

## David B. Go

*Viola D. Hank Professor of Aerospace and Mechanical Engineering  
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### HIGHLIGHTS

#### Research Record & Achievements

- Published over 90 articles (*h*-index: 39-Google Scholar; 30-Publons; *i10*-index: 81-Google Scholar), including seven invited review or perspective articles, and authored one book (*2<sup>nd</sup> edition now published*); named Royal Chemistry Society highly cited for 2019 (top 5% in citations)
- Hold or submitted seven patents, with two technologies being successfully licensed.
- Secured funding by nearly every major federal agency (NSF, NIH, DOE, AFOSR, ARO, DARPA) totaling ~\$14M as PI or Co-PI
- ASME Fellow, IEEE Senior Member, former President of Electrostatics Society of America, former Associate Editor for *Plasma Sources Science and Technology* (considered top journal in field), former Associate Editor for *Frontiers in Mechanical Engineering*, Editorial Board for *Journal of Electrostatics*, Editorial Board for *Plasma Sources Science and Technology*

#### Educational Accomplishments & Innovations

- Graduated 14 Ph.D. students as sole advisor (7) or co-advisor (5) and 4 M.S. students; mentored approximately 60 undergraduate researchers and seven high school researchers
- Taught 11 different undergraduate and graduate courses, both required and elective, including developing multiple new courses and mentoring independent project teams on industry-sponsored projects
- Steered the implementation of a new departmental curricular stem for undergraduate mechanical engineering design that involved reimagining and redesigning multiple design courses, including teaching the first implementation of a key new course
- Led the design and launching of a new 10,000 square foot undergraduate fabrication facility called the Engineering Innovation Hub, including developing and realizing a 2,000 square foot pilot facility, working with benefactors and College leadership to secure funding and equipment, and partnering with College leaders to hire the inaugural managing director and staff

#### Leadership Roles & Impact

- (*2023-present*) Vice President and Associate Provost for Academic Strategy responsible for the implementation and execution of the academic elements of the 2023 University Strategic Framework, the reappointment and promotion process for tenured and tenure-track faculty, new appointments for faculty with tenure, and academic space.
- (*2020-2023*) Department Chair for a department with 37 tenured/tenure-track (T/TT) faculty, 6 teaching faculty, 6 research faculty, 23 staff, and approximately 450 undergraduate students across two

majors (aerospace and mechanical engineering) and 180 graduate (Ph.D.) students across two programs (aerospace & mechanical engineering and bioengineering)

- (2018-2020) Department Director of Graduate Studies overseeing approximately 170 graduate students, primarily Ph.D. students, and leading the Graduate Studies Committee

## EDUCATION & PROFESSIONAL PROFILE

### Education

2008	Ph.D., Mechanical Engineering, Purdue University <i>Ion Generation and Ionic Wind Heat Transfer at Millimeter and Micrometer Scales</i> Advisors: Prof. Timothy S. Fisher, Prof. Suresh V. Garimella
2004	M.S., Aerospace Engineering, University of Cincinnati
2001	B.S., Mechanical Engineering, University of Notre Dame

### Professional Appointments & Positions

2022 – pres.	Viola D. Hank Professor of Aerospace and Mechanical Engineering, University of Notre Dame
2019 – 2021	Rooney Family Collegiate Professor of Engineering, University of Notre Dame
2019 – pres.	Professor, Aerospace and Mechanical Engineering, Concurrent Professor, Chemical and Biomolecular Engineering, University of Notre Dame
2015 – 2019	Rooney Family Associate Professor of Engineering, University of Notre Dame
2015 – 2019	Associate Professor, Aerospace and Mechanical Engineering, Concurrent Associate Professor, Chemical and Biomolecular Engineering, University of Notre Dame
2013 – 2015	Concurrent Assistant Professor, Chemical and Biomolecular Engineering, University of Notre Dame
2009 – 2015	Assistant Professor, Aerospace and Mechanical Engineering, University of Notre Dame
2008 – 2009	Instructor, Aerospace and Mechanical Engineering, University of Notre Dame
2004 – 2008	Graduate Research Assistant, School of Mechanical Engineering, Purdue University
2007	Research Intern, Mobile Platforms Group, Intel Corporation
2001 – 2004	Engineer, Edison Engineering Development Program, General Electric Aircraft Engines

### Leadership Appointments & Roles

2023 – pres.	Vice President and Associate Provost for Academic Strategy, University of Notre Dame (beginning June 01, 2023)
2020 – 2023	Department Chair, Aerospace and Mechanical Engineering, University of Notre Dame
2019 – 2022	President, Electrostatics Society of America
2019 – 2020	Faculty Fellow, Kaneb Center for Teaching and Learning, University of Notre Dame
2018 – 2020	Director of Graduate Studies, Aerospace and Mechanical Engineering, University of Notre Dame

## AWARDS & HONORS

### Personal

- Senior Member, Institute of Electrical and Electronics Engineers (IEEE), 2022
- 1<sup>st</sup> Source Bank Commercialization Award (2<sup>nd</sup> Place), IDEA Center, University of Notre Dame, 2021
  - For software licensed to Indiana Technology and Manufacturing Companies (ITAMCO) and formed basis for Atlas3D start-up in 2018 (<https://atlas3d.xyz/>), shared with collaborators David Hoelzle, Richard Billo, and Hao Peng

- Rev. Edmund P. Joyce, C.S.C. Award for Excellence in Undergraduate Teaching, University of Notre Dame, 2019
- Electrostatics Society of America (ESA) Rising Star Award, 2018
- Institute of Electrical and Electronics Engineers (IEEE) Nuclear & Plasma Sciences Society (NPSS) Early Achievement Award, 2018
- Fellow, American Society of Mechanical Engineers (ASME), 2016
- Electrochemical Society Toyota Young Investigator Fellowship, 2015
- National Science Foundation CAREER Award, 2013
- Air Force Office of Scientific Research Young Investigator Research Award, 2010
- James W. and Carolyn L. Taylor MUACC Travel Award, 2009, 2010
- University of Notre Dame Faculty Scholarship Award, 2010

### Advisees (select list)

- Eli J. and Helen Shaheen Graduate School Award in Engineering, University of Notre Dame, awarded to graduate student Hernan Delgado, 2021
- American Vacuum Society John Coburn and Harold Winters Student Award in Plasma Science and Technology, graduate student Hernan Delgado recognized as a *finalist*, 2019
- Department of Energy Rickover Fellowship Program in Nuclear Engineering, awarded to graduate student Daniel Martin, 2019
- International Conference on Plasma Science (ICOPS), Student Paper Award, awarded to graduate student Xi Tan, 2017
- International Conference on Plasma Science (ICOPS), Student Paper Award – 1<sup>st</sup> Runner Up, awarded to graduate student Xi Tan, 2016
- American Vacuum Society John Coburn and Harold Winters Student Award in Plasma Science and Technology, awarded to graduate student Paul Rumbach, 2014
- International Conference on Plasma Science (ICOPS), Student Paper Award – Honorable Mention, awarded to graduate student Michael Johnson, 2014
- NASA Space Technology Research Fellowship, awarded to graduate student John Haase, 2013

## RESEARCH & SCHOLARSHIP

### Synopsis

Expertise in plasma science & engineering, thermal-fluid sciences, and chemical analysis with contributions to novel electronics cooling, fundamental scaling of non-thermal plasmas, the use of non-thermal plasmas to drive chemical transformations, innovative plasma sources, thermal modeling of manufacturing processes, and microfluidic devices for early disease detection. Significant accomplishments with collaborators include:

- Developing theoretical descriptions for gas breakdown at microscale dimensions accounting for additional physics unique to the microscale
- Directly measuring the solvation of plasma electrons into water at a plasma-liquid interface and their subsequent reactions
- Revealing scaling behavior and optimal material selection for plasma-catalyst interactions
- Developing a rapid computational framework for simulating metal 3D printing and optimizing part orientation
- Engineering microfluidic devices for the rapid detection of RNA from extra-cellular vesicles for early cancer screening

(\* indicates Notre Dame graduate student; # indicates undergraduate student)

