
3. Megan Brangers, ME 588, "Quantifying alcoholic 'burn'", Summer 2018.
2. Nicholas Schuppert, ME 688, "Surface flow contour reconstruction in oscillating petri dish using free-surface synthetic Schlieren method," Fall 2015
1. Jacob Sunding, "Electrothermal fluid flow," Spring 2011

SERVICE**Professional Activities**University of Louisville*University-Wide Committees & Service*

L3 Strategic Plan Implementation Subcommittee	2020 – 2021
---	-------------

Speed School of Engineering Committees & Service

Ad Hoc Committee for Faculty Research (Speed School)	2019
Speed School Diversity Committee	2013 – 2020

Mechanical Engineering Department Service

Curriculum Committee, Chair	2022 – present
Faculty Advisor, American Society of Mechanical Engineering, UofL Chapter	2022 – present
DFAC Committee	2017 – present
Program Assessment Committee, Chair	2016 – 2020
ME Department Faculty Honors Advisor	2011 – 2015
Program Assessment Committee	2010 – 2013
Webpage Committee, Chair	2010

Search Committees

Civil Eng., Assistant Professor	2021
Mechanical Eng., Assistant Professor Term	2020 – 2021
Mechanical Eng., Assistant Professor (Thermo-Fluids)	2018 – 2019
Mechanical Eng., Endowed Chair	2013 – 2015

External Service

James B. Beam Institute for Kentucky Spirits: Faculty Fellow	2022 – present
Kentucky Distillers' Association Kentucky Spirits Collaborative: Member	2020 – present
American Electrophoresis Society (AES): Councilor (i.e. Board Member)	2014 – present

Journal Editors

Journal of Distilling Science: Editorial Board	2021 – present
Biosensors and Biomolecular Electronics: Editorial Board	2021 – 2022

Reviewer of Textbooks & Chapters

• Reviewed <i>Fluid Power Engineering</i> by Galal Rabie, 2 nd Ed. (McGraw Hill)	2022
---	------

Reviewer of Manuscripts

• Advances in Mechanical Engineering	1 paper
• AIP Advances	1 paper
• Applied Physics Letters	2 papers
• Biomedical Microdevices	1 paper
• Biomicrofluidics	3 papers
• Colloids and Surfaces A: Physiochemical and Engineering Aspects	1 paper
• Electrophoresis	12 papers
• Food Chemistry	1 paper
• Frontiers in Bioengineering and Biotechnology	1 paper
• Journal of Colloid and Interface Science	2 papers
• Journal of Fluids Engineering	3 papers

- Journal of Physics: Condensed Matter 1 paper
- Journal of Physics D: Applied Physics 1 paper
- Journal of Micromechanics and Microengineering 8 papers
- Lab on a Chip 12 papers
- Measurement Science and Technology 1 paper
- Microfluidics and Nanofluidics 5 papers
- Micromachines 1 paper
- Microsystems and Nanoengineering 1 paper
- Physics 1 paper

Conference Paper Reviewer:

- ASME IMECE 2012 Conference
- ASME IMECE 2011 Conference
- ASME ICNMM 2011 Conference
- ASME IMECE 2010 Conference
- ASME FEDS-ICNMM 2010 Conference

Conference Organizer, Session Chair/Co-Chair, etc.

Session Organizer	<i>Wetting and Adhesion</i> , 97 th ACS Colloid & Surface Science Symposium (Raleigh, NC)	2023
Session Chair	<i>Drops: Sessile and Static Surface Interactions</i> , APS Division of Fluid Dynamics (Indianapolis, IN)	2022
Technical Committee Organization Committee	NNCI Nano + AM Summit (Louisville, KY)	2022
Session Co-Chair	<i>Bioengineering and Life Sciences</i> , KY Nano + AM Symposium (Louisville, KY)	2019
Session Chair	<i>Track K: General</i> , 93 rd ACS Colloid & Surface Science Symposium (Atlanta, GA)	2019
Session Chair	<i>MEMS</i> , KY Nano + AM Symposium (Louisville, KY)	2018
Conference Organizing Committee	Dielectrophoresis 2018 (Surrey, UK)	2018
Session Organizer and Co-Chair	2017 AIChE Annual Meeting, 2017 Annual Meeting of the American Electrophoresis Society (AES), <i>Soft Matter Electrokinetics: Particles, Drops and Bubbles</i>	2017
Session Organizer and Co-Chair	2016 AIChE Annual Meeting, Topical 3: 2016 Annual Meeting of the American Electrophoresis Society (AES), <i>Soft Matter Electrokinetics: Particles, Drops and Bubbles</i>	2016
Conference Organizing Committee	Dielectrophoresis 2016 (Boston, MA)	2016
Session Chair	American Society for Gravitational and Space Research (ASGSR), <i>Complex Fluids #1</i>	2015
Session Organizer and Co-Chair	2015 AIChE Annual Meeting, Topical 3: 2015 Annual Meeting of the American Electrophoresis Society (AES), <i>Soft Matter Electrokinetics: Particles, Drops and Bubbles</i>	2015
Session Co-Chair	ASME 2014 4 th Joint US-European Fluid Engineering Division Summer Meeting and 12 th International Conference on	2014