### Journal Articles (refereed)

1. H. Sharma, V. Yadav, C. D'Souza-Schorey, D. B. Go, S. Senapati, H.-C. Chang, "A scalable high-throughput continuous isoelectric fractionation microfluidic platform for isolation of extracellular RNA nanocarriers," *ACS Nano*, vol. 17, pp. 9388-9404, 2023.
2. L. L. Alves, M. M. Becker, J. van Dijk, T. Gans, D. B. Go, K. Stapelmann, J. Tennyson, M. M. Turner, M. J. Kushner, "Foundations of Plasma Standards," *Plasma Sources Science and Technology*, vol. 32, art. no. 023001, 2023. **(invited perspective)**
3. K. P. McCarthy\*, D. B. Go, Senapati, H.-C. Chang, "An integrated ion-exchange membrane-based microfluidic chip for irreversible dissociation and quantification of miRNA from ribonucleoproteins," *Lab on a Chip*, vol. 23, pp. 285-294, 2023.
4. F. J. Alamos\*, M. Philo, D. B. Go, S. R. Schmid, "Rough surface contact under creep conditions," *Tribology International*, vol. 176, art. no. 107916, 2022.
5. N. Turan\*, M. Saeidi-Javash, Y. Zhang, D. B. Go, "Does plasma jet sintering follow an Arrhenius-type expression?" *Plasma Processes and Polymers*, vol. 19, art. no. 2200011, 2022.
6. B. Mateescu et al., "Phase 2 of extracellular RNA communication consortium charts next-generation approaches for extracellular RNA research," *iScience*, vol. 25, art. no. 104653, 2022
7. C. Yan, C. Waitt, I. Akintola\*, G. Lee\*, J. Easa, R. Clarke, F. Geng, D. Poirier, H. O. Otor, G. Rivera-Castro, D. B. Go, C. P. O'Brien, J. C. Hicks, W. F. Schneider, "Recent advances in plasma catalysis," *Journal of Physical Chemistry C*, vol. 126, pp. 9611-9614, 2022. **(invited virtual collection, also featured in ACS Catalysis and I&EC)**
8. J. Yang\*, E. V. Barnat, S.-K. Im, D. B. Go, "Spatiotemporally-resolved measurements of electric field around a piezoelectric transformer using electric-field induced second harmonic (E-FISH) generation," *Journal of Physics D: Applied Physics*, vol. 55, art. no. 225203, 2022.
9. G. Lee\*, D. B. Go, C. P. O'Brien, "Direct observation of plasma-stimulated activation of surface species using multi-modal in-situ/operando spectroscopy combining polarization-modulation infrared reflection-absorption spectroscopy, optical emission spectroscopy, and mass spectrometry," *ACS Applied Materials and Interfaces*, vol. 13, pp. 56242-56253, 2021.
10. D. T. Elg, H. E. Delgado\*, D. C. Martin\*, R. M. Sankaran, D. M. Bartels, P. Rumbach, D. B. Go, "Recent advances in understanding the role of solvated electrons at the plasma-liquid interface of solution-based gas discharges," *Spectrochimica Acta B*, vol. 186, art. no. 106307, 2021. **(invited review)**
11. N. Turan\*, M. Saeidi-Javash\*, J. Chen, M. Zeng, Y. Zhang, D. B. Go, "Atmospheric pressure and ambient temperature plasma jet sintering of aerosol jet printed silver nanoparticles," *ACS Applied Materials and Interfaces*, vol. 13, pp. 47244-47251, 2021.
12. F. J. Alamos\*, M. Philo, D. B. Go, S. R. Schmid, "Creep contact analysis of a power law-shaped asperity with a rigid flat surface," *Tribology International*, vol. 160, art. no. 107039, 2021.
13. D. C. Martin\*, D. M. Bartels, P. Rumbach, D. B. Go, "Experimental confirmation of solvated electron penetration scaling at a plasma-liquid interface," *Plasma Sources Science and Technology*, vol. 30, art. no. 03LT01, 2021.
14. H. E. Delgado\*, G. H. Brown<sup>#</sup>, D. M. Bartels, P. Rumbach, D. B. Go, "The scaling of kinetic and transport behaviors in the solution-phase chemistry of a plasma-liquid interface," *Journal of Applied Physics*, vol. 129, art. no. 083303, 2021.
15. O. K. Jaenicke<sup>#</sup>, F. G. Hita Martinez<sup>#</sup>, J. Yang\*, S.-K. Im, D. B. Go, "Hand-generated piezoelectric mechanical-to-electrical energy conversion plasma," *Applied Physics Letters*, vol. 117, 093901, 2020. (Editor's Pick and Featured Article)
16. A. Guajardo-Cuellar, D. B. Go, M. Sen, "Analysis of energy transport behavior and geometric effects in graphene," *Frontiers of Mechanical Engineering*, vol. 6, art. no. 41, 2020.
17. P. Mehta, P. M. Barboun, Y. Engelmann, D. B. Go, A. Bogaerts, W. F. Schneider, J. C. Hicks, "Plasma-catalytic ammonia synthesis beyond the equilibrium limit," *ACS Catalysis*, vol. 10, pp. 6726-6734, 2020.

18. N. Turan\*, P. M. Barboun, P. K. Nayak<sup>#</sup>, J. C. Hicks, D. B. Go, "Development of a small-scale helical surface dielectric barrier discharge for characterizing plasma-surface interfaces," *Journal of Physics D: Applied Physics*, vol. 29, art. no. 045016, 2020.
19. J. Yang\*, S.-K. Im, D. B. Go, "Time-resolved characterization of a free plasma jet formed off the surface of a piezoelectric crystal," *Plasma Sources Science and Technology*, vol. 29, art. no. 045016, 2020.
20. H. Delgado\*, D. T. Elg, D. M. Bartels, P. Rumbach, D. B. Go, "Chemical analysis of secondary electron emission from a water cathode at the interface with a non-thermal plasma," *Langmuir*, vol. 36, pp. 1156-1164, 2020.
21. Z. Chao, K. B. Sezginel, K. Xu, G. M. Crouch, A. E. Gray, C. E. Wilmer, P. W. Bohn, D. B. Go, S. K. Fullerton-Shirey, "Dynamics of silver nanofilament formation in a polymer-ionic liquid thin-film by direct-write," *Advanced Functional Materials*, art. no. 1907950, 2019.
22. P. Rumbach, A. E. Lindsay, D. B. Go, "Turing patterns on a plasma-liquid interface," *Plasma Sources Science and Technology*, vol. 28, art. no. 105014, 2019.
23. Z. Ramshani, C. Zhang, K. Richards, L. Chen, G. Xu, B. L. Stiles, R. Hill, S. Senapati, D. B. Go, H.-C. Chang, "Extracellular vesicle miRNA quantification from plasma using an integrated microfluidic device," *Communications Biology*, vol. 2, art. no. 189, 2019.
24. P. Barboun, P. Mehta, F. A. Herrera\*, D. B. Go, W. F. Schneider, J. C. Hicks, "Distinguishing plasma contributions to catalyst performance in plasma-assisted ammonia synthesis," *ACS Sustainable Chemistry & Engineering*, vol. 7, pp. 8621-8630, 2019.
25. P. Mehta, P. Barboun, D. B. Go, J. C. Hicks, W. F. Schneider, "Catalysis enabled by plasma activation of strong bonds: a review," *ACS Energy Letters*, vol. 4, pp. 1115-1133, 2019. **(invited review)**
26. H. E. Delgado\*, R. C. Radomsky<sup>#</sup>, D. C. Martin\*, D. M. Bartels, P. Rumbach, D. B. Go, "Effect of competing oxidizing reactions and transport limitation on the Faradaic efficiency in plasma electrolysis," *Journal of the Electrochemical Society*, vol. 166, pp. E181E186, 2019.
27. D. Han, G. M. Crouch, Z. Chao, S. K. Fullerton-Shirey, D. B. Go, P. W. Bohn, "Nanopore-templated silver nanoparticle arrays photopolymerized in zero-mode waveguides," *Frontiers in Chemistry*, vol. 7, art. no. 216, 2019.
28. F. A. Herrera\*, G. Brown<sup>#</sup>, P. Barboun, N. Turan\*, P. Mehta, W. F. Schneider, J. C. Hicks, D. B. Go, "The impact of transition metal catalysts on macroscopic dielectric barrier discharge (DBD) characteristics in an ammonia synthesis plasma catalysis reactor," *Journal of Physics D: Applied Physics*, vol. 52, art. no. 224002, 2019. **(special issue)**
29. X. Tan\*, D. B. Go, "Rational design of plasma-enhanced catalysis at microscale dimensions for the dissociation of CO<sub>2</sub>," *Journal of Electrostatics*, vol. 97, pp. 71-74, 2019.
30. P. Rumbach, D. M. Bartels, D. B. Go, "The penetration and concentration of free radicals at a plasma-liquid interface," *Plasma Sources Science and Technology*, vol. 27, art. no. 115013, 2018.
31. Z. Chao, B. P. Radka, K. Xu., G. M. Crouch, D. Han, D. B. Go, P. W. Bohn, S. K. Fullerton-Shirey, "Direct-write formation and dissolution of silver nanofilaments in ionic liquid-polymer electrolyte composites," *Small*, vol. 14, art. no. 1802023, 2018.
32. H. Peng, M. Ghasri-Khouzani, S. Gong, R. Attardo, P. Ostiguy, B. A. Gatrell, J. Budzinski, C. Tomonto, J. Neidig, M. Ravi Shankar, R. Billo, D. B. Go, D. Hoelzle, "Fast prediction of thermal distortion in metal powder bed fusion additive manufacturing: Part 2, a quasi-static thermo-mechanical model," *Additive Manufacturing*, vol. 22, pp. 869-882, 2018.
33. H. Peng, M. Ghasri-Khouzani, S. Gong, R. Attardo, P. Ostiguy, B. A. Gatrell, J. Budzinski, C. Tomonto, J. Neidig, M. Ravi Shankar, R. Billo, D. B. Go, D. Hoelzle, "Fast prediction of thermal distortion in metal powder bed fusion additive manufacturing: Part 1, a thermal circuit network model," *Additive Manufacturing*, vol. 22, pp. 852-868, 2018.

34. S. Marczak, K. Richards, Z. Ramshani, E. Smith, S. Senapati, R. Hill, D. B. Go, H.-C. Chang, “Simultaneous isolation and preconcentration of exosomes by ion concentration polarization,” *Electrophoresis*, vol. 39, pp. 2029-2038, 2018.
35. P. Mehta, P. Barboun, F. A. Herrera\*, J. Kim, P. Rumbach, D. B. Go, J. C. Hicks, W. F. Schneider, “Overcoming ammonia synthesis scaling relations with plasma-enabled catalysis,” *Nature Catalysis*, vol. 1, pp. 269-275, 2018.
36. X. Tan\*, D. B. Go, “Understanding the scaling of electron kinetics in the transition from collisional to collisionless conditions in microscale gas discharges,” *Journal of Applied Physics*, vol. 123, art. no. 063303, 2018.
37. H. E. Delgado\*, P. Rumbach, D. M. Bartels, D. B. Go, “Total internal reflection absorption spectroscopy (TIRAS) for the detection of solvated electrons at a plasma-liquid interface,” *Journal of Visualized Experiments*, vol. 131, art. no. e56833, 2018.
38. D. B. Go, J. R. Haase\*, J. George, J. Mannert, A. Nojeh, R. Nemenich, “Thermionic energy conversion in the 21st century: Advances and opportunities for space and terrestrial applications,” *Frontiers in Mechanical Engineering*, vol. 3, art. no. 13, 2017.
39. S. Ghosh, R. Hawtof, P. Rumbach, D. B. Go, R. Akolkar, R. M. Sankaran, “Quantitative study of electrochemical reduction of Ag<sup>+</sup> to Ag nanoparticles in aqueous solutions by a plasma cathode,” *Journal of the Electrochemical Society*, vol. 64, pp. D818-D824, 2017.
40. M. J. Johnson, D. B. Go, “Recent advances in electrohydrodynamic pumps operated by ionic winds: A review,” *Plasma Sources Science and Technology*, vol. 26, art. no. 103002, 2017. **(invited review)**
41. K. Yoshida, M. J. Johnson\*, D. B. Go, “Enhancement of thin air jets produced by ring-shaped dielectric barrier discharges using an auxiliary electrode,” *Journal of Electrostatics*, vol. 87, pp. 293-301, 2017.
42. P. Rumbach, D.B. Go, “Perspectives on plasmas in contact with liquids and its relationship to electrocatalysis for chemical processing and materials synthesis,” *Topics in Catalysis*, vol. 60, pp. 799-811, 2017. **(invited perspective)**
43. D. B. Go, M. Z. Atashbar, Z. Ramshani, H.-C. Chang, “Surface acoustic wave devices for chemical sensing and microfluidics: a review and perspective,” *Analytical Methods*, vol. 9, pp. 4112-4134, 2017. **(invited review)**
44. P. Rumbach, J.-P. Clarke<sup>#</sup>, D. B. Go, “Electrostatic Debye layer formed at a plasma-liquid interface,” *Physical Review E*, vol. 95, art. no. 053203, 2017.
45. G. M. Crouch\*, D. Han, S. K. Fullerton-Shirey, D. B. Go, P. W. Bohn, “Addressable direct-write nanoscale filament formation and dissolution by nanoparticle-mediated bipolar electrochemistry,” *ACS Nano*, vol. 11, pp. 4976-4984, 2017.
46. J. Kim, D. B. Go, J. C. Hicks, “Synergistic effects of plasma-catalyst interactions for CH<sub>4</sub> activation,” *Physical Chemistry Chemical Physics*, vol. 19, pp. 13010-13021, 2017.
47. F. Herrera\*, T. Luo, D. B. Go, “Thermal rectification under transient conditions: The role of thermal capacitance and thermal conductivity,” *Journal of Heat Transfer*, vol. 139, art. no. 091301, 2017.
48. R. J. Flaherty\*, S. A. Sarver, L. Sun, G. Brownell, D. B. Go, N. J. Dovichi, “A high voltage power supply that mitigates current reversals in capillary zone electrophoresis-electrospray mass spectrometry,” *Journal of American Society of Mass Spectrometry*, vol. 28, pp. 247-252, 2017.
49. X. Tan\*, N. Griggs<sup>#</sup>, K. L. Jensen, D. B. Go, “Theoretical analysis of 1D resonant tunneling behavior in ion-enhanced cold field and thermo-field emission,” *Journal of Applied Physics*, vol. 120, art. no. 213301, 2016.
50. M. J. Johnson\*, D. B. Go, “Impingement cooling using the ionic wind generated by a low-voltage piezoelectric transformer,” *Frontiers in Mechanical Engineering*, vol. 2, art. no. 7, 2016.
51. P. Rumbach\*, R. Xu, D. B. Go, “Electrochemical production of oxalate and formate from CO<sub>2</sub> by solvated electrons produced using an atmospheric-pressure plasma,” *Journal of the Electrochemical Society*, vol. 163, pp. F1157-F1161, 2016.

52. Z. Ramshani\*, M. J. Johnson\*, M. Atashbar, D. B. Go, "A broad area electrospray actuated by a piezoelectric transformer," *Applied Physics Letters*, vol. 109, art. no. 044103, 2016.
53. X. Mu\*, Z. Song, Y. Wang, Z. Xu, D. B. Go, T. Luo, "Thermal transport in oxidized polycrystalline graphene," *Carbon*, vol. 108, pp. 318-326, 2016.
54. M. A. Bilici, J. R. Haase\*, C. Boyle, D. B. Go, R. M. Sankaran, "Experimental evidence for the transition from a field emission-driven Townsend discharge to a self-sustained microplasma," *Journal of Applied Physics*, vol. 119, art. no. 223301, 2016.
55. J. Kim, M. S. Abbott, D. B. Go, J. C. Hicks, "Enhancing C-H bond activation of methane via temperature-controlled, catalyst-plasma interactions," *ACS Energy Letters*, vol. 1, pp. 94-99, 2016.
56. T. Jiang, X. Zhang, S. Vishwanath, X. Mu\*, V. Kanzyuba, D. Sokolov, S. Ptasinka, D. B. Go, H. Xing, T. Luo, "Covalent bonding modulated graphene-metal interfacial thermal transport," *Nanoscale*, vol. 8, pp. 10993-11001, 2016.
57. J. R. Haase\*, D. B. Go, "Analysis of thermionic and thermo-field emission in microscale gas discharges," *Journal of Physics D: Applied Physics*, vol. 49, art. no. 055206, 2016.
58. M. J. Johnson\*, D. B. Go, "Piezoelectric transformers for low-voltage generation of gas discharges and ionic winds in atmospheric air," *Journal of Applied Physics*, vol. 118, art. no. 2343304, 2015.
59. P. Rumbach\*, D. M. Bartels, R. M. Sankaran, D. B. Go, "The effect of air on solvated electron chemistry at a plasma/liquid interface," *Journal of Physics D: Applied Physics*, vol. 48, art. no. 424001, 2015. **(invited)**
60. P. Rumbach\*, D. M. Bartels, R. M. Sankaran, D. B. Go, "The solvation of electrons by an atmospheric pressure plasma," *Nature Communications*, vol. 6, art. no. 7248, 2015.
61. D. Taller\*, K. Richards\*, Z. Slouka, S. Senapati, R. Hill, D. B. Go, H.-C. Chang, "On-chip surface acoustic wave lysis and ion-exchange nanomembrane detection of exosomal RNA for pancreatic cancer study and diagnosis," *Lab on a Chip*, vol. 15, pp. 1656-1666, 2015. **(cover article)**
62. M. J. Johnson\*, R. Tirumala\*, D. B. Go, "Analysis of geometric scaling of miniature multi-electrode assisted corona discharges for ionic wind generation," *Journal of Electrostatics*, vol. 74, pp. 8-14, 2015.
63. M. J. Johnson\*, D. B. Go, "Ferroelectric crystals for the low-voltage operation of surface dielectric barrier discharges," *Applied Physics Letters*, vol. 105, art. no. 264102, 2014.
64. X. Mu\*, T. Zhang\*, D. B. Go, T. Luo, "Coherent and incoherent phonon thermal transport in isotopically modified graphene superlattices," *Carbon*, vol. 83, pp. 208-216, 2014.
65. D. B. Go, A. Venkatraman, "Microscale gas breakdown: ion-enhanced field emission and the modified Paschen's curve," *Journal of Physics D: Applied Physics*, vol. 47, art. no. 503001, 2014. **(invited review)**
66. P. Rumbach\*, N. Griggs<sup>#</sup>, R. M. Sankaran, D. B. Go, "Visualization of electrolytic reactions at a plasma-liquid interface," *IEEE Transactions on Plasma Science*, vol. 42, pp. 2610-2611, 2014.
67. P. Rumbach\*, Y. Li\*, S. Martinez<sup>#</sup>, T. J. Twahirwa<sup>#</sup>, D. B. Go, "Experimental study of electron impact ionization in field emission-driven microdischarges" *Plasma Sources Science and Technology*, vol. 23, art. no. 065026, 2014.
68. Y. Li\*, D. B. Go, "The quantum mechanics of ion-enhanced field emission and how it influences microscale gas breakdown," *Journal of Applied Physics*, vol. 116, art. no. 103306, 2014.
69. M. J. Johnson\*, J. Linczer<sup>#</sup>, D. B. Go, "Thermally induced atmospheric pressure gas discharges using pyroelectric crystals," *Plasma Sources Science and Technology*, vol. 23, art. no. 065018, 2014.
70. S. A. Sarver\*, N. Chetwani, N. J. Dovichi, D. B. Go, C. A. Gartner, "A comparison of AC and DC electrospray ionization for mass spectrometry," *The Journal of the American Society of Mass Spectrometry*, vol. 25, pp. 524-529, 2014.
71. X. Mu\*, X. Wu\*, T. Zhang\*, D. B. Go, T. Luo, "Thermal transport in graphene oxide – From ballistic extreme to amorphous limit," *Scientific Reports*, vol. 4, art. no. 3909, 2014.