	Nanochannels, Microchannels, and Minichannels, <i>Electrokinetic Flow</i>	
Conference Organizing Committee	Dielectrophoresis 2014 (London, U.K.)	2014
Session Chair & Organizer	ASME IMECE 2014 Conference, <i>ASME Society-Wide Micro & Nano Technology Forum, Student Poster Competition</i>	2014
Session Chair & Organizer	2014 AIChE Annual Meeting, Topical 3: 2014 Annual Meeting of the American Electrophoresis Society (AES), <i>Soft Matter Electrokinetics: Particles, Drops and Bubbles</i>	2014
Session Chair & Organizer	ASME IMECE 2013 Conference, <i>ASME Society-Wide Micro & Nano Technology Forum, Student Poster Competition</i>	2013
Session Chair & Organizer	2013 AIChE Annual Meeting, Topical 3: 2013 Annual Meeting of the American Electrophoresis Society (AES), <i>Electrokinetic Behavior of Micro- and Nano-Particles: Directed Assembly Under Electric Fields.</i>	2013
Session Chair	2013 Kentucky Nano Symposium, <i>Life Sciences I</i>	2013
Vice-Session Chair	ASME IMECE 2012 Conference, <i>ASME Society-Wide Micro & Nano Technology Forum, Student Poster Competition</i>	2012
Session Co-Chair & Organizer	2012 AIChE Annual Meeting, Topical 3: 2012 Annual Meeting of the American Electrophoresis Society (AES), <i>Electrokinetic Behavior of Micro- and Nano-Particles: Directed Assembly Under Electric Fields.</i>	2012
Session Co-Chair	2011 AIChE Annual Meeting, Topical 3: 2011 Annual Meeting of the American Electrophoresis Society (AES), <i>Electroporation, Electrophysiology and Cell Electrokinetics.</i>	2011
Session Co-Chair	ASME Fluids Engineering Division Summer Meeting, <i>Microfluidics Summer Forum 2009, 29-1 Microfluidics: Bubbles and Surface Tension</i>	2009

Other Professional Activities

- RDR Science Review Panel: NASA ACE-T (Glenn Research Center), March 13, 2014

External Education and Service

- Louisville Regional Science and Engineering Fair: Open to all middle school and high school students in Jefferson County and 13 surrounding counties. Winners will compete at the state and national levels for scholarships, tuition grants, trips, and scientific equipment.
 - Member of the Board (2012 – present), Judging Committee (2013 – present), Vice President (2013 – 2014), Judge (2010 – 2012),
- 35 high school students participated in Kentucky Science Center's *Louisville Youth Summit* (July 9 & 10, 2019). We set up a thirty minute interactive science exhibit where students learned about droplet properties.

- Participated in Brown-Forman INSPIRE summer enrichment program. Gave a lecture on Mechanical Engineering careers and organized a hands-on activity where students measured the coefficient of restitution (July 2018, July 2019).
- Participated at the faculty panel discussion at the Society of Women Engineers' summer sleepover for the incoming freshmen class (2011, 2012, 2013).
- Organized engineering-related activities for the 'College for a Day' event for middle and high school boys and girls (2012, 2013).
- Purdue Space Day, Group Leader – Participated with and observed a group of 5th and 6th graders for a variety of space/engineering-related activities, Nov. 2008.
- Middle School MINDS (Mastering Ideas Necessary for Developing Students) – Planned and taught a fluid-mechanics based activity for a group of 7th and 8th graders, Fall 2005.
- Catholic School Athletic Association (CSAA), 5th and 6th grade football coach, Fall 2000 through Fall 2005.