72. R. Tirumala\*, D. B. Go, "Comparative study of corona discharge simulation techniques for electrode configurations inducing non-uniform electric fields," *Journal of Electrostatics*, vol. 72, pp. 99-106, 2014.
73. Y. Li\*, D. B. Go, "Using field emission to control the electron energy distribution in high-pressure microdischarges at microscale dimensions," *Applied Physics Letters*, vol. 103, art. no. 234104, 2013.
74. J. Z. Woodruff<sup>#</sup>, A. P. C. Buccellato, P. Brenner, D. B. Go, "Environmentally Opportunistic Computing: A distributed waste heat reutilization approach to energy-efficient buildings and data centers," *Energy and Buildings*, vol. 69, pp. 41-50, 2013.
75. P. Rumbach\*, M. Witzke, R. M. Sankaran, D. B. Go, "Decoupling interfacial reactions between plasmas and liquids: Charge transfer vs. plasma neutral reactions," *Journal of the American Chemical Society*, vol. 135, pp. 16264-16267, 2013.
76. D. Taller\*, D. B. Go, H.-C. Chang, "Modulated exponential films generated by surface acoustic waves and their role in liquid wicking and aerosolization at a pinned drop," *Physical Review E*, vol. 87, art. no. 053004, 2013.
77. Y. Li\*, R. Tirumala\*, P. Rumbach\*, D. B. Go, "The coupling of ion-enhanced field emission and the discharge during microscale breakdown at moderately high pressures," *IEEE Transactions on Plasma Science*, vol. 41, pp. 24-35, 2013.
78. D. B. Go, "Theoretical analysis of ion-enhanced thermionic emission for low-temperature, non-equilibrium gas discharges," *Journal of Physics D: Applied Physics*, vol. 46, art. no. 035202, 2013.
79. D. Taller\*, D. B. Go, H.-C. Chang, "Self-similar micro and nanodrops generated by acoustic and Maxwell pressures of scattered and transmitted surface acoustic waves," *Physical Review Letters*, vol. 109, art. no. 224301, 2012.
80. P. Rumbach\*, D. B. Go, "Fundamental properties of field emission-driven DC microdischarges," *Journal of Applied Physics*, vol. 112, art. no. 103302, 2012.
81. M. Witzke, P. Rumbach\*, D. B. Go, R. M. Sankaran, "Evidence for the electrolysis of water by plasmas formed at the surface of aqueous solutions," *Journal of Physics D: Applied Physics*, vol. 45, art. no. 442001, 2012.
82. Y. Wang\*, M. K. Tan, D. B. Go, H.-C. Chang, "Electrospray cone-jet breakup and droplet production for electrolyte solutions," *Europhysics Letters*, vol. 99, art. no. 64003, 2012. **Editor's Choice**
83. R. Tirumala\*, D. B. Go, "The multi-electrode assisted corona discharge for electrohydrodynamic flow generation in narrow channels," *IEEE Transactions on Dielectrics and Electrical Insulation*, vol. 18, pp. 1854-1863, 2011.
84. J. Ho, M. K. Tan, D. B. Go, L. Y. Yeo, J. R. Friend, H.-C. Chang, "A paper-based microfluidic surface acoustic wave sample delivery and ionization source for rapid and sensitive ambient mass spectrometry," *Analytical Chemistry*, vol. 83, pp. 3260-3266, 2011. (Accelerated Article)
85. N. Chetwani\*, C. A. Cassou<sup>#</sup>, D. B. Go, H.-C. Chang, "Frequency dependence of AC electrospray ionization mass spectrometry," *Analytical Chemistry*, vol. 83, pp. 3017-3023, 2011.
86. R. Tirumala\*, Y. Li\*, D. A. Pohlman<sup>#</sup>, D. B. Go "Corona discharges in sub-millimeter electrode gaps," *Journal of Electrostatics*, vol. 69, pp. 36-42, 2011.
87. R. Tirumala\*, D. B. Go, "An analytical formulation for the modified Paschen's curve," *Applied Physics Letters*, vol. 97, art. no. 151502, 2010.
88. N. Chetwani\*, C. A. Cassou<sup>#</sup>, D. B. Go, H.-C. Chang, "High-frequency AC electrospray ionization source for mass spectrometry," *Journal of the American Society of Mass Spectrometry*, vol. 21, pp. 1852-1856, 2010.
89. D. B. Go, M. Sen, "Thermal rectification using bulk materials," *Journal of Heat Transfer*, vol. 132, art. no. 124502, 2010.
90. D. B. Go, D. A. Pohlman<sup>#</sup>, "A mathematical model of the modified Paschen's curve for breakdown in microscale gaps," *Journal of Applied Physics*, vol. 107, art. no. 103303, 2010.



91. A. Guajardo-Cuellar\*, D. B. Go, M. Sen, "Evaluation of heat current formulations for equilibrium molecular dynamics calculations of thermal conductivity," *Journal of Chemical Physics*, vol. 132, art. no. 104111, 2010.
92. D. B. Go, T. S. Fisher, S. V. Garimella, V. B. Bahadur, "Planar microscale ion generation devices in atmospheric air with diamond-based electrodes," *Plasma Sources Science and Technology*, vol. 18, art. no. 035004, 2009.
93. D. B. Go, T. S. Fisher, S. V. Garimella, "Direct simulation of ionization and ion transport for planar microscale ion generation devices," *Journal of Physics D: Applied Physics*, vol. 42, art. no. 055203, 2009.
94. D. B. Go, R. A. Maturana, T. S. Fisher, S. V. Garimella, "Enhancement of external forced convection by ionic wind," *International Journal of Heat Mass and Transfer*, vol. 51, pp. 6047-6053, 2008.
95. D. B. Go, S. V. Garimella, T. S. Fisher, R. K. Mongia, "Ionic winds for locally enhanced cooling," *Journal of Applied Physics*, vol. 102, art. no. 053302, 2007.
  - also in *Virtual Journal of Nanoscale Science and Technology*, vol. 16, no. 14, 2007.

## Book

1. D. B. Go, *Ionization and Ion Transport: A primer for the study of non-equilibrium, low-temperature gas discharges and plasmas*, Institute of Physics (IOP) Concise Physics Series
  - 1<sup>st</sup> Edition, Morgan & Claypool Publishers: San Rafael, CA, 2018. (ISBN 978-1-6817-4601-2)
  - 2<sup>nd</sup> Edition, IOP Publishing Ltd: Bristol, UK, 2022. (ISBN 978-0-7503-3991-9)

## Book Chapters (invited)

1. K. E. Richards, D. B. Go, R. Hill, "Surface Acoustic Wave Lysis and Ion-Exchange Membrane Quantification of Exosomal MicroRNA," in *MicroRNA Detection and Target Identification: Methods and Protocols* (ed. T. Dalmay), Methods in Molecular Biology (vol. 1580), pp. 59-70, Springer: New York, 2017.
2. P. Brenner, D. Thain, A. P. C. Buccellato, D. B. Go "Environmentally Opportunistic Computing," in Handbook of Energy-Aware and Green Computing (ed. I. Ahmad, S. Ranka), CRC Press: New York, NY, 2012.

## Magazine Articles (invited)

1. R. Tirumala\*, D. B. Go, "Ionic Winds: A New Frontier for Air Cooling," *Electronics Cooling*, pp. 8-11, March 2012.

## Intellectual Property

### Patents

1. G. Brownell, D. B. Go, N. Dovichi, R. Flaherty, S. Sarver "CE Electrospray Distal-End Power Supply," PCT Application No. PCT/US2017/053520, U.S. Utility Patent 15/716,149 filed 09/26/2017. (U.S. Provisional Application No. 62/400,036, filed 09/26/2016)
  - licensed to CMP Scientific, 03/25/2019
2. H.-C. Chang, D. B. Go, Z. Slouka, S. Senapati, Y. Men, Z. Pan "AC Electrosprayed Droplets for Digital and Emulsion PCR," U.S. Patent 11,293,057, filed 05/09/2017 (application 16/304,870), issued 04/05/2022.
3. K.E. Richards, S. Marczak, Z. Ramshani, R. Hill, D. B. Go, H.-C. Chang, "Simultaneous Isolation and Preconcentration of Exosomes by Ion Concentration Polarization Method and Apparatus," U.S. Patent 10,983,035, issued 04/20/2021.
4. D. B. Go, Z. Ramshani\*, M. J. Johnson\*, M. Z. Atashbar "Apparatus and Method for Atomization of Fluid," U.S. Patent 10,946,407, issued 03/16/2021.

5. N. Chetwani, C. A. Cassou<sup>#</sup>, D. B. Go, H.-C. Chang, “Methods and Apparatus for Mass Spectrometry Utilizing an AC Electrospray Device,” U.S. Patent 8,716,675, issued 05/06/2014.
6. M. MacDonald, R. K. Mongia, D. B. Go “Flow Tube Apparatus,” U.S. Patent 8,274,228, issued 09/25/2012.
7. T. S. Fisher, S. V. Garimella, D. B. Go, R. K. Mongia “Various Methods, Apparatuses, and Systems that Use Ionic Wind to Affect Heat Transfer,” U.S. Patent 7,545,640, issued 06/09/2009.

### ***Invention Disclosures***

1. S. Benjamin, P. Burns, D. B. Go, D. Martin, “Uranium precipitation via plasma electrolysis,” Notre Dame Technology I.D. D-0480, filed 11/11/2022, U.S. Provisional Application No. 63/385,231, filed 11/29/2022.
2. S. Senapati, K. McCarthy, D. B. Go, H.-C. Chang, “An integrated ion-exchange membrane-based microfluidic chip for irreversible dissociation and quantification of RNA from ribonucleoproteins,” Notre Dame Technology I.D. D-0444, filed 06/09/2022, U.S. Provisional Application No. 63/367,414, filed 06/30/2022.
3. S. Senapati, H.-C. Chang, H. Sharma, D. B. Go “High Throughput Continuous Isoelectric Fractionation (CIF) Technology for Separation of Nanocarriers,” Notre Dame Technology I.D. D-0406, filed 11/05/2021, U.S. Provisional Application No. 63/268,483, filed 03/02/2022.
4. N. Turan, M. Saeidi-Javash, J. Chen, M. Zeng, Y. Zhang, D. B. Go, “Plasma Jet Sintering Apparatus and Process,” Notre Dame Technology I.D. D-0350, filed 02/15/2021.
5. D. Hoelzle, H. Peng, D. B. Go, R. Billo, J. Neidig, J. Budzinski, M.R. Shankar, P. Ostiguy, R. Attardo, S. Gong, B. A. Gatrell, C. Tomonto, “Thermal Stress, Thermal Distortion, and Design Optimization for the Direct Metal Laser Sintering Process,” Notre Dame Technology I.D. 16-067, filed 06/16/2016.
  - licensed to Indiana Technology and Manufacturing Companies (ITAMCO) and formed basis for Atlas3D start-up in 2018 (<https://atlas3d.xyz/>), sold to Siemens 2019

### **Invited/Keynote/Plenary Conference and Workshop Presentations**

1. D. B. Go, “Connecting the Dots: Understanding the Nature of Plasma and Liquid Interactions,” European Physics Society Conference on Plasma Physics, Amsterdam, Netherlands, 2022. – *delivered virtually*
2. D. B. Go, “Using Non-Thermal Plasmas to Direct Chemistry at Solid and Liquid Interfaces” International Workshop on Microplasmas, Raleigh, NC, 2022. – *delivered virtually*
3. D. B. Go, “Low Temperature Plasma Catalysis: Uncovering Synergies and Opportunities,” NSF Ecosystem for Collaborative Leadership and Inclusive Innovation in Plasma Science and Engineering (ECLIPSE) Meeting, Washington D.C., 2022.
4. D. B. Go, “Understanding the Behavior of Plasma Interaction with Liquid in Plasma Electrolysis,” International Conference on Plasma-Nano Technology and Science, Nagoya, Japan, 2022. – *delivered virtually*
5. D. B. Go, “Understanding the Behavior of Plasma Interaction with Liquid in Plasma Electrolysis,” Annual Meeting of MRS-J, Pacofico Yokohama North, Japan, 2021. – *delivered virtually*
6. D. B. Go, “Understanding and Designing Plasma-Catalysis Systems using Experiments and Simulations,” AVS International Symposium and Exhibition, Denver, CO, 2020. – *canceled due to COVID-19 pandemic*
7. D. B. Go, “The Mutual Roles of the Plasma and Liquid in Plasma Electrolysis,” ECS Meeting, Montreal, Canada, 2020. – *canceled due to COVID-19 pandemic; presented virtually at 2021 ECS Meeting*
8. D. B. Go, F. Herrera, G. Brown, N. Turan, P. Barboun, P. Mehta, W. F. Schneider, J. C. Hicks, “Comprehensive Studies Toward Understanding and Designing Plasma-Catalysis Systems,”

- American Chemical Society National Meeting & Expo, Philadelphia, PA, 2020. – *canceled due to COVID-19 pandemic, declined opportunity to present virtually*
9. D. B. Go, “Interfacial low-temperature plasmas for directing chemistry: Perspectives from plasma-liquids and plasma-catalysis,” *Advances and Applications in Plasma Physics (Nature Conference Series)*, St. Petersburg, Russia, 2019.
  10. D. B. Go, “Solvated electrons at a plasma-liquid interface,” *International Conference on Phenomena in Ionized Gases*, Sapporo, Japan, 2019.
  11. D. B. Go, “Rethinking the Design of Catalysts for Plasma-Catalysis Systems”, *International Symposium on Plasma Chemistry*, Naples, Italy, 2019.
  12. D. B. Go, “Field Emission and its Effect on Microdischarge Formation,” *Gaseous Electronics Conference*, Pittsburgh, PA, 2017.
  13. D. B. Go, “The Role of Field Emission on Plasma Formation at Microscale Dimensions,” *International Vacuum Nanoelectronics Conference*, Regensburg, Germany, 2017.
  14. D. B. Go “The Plasma-Catalyst Interaction: Exploring Synergistic Effects at High Temperature,” *International Symposium on Plasma Nanoscience*, Antwerp, Belgium, 2017.
  15. D. B. Go, “Electrolysis with Plasma Cathodes: Modeling and Experiments to Understand the Electrochemical Interface”, *ECS Meeting*, New Orleans, LA, 2017.
  16. D. B. Go, “Plasma Electrochemistry: Experiments and Modelling of the Plasma/Liquid Interface,” *International Conference on Plasmas with Liquids*, Prague, Czech Republic, 2017.
  17. D. B. Go, “On the Role of Field Emission in Atmospheric-Pressure Microscale Plasmas,” *International Vacuum Nanoelectronics Conference*, Vancouver, Canada, 2016.
  18. D. B. Go, “Solvated Electron Chemistry at the Plasma-Liquid Interface: Detection and Application to Chemical Processing”, *International Symposium on Plasmas for Catalysis and Energy Materials*, Tianjin, China, 2016.
  19. P. Rumbach, R. Xu, D. B. Go, “Electrochemical Reduction of  $\text{CO}_{2(\text{aq})}$  By Solvated Electrons at a Plasma-Liquid Interface,” *ECS Meeting*, San Diego, CA, 2016.
  20. D. B. Go, “Plasmas with Liquid Electrodes: Fundamental Processes and Applications to Chemical Processing”, *International Conference on Plasma-Nano Technology and Science*, Nagoya, Japan, 2016.
  21. D. B. Go, “Understanding Charge Transfer Reactions at the Interface of Plasmas in Contact with Liquids,” *International Conference on Reactive Plasmas/Gaseous Electronics Conference*, Honolulu, HI, 2015.
  22. D. B. Go, “A Microfluidic Approach to Exosomal RNA Analysis Using Surface Acoustic Wave Lysing and Ion-Exchange Membrane Sensing,” *Advances in Microfluidics and Nanofluidics*, Beijing, China, 2015.
  23. D. B. Go, “Atmospheric-Pressure Plasmas: a Radiation-Free Approach to Solvated Electrons,” *International Workshop on Microplasmas*, Newark, NJ, 2015.
  24. D. B. Go, “Atmospheric-Pressure Ionization Processes: New Approaches and Applications,” *International Conference on Electrostatics*, Southampton, England, 2015.
  25. D. B. Go, P. Rumbach\*, D. M. Bartels, R. M. Sankaran, “Detection of Solvated Electrons at a Plasma-Liquid Interface,” *Gaseous Electronics Conference*, Raleigh, NC, 2014.
  26. D. B. Go, “Surface Acoustic Wave Microfluidics for Chemical Analysis,” *Advanced Diagnostics and Therapeutics Annual Symposium*, Notre Dame, IN, 2014.
  27. D. B. Go, “Microplasmas for Enhanced Thermionic Emission,” *NASA Workshop on Thermionic Energy Conversion for Space and Earth*, Houston, TX, 2014.
  28. D. B. Go, “Electron-Initiated Reactions at the Interface of Plasmas and Liquids,” *International Symposium on Plasma Nanoscience*, Málaga, Spain, 2014.
  29. D. B. Go “Generating Dielectric Barrier-like Discharges using Polar, Non-Centrosymmetric Crystals,” *Gordon Research Conference on Plasma Processing Science*, Smithfield, RI, 2014.

30. D. B. Go, "Ion-Enhanced Field Emission for Control of Atmospheric Pressure Discharges" AFOSR Young Investigator Research Program, Arlington, VA, 2014.
31. Y. Li, P. Rumbach, D. B. Go, "Field Emission in Microscale Dimensions: A New Approach to Atmospheric Pressure Gas Discharges," AVS International Symposium and Exhibition, Long Beach, CA, 2013.
32. D. B. Go, "Using Surface Processes to Control Electron Energies in Discharges," International Symposium on Plasma Nanoscience, Asilomar, CA, 2013.
33. D. B. Go, "Microplasmas: A New Tool for Nanomaterial Synthesis and New Application for Nanomaterials," CMOS Emerging Technologies Research Symposium, Whistler, BC Canada, 2013.
34. D. B. Go, "Controlling Microdischarge Electron Energy Distributions with Surface Emission Processes," Workshop on Optical Properties of Plasma, University of Notre Dame, IN, 2013.
35. D. B. Go, "Paper-SAW Mass Spectrometry: The Fundamentals of Surface Acoustic Wave Nebulization using Paper Sample Delivery for Ambient Mass Spectrometry" SCIX Conference (The Federation of Analytical Chemistry and Spectroscopy Societies), Kansas City, MO, 2012.
36. D. B. Go, "Direct Current and Alternating Current Electrosprays: The Application of Electrostatics to Chemical Analysis," Annual Meeting of the Electrostatics Society of America, Cambridge, Canada, 2012.
37. D. B. Go, "Breakdown in Microscale Electrode Gaps: The Role of Ion-Enhanced Field Emission in the Modified Paschen's Curve," International Workshop on the Physics of Complex Plasmas, Potsdam, Germany, 2011.
38. D. B. Go, "Low-Temperature Plasma Research in the Small Scale Transport Research Lab", United States Microplasma Research Community Meeting, Jersey City, NJ, 2011.

### Conference Papers, Presentations, Posters, and Extended Abstracts

Over 150 referred and contributed conference papers, presentations, posters, and extended abstracts. Full list available upon request.

## RESEARCH SUPPORT

### Active External Grants

1. "Electrochemistry Promoted by Plasma-solvated Electrons in Non-Aqueous Solutions," W911NF-23-1-0010, ARO BAA, PI (w/ Mohan Sankaran, University of Illinois), \$515,200, 3 years, 12/05/2022-12/04/2025
2. "ECLIPSE/Collaborative Research: Unravelling the Coupled Physics of Piezoelectric and Plasma Behavior in Piezoelectric Stimulated Plasma Sources," PHY- 2206420, NSF/DOE Partnership in Basic Plasma Science and Engineering and Division of Civil, Mechanical, and Manufacturing Innovation, Co-PI (w/ Prof. Tanvir Farouk, Prof. Sourav Banjaree, University of South Carolina), \$244,359 (Notre Dame portion), 3 years, 06/15/2022-05/31/2025
3. "Effect of Radiolysis within a Confined Volume on Corrosion of Zr Alloys," PO145217, Naval Nuclear Laboratory – Fluor Marine Propulsion, Knolls Atomic Power Laboratory, Co-PI (Dr. David M. Bartels, University of Notre Dame), \$480,051, 2 years, 02/16/2022-02/15/2024
4. "Optimizing Additive Manufacturing of Thermoelectric Materials using Bayesian Optimization-Enhanced Artificial Intelligence," DE-EE0009103/0000, DOE EERE Advanced Manufacturing, Co-PI (Prof. Tengfei Luo, PI, Prof. Yanliang Zhang, Prof. Alex Dowling, University of Notre Dame, Michael D. McMurtrey, Idaho National Lab), \$2,000,000, 3 years, 09/01/2020-08/31/2023
5. "Additive Manufacturing of Reinforced Concrete Structures with Integrated Energy Efficiency," DE-EE0009070/BASE, DOE EERE ABC, Co-PI (Prof. Ashley Thrall, PI, University of Notre Dame, Eric Kreiger, Brandy Diggs-McGeer, ARL), \$500,000, 3 years, 07/01/2020-06/30/2023
6. "Process Intensification by One-Step, Plasma-Assisted Catalytic Synthesis of Liquid Chemicals from Light Hydrocarbons," DE-FE0031862, DOE NETL, Co-PI (w/ Prof. Jason Hicks, PI, Prof. William Schneider, Prof. Casey O'Brien, University of Notre Dame), \$999,954, 3 years, 03/01/2020 - 12/31/2023

7. “High-Throughput Electrokinetic Fractionation and Analysis of Extracellular (ex)RNA Nano-carriers,” 1 UG3 CA241684-01, NIH UG3/UH3 18027, Co-I (w/ Prof. Hsueh-Chia Chang, Prof. Satyajyoti Senapati, Prof. Crislyn D’Souza-Schorey, University of Notre Dame), \$927,000, 2 years, 07/30/2019-07/29/2021
  - **Phase 2 UH3:** 4UH3CA241684-03, \$1,887,990, 2 years, 08/31/2021-07/31/2023

### Active Internal Grants

1. “Collaborative ND-UC|Chile research to improve understanding of highly reactive species in plasma-liquid interfaces,” ND-UC|Chile Luksic Scholars Joint Research Award, Co-PI (w/ Prof. Felipe Veloso, UC|Chile), \$43,700, 1 year, 08/01/2022-11/15/2023.

### Completed External Grants

1. “Plasma-Induced Electrochemistry: Understanding the Behavior of Electrons at a Plasma-Liquid Interface,” W911NF-17-1-0119, ARO BAA, PI (w/ Dr. Paul Rumbach, Prof. David Bartels, University of Notre Dame, Prof. R. Mohan Sankaran, Case Western Reserve University), \$450,572, 3 years – extended by 1.5 years, 05/01/2017-10/31/2022
2. “Next Generation Capabilities for AM,” PO N000428013, Kansas City National Security Campus (NSC) – Honeywell, Co-PI (Prof. Ed Kinzel, PI, Prof. Robert Landers), \$125,604, 0.75 years, 03/23/2022-08/31/2022
3. “Energy Harvesting Approaches to Low-Temperature Plasma Generation for Field Applications,” PHY-1804091, NSF/DOE Partnership in Basic Plasma Science and Engineering, PI (w/ Prof. Seung-kyun Im, University of Notre Dame), \$274,093, 3 years, 09/01/2018-08/31/2022
4. “Ultrafast Pulsed Laser Processing in L-PBF,” PO\_N000399253, Kansas City National Security Campus (NSC) – Honeywell, Co-PI (Prof. Ed Kinzel, PI), \$48,502, 0.25 years, 06/03/2021-08/31/2021
5. “Electric Field Measurements at the Surface of a Piezoelectric Transformer for Plasma Jet Formation using the Plasma Research Facility at Sandia National Laboratory,” DE-SC0021083, DOE Opportunities in Frontier Plasma Science, PI, \$30,588, 1 year, 09/01/2020-08/31/2021
6. “Electric Field Measurements at the Surface of a Piezoelectric Transformer for Plasma Jet Formation,” 2020F0015, DOE/SNL Plasma Facility, PI (w/ Prof. Seung-kyun Im, Korea University, 4 weeks facility time, 1 year, 02/10/2020-02/10/2021
7. “Plasma-Enhanced Catalysis: A Detailed Study of Surface Interactions Between Low-Temperature Plasma and Catalytic Materials,” FA9550-18-1-0157, AFOSR BAA, PI (w/ Prof. Jason Hicks, Prof. William Schneider, University of Notre Dame), \$622,205, 3 years, 02/15/2018-02/14/2021
8. “High Temperature Gas Pressure Forming and Simulation (TMP R3-3),” LIFT (ALMMII), Co-PI (w/ Martin Philo, GKN Aerospace (PI) + 8 others from GKN Aerospace, Interlaken, American Axle, EWI, University of Michigan), \$1,671,000 (Notre Dame: \$284,000), 1.5 years, 08/07/2017-01/20/2019
  - **Extension 1:** Notre Dame: \$62,345, 11/01/2018-09/30/2019
  - **Extension 2:** Notre Dame: \$12,689, 09/30/2019-12/31/2019
  - **Extension 3:** Notre Dame: \$7,402, 01/01/2020-02/19/2020
9. “Holographic Assembly of Reconfigurable Nanoscale Plasmonic and Photonic Elements,” DARPA A2P, Co-PI (w/ Prof. Paul Bohn (PI) and 4 colleagues, University of Notre Dame), \$900,000, 3 years, 05/01/2015-04/30/2018
  - **Extension:** FA8650-15-C-7546-P00005, \$100,000, 1 year, 08/30/2018-09/30/2019
10. “Fourier Transform Infrared Spectroscopy System for the in situ Measurement of Plasma-Catalyst Interactions for Enhanced Reaction Control,” FA9550-17-1-0376, DoD DURIP, Co-PI (w/ Prof. Jason Hicks, University of Notre Dame), \$131,753, 1 year, 09/30/2017-09/29/2018
11. “CAREER: Low Temperature Microplasmas For Thermal Energy Conversion, Education, and Outreach,” PHY-1254273, NSF/DOE Partnership in Basic Plasma Science and Engineering and CBET Combustion, Fire, and Plasma Processes, PI, \$400,000, 5 years, 05/01/2013-04/31/2018

12. "An Integrated Microfluidics Platform for Rapid and Sensitive Detection Exosome RNA Analysis," HG009010-01, NIH Parent R21, Co-I (w/ Prof. Hsueh-Chia Chang, Prof. Reginald Hill, Dr. Satyajyoti Senapati, University of Notre Dame), \$414,960, 2 years, 09/14/2016-07/31/2018
13. "A Tunable Laser System for Interfacial Electron Transfer Measurements in Reactive Gas/Liquid Systems" W911NF-17-1-0206, DoD DURIP, PI (w/ Prof. David Bartels, University of Notre Dame), \$277,075, 1 year, 07/15/2017-07/14/2018
14. "Advancing Sustainable Ammonia Synthesis through Plasma-Assisted Catalysis," DE-SC0016543, Department of Energy DE-FOA-0001569, Co-PI (w/ Prof. Jason Hicks, Prof William Schnieder, University of Notre Dame), \$195,000, 1 year, 09/15/2016-09/16/2017
15. "Parametric Design of Functional Support Structures for Metal Alloy Feedstocks," America Makes, Co-PI (University of Pittsburgh lead with Notre Dame sub-contract w/ Prof. David Hoelzle (PI), Prof. Richard Billo, Prof. Steven Schmid), \$805,966, 1.5 years, 07/01/2015-01/31/2017
16. "Coupling Non-Equilibrium, High-Pressure, Micron-Scale Discharges with Surface Reactions: Exploring Synergistic Effects Between Plasma Chemistry and Chemical Catalysis," AFOSR BRI FA9550-14-1-0041, Co-PI (w/ Prof. R. Mohan Sankaran (PI), Prof. Daniel Lacks, Case Western Reserve University, Prof. Jason Hicks, University of Notre Dame), 3 years, \$1,481,558, 03/01/2014-02/28/2017
17. "Chemically Functionalized Graphene as High Performance Heat Spreader," Semiconductor Research Corporation Emerging Technologies in Materials, Processes, and Devices, Co-PI (w/ Prof. Tengfei Luo, Prof. Huili "Grace" Xing, University of Notre Dame), \$300,000, 3 years, 11/01/2014-10/31/2016
18. "Plasma Electrochemistry: A New Approach to Green Electrochemistry," ECS Toyota Young Investigator Fellowship, PI, \$50,000, 1 year, 08/01/2015-07/31/2016
19. "STIR: Probing Electrochemical Reactions at a Plasma-Liquid Interface," ARO BAA, PI (w/ Prof. R. Mohan Sankaran, Prof. Rohan Alkolkar, Case Western Reserve University, Prof. David Bartels, University of Notre Dame), \$48,107, 0.75 years, 05/01/2014-01/31/2015
20. "Pyroelectric and Ferroelectric-Driven Electrohydrodynamics for Low Input Voltage Cooling of Portable Computing," Intel Labs University Research Office, PI, \$299,097, 05/01/2013-04/31/2016
21. "Ion-Enhanced Field Emission for Control of Atmospheric Pressure Discharges," FA9550-11-1-0020, Air Force Office of Scientific Research Young Investigator Award, PI, \$360,000, 3 years, 04/01/2011-03/31/2014
22. "Electrohydrodynamic Flow Tube for Forced Air Cooling of Small-Form Factor Electronics," Intel Corporation Research Council, PI, \$225,000, 3 years, 12/9/2008-05/31/2012

### Completed Internal Grants

1. "A Framework for Monitoring Human Wellness from Infancy to Adulthood: Analyzing of Umbilical Cord Blood Progenitor Cells for Predicting Future Health Risk" Advanced Diagnostics and Therapeutics Initiative Discovery Fund, Co-PI (w/ Profs. Donny Hanjaya-Putra, Hsueh-Chia Chang, Richard Dahl (IUSM-South Bend), Laura Haneline (IUSM), Robert Munsick (IUSM)), \$79,998, 1 year, 01/01/2019-12/31/2019.
2. "Stem Cells and their Exosomes: to Model and Predict Preeclampsia" Advanced Diagnostics and Therapeutics Initiative Discovery Fund, Co-PI (w/ Prof. Donny Hanjaya-Putra), \$44,000, 1 year, 08/23/2018-08/22/2019.
3. "Plasma Science and Engineering at ND and PUC: A Workshop to Launch Interdisciplinary Collaborations" Luksic Family Collaboration Grant, PI (w/ Profs. Ryan McClarren, Sylwia Ptasinska, Eric Matlis, Sergey Leonov, and Paul Rumbach), \$15,500, 1 year, 11/28/2018-11/27/2019.
4. "Elucidating the Influence of Ferroelectric Polarization on Metal Ion Adsorption to the Surface of Nanoporous Thin Films" NDnano Seed Grant, Co-PI (w/ Prof. William Phillip, Prof. Haifeng Gao), \$50,000, 1 year, 07/01/2018-06/30/2019.

5. “The Nanotech Collaboration Initiative (NCI)” Notre Dame International Mexico City Global Center Collaboration Grant, Co-PI (w/ Prof. Hsueh-Chia Chang, David Balkin), \$20,000, 1 year, 06/20/2017-06/19/2018.
6. “Paper-SAWN Mass Spectrometry Analysis for Rapid Analysis of Pharmaceuticals in Complex Biological Matrices” Advanced Diagnostics and Therapeutics Initiative, PI (w/ Prof. Marya Lieberman, Dr. Matthew Champion), \$54,320, 1 year, 08/01/2013-07/31/2014.
7. “Rapid Separation of Vesicles by Surface Acoustic Wave-inspired Microfluidics for Early Detection and Diagnosis of Pancreatic Cancer,” Walther Cancer Foundation ENSCCII Training Project, Mentor (w/ Daniel Taller (applicant), Prof. Reginald Hill (Co-mentor), University of Notre Dame), \$30,309, 3 years, 06/01/2013-05/31/2016.
8. “AC Electrospray Ionization Mass Spectrometry: A New Technique for the Detection and Identification of Harmful Chemicals,” University of Notre Dame Faculty Scholarship Award Program, PI, \$10,000, 1 year, 01/01/2010-12/31/2010

## **PROFESSIONAL ACTIVITIES**

### **Invited Lectures and Seminars**

- Department of Aerospace Engineering, Pennsylvania State University, State College, PA (spring 2023)
- Department of Mechanical Engineering, University of Buffalo, Buffalo, NY (fall 2022)
- Department of Mechanical and Aerospace Engineering, Case Western Reserve University, Cleveland, OH (spring 2022)
- Department of Mechanical Engineering, Brigham Young University, Provo, UT (spring 2022)
- High Temperature and Plasma Laboratory, University of Minnesota, Minneapolis, MN (fall 2021) - *virtual*
- Department of Mechanical Engineering and Engineering Science, University of North Carolina at Charlotte, Charlotte, NC (fall 2021) - *virtual*
- Department of Mechanical Engineering, University of Houston, Houston, TX (fall 2021)
- Institute of Experimental and Applied Physics, Christian-Albrechts-Universität zu Kiel, Kiel, Germany (fall 2020) – *virtual*
- Engineering Physics Department, Polytechnique Montréal, Montreal, Canada (fall 2020) – *virtual*
- Online Low-Temperature Plasma Seminar (fall 2020) – *virtual*
- Department of Mechanical Engineering, Texas A&M, College Stations, TX (spring 2020) – *canceled due to the COVID-19 pandemic*
- Functional Materials Division (Nanoelectronic Materials Branch) Technical Seminar, Air Force Research Laboratory, Wright-Patterson Air Force Base, Dayton, OH (fall 2017)
- Department of Chemical Engineering, University of Pittsburgh, Pittsburgh, PA (fall 2017)
- Department of Chemistry, University of Southampton, Southampton, England (fall 2016)
- York Plasma Institute, University of York, York, England (fall 2016)
- School of Electrical Engineering and Electronics, University of Liverpool, Liverpool, England (fall 2016)
- Engineering Research Institute, Ulster University, Belfast, Northern Ireland (fall 2016)
- Department of Electrical and Computer Engineering, Western Michigan University, Kalamazoo, MI (spring 2015)
- Electromagnetic Technology Branch Seminar, U.S. Naval Research Laboratory, Washington, D.C. (fall 2014)
- Functional Materials Division (Photonic Materials Branch) Technical Seminar, Air Force Research Laboratory, Wright-Patterson Air Force Base, Dayton, OH (fall 2014)
- High Power Microwave Division Technical Seminar, Air Force Research Laboratory, Kirtland Air Force Base, Albuquerque, NM (spring 2014)

- Department of Mechanical Engineering, University of Minnesota, Minneapolis, MN (fall 2013)
- Department of Chemical and Biomolecular Engineering, University of Notre Dame, Notre Dame, IN (spring 2013)
- Department of Chemistry and Biochemistry, Ohio University, Athens, OH (fall 2012)
- Plasma Science Center, Department of Energy, Web Seminar (spring 2012)
- Department of Chemical Engineering, Case Western Reserve University, Cleveland, OH (spring 2012)
- Department of Physics, Andrews University, Berrien Springs, MI (fall 2010)
- Department of Mechanical Engineering, National University of Singapore, Singapore (spring 2010)
- Department of Mechanical and Industrial Engineering, University of Illinois-Chicago, Chicago, IL (fall 2008)

### **Journal Editorships and Society Leadership**

- Member At-Large, ASME Mechanical Engineering Department Heads Executive Committee (MEDHEC), 2022-2023 (two-year term but stepped down due to promotion to Associate Provost)
  - ASME MEDHEC Diversity, Equity, and Inclusion Award Committee
  - ASME MEDHEC Donald N. Zweip Innovation in Education Award Committee
- President, Electrostatics Society of America, 2019-2022 (two-year term extended one year due to COVID-19 pandemic)
- Associate Editor (Thermal and Mass Transport), *Frontiers in Mechanical Engineering*, 2015-2021 (stepped down after becoming Department Chair)
  - Research Topic Editor: Direct Thermal Energy Conversion and Utilization
- Associate Editor, *Plasma Sources Science and Technology*, 2020-2021 (stepped down after becoming Department Chair)
  - Editorial Board, 2017-present
- Editorial Board, *Journal of Electrostatics*, 2015-present
- Executive Council, Electrostatics Society of America, 2015-2019

### **Conference Organizing**

#### ***Leadership Positions***

- Plasma Science & Technology Division Committee, American Vacuum Society, 2022-present
- International Scientific Committee, International Symposium on Plasmas for Catalysis and Energy Materials, 2019-present
- General Chair, 2018 International Symposium on Plasma Nanoscience (iPlasmaNano-IX)
- Workshop Organizer, 2014 NASA Workshop on Thermionic Energy Conversion for Space and Earth
- General Chair, 2014 Annual Meeting of the Electrostatics Society of America
- Local Organizing Committee, 2013 Midwest Universities Analytical Chemistry Conference
- Local Organizing Committee, 2013 Notre Dame-DARPA Workshop on Optical Properties of Plasmas
- Technical Chair, 2013 Annual Meeting of the Electrostatics Society of America

#### ***Session/Symposium***

- Session Chair, American Vacuum Society, 2022
- Session Chair, Gaseous Electronics Conference, 2014, 2015, 2017, 2018, 2019, 2021
- Session Chair, International Workshop on Microplasmas, 2015
- Session Chair, Annual Meeting of the Electrostatics Society of America, 2011, 2012, 2018
- Session Chair, Intersociety Conference on Thermal and Thermomechanical Phenomena in Electrical Systems (ITherm2012), 2012
- Symposium Organizer, Central Regional Meeting of the American Chemical Society, 2011



## Miscellaneous Activities

- External Review Team, Department of Mechanical Engineering, University of Delaware (2023)
- Co-Organizer, Virtues and Vocations Engineering Education Workshop, Notre Dame, IN (2022)
- Organizing Committee, Future Leaders in Mechanical and Aerospace Engineering: Celebrating Diversity and Innovation, nationwide online seminar series (2022)
- Organizing Committee, International Online Plasma Seminar – IOPS, international online seminar series (2020-present)
- External Review Team, Graduate Program, Department of Mechanical Engineering, University of South Carolina (2020)
- Rosenbluth Outstanding Doctoral Thesis in Plasma Physics Award Committee, American Physical Society, Division of Plasma Physics (2016-2017)
- Webmaster, IEEE Components, Packaging, and Manufacturing Technology Society, Thermal Management and Thermo-Mechanical Design TC (2007-2015)
- *Proposal Reviewer*: ASEE NRL Postdoctoral Fellowship, Indiana Clinical and Translational Sciences Institute (ICTSI) CTR grant panel, NSF Combustion, Fire and Plasma Systems, NSF/DOE Partnership in Basic Plasma Science and Engineering, NSF Process Systems, Reaction Engineering, & Molecular Thermodynamics, NASA Science and Technology Research Fellowship, ARPA-E, ACS Petroleum Research Fund, Research Foundation - Flanders (Belgium), Research Corporation for Science Advancement, Sandia Plasma Research Facility, Department of Energy SBIR, NSF RII EPSCoR Track 1 (\$20M proposal)
- Direct Submission Editor for Proceedings of the National Academy of Science
- *Journal Referee*: ACS Catalysis, ACS Energy Letters, ACS Nano, Analyst, Analytical Chemistry, Applied Physics Letters, Applied Thermal Engineering, Biomicrofluidics, Chemical Communications, Chemical Engineering Journal, ChemSusChem, Contributions to Plasma Physics, Electrochemistry Communications, Encyclopedia of Plasma Technology, Energy and Buildings, Experimental Thermal and Fluid Science, Experiments in Fluids, IEEE Electron Device Letters, IEEE Transactions on Components, Packaging and Manufacturing Technology, IEEE Transactions on Plasma Science, International Journal of Heat and Mass Transfer, International Journal of Thermal Systems, Journal of Applied Physics, Journal of Electrochemical Society, Journal of Electronics Packaging, Journal of Electrostatics, Journal of Fluids Engineering, Journal of Physical Chemistry, Journal of Physics D: Applied Physics, Journal of the American Society of Mass Spectrometry, Journal of Vacuum Science and Technology A, Journal of Vacuum Science and Technology B, Journal of Visualization, Nanotechnology, Nature Communications, Optical Materials Express, Physical Review Applied, Physical Review Letters, Physical Review Research, Physics Letters A, Physics of Plasmas, Plasma Science and Technology, Plasma Sources Science and Technology, PLOS ONE, Review of Scientific Instruments, RSC Advances, Scientific Reports

## Professional Memberships

- Fellow, American Society of Mechanical Engineers (2004-present, Fellow, 2016)
- Senior Member, Institute of Electrical and Electronics Engineers (2009-present, Senior, 2022)
- Member, Electrostatics Society of America (2010-present)
- Member, American Physical Society (2015-present)
- Member, American Association for the Advancement of Science (2018-present)
- Member, American Chemical Society (2019-present)
- Member, Electrochemical Society (2015-2021)

## TEACHING & ADVISING

### Teaching and Course Development (\* indicates developed the course)

- AME 20213/21213 Introduction to Measurements and Data Analysis with laboratory (undergraduate-required)
  - 44 students (fall 2012)
  - 48 students (fall 2011)
  - 29 students (fall 2010)
  - 35 students (fall 2009)
  - 43 students (fall 2008)
- \*AME 21268 Design Tools 2 (undergraduate-required) – *part of new design curricular stem*
  - 40 students (spring 2018)
- AME 30334 Heat Transfer (undergraduate-required)
  - 168 students (spring 2017)
  - 134 students (spring 2016)
  - 129 students (spring 2015)
- AME 30362 Design Methodology (undergraduate-required)
  - 124 students (fall 2019)
- AME 34314 Differential Equations, Vibrations, and Control I (undergraduate-required)
  - 12 students (fall 2016, London Program)
- \*AME 47431 Designing Energy-Efficient Buildings (undergraduate-elective) – *co-taught with ARCH 41121 (architecture studio course)*
  - 8 students (fall 2018)
  - 8 students (spring 2016)
  - 8 students (spring 2015)
  - 4 students (spring 2014)
- \*AME 47560 Independent Undergraduate Design Projects (undergraduate-elective) – *industry-sponsored, small group projects*
  - 8 students (fall 2021) – *sponsored by Marmon Holdings, Indratech Inc.*
  - 4 students (fall 2020) – *sponsored by Marmon Holdings*
  - 5 students (spring 2020) – *sponsored by Marmon Holdings*
  - 5 students (fall 2019) – *co-mentored with Prof. Jim Schmiedeler, sponsored by Marmon Holdings*
  - 6 students (spring 2019) – *co-mentored with Prof. Jim Schmiedeler, sponsored by Marmon Holdings*
- EG35101 Innovation Projects (undergraduate-elective) – *expansion of AME47560 to enable interdisciplinary groups; serve as faculty mentor*
  - 3 students (fall 2022) – *sponsored by Marmon Holdings*
  - 7 students (spring 2022) – *sponsored by Marmon Holdings, Indratech Inc.*
- AME 54535 Energy Systems (undergraduate-elective)
  - 13 students (fall 2016, London Program)
- AME 60634 Intermediate Heat Transfer (graduate)
  - 4 students (fall 2013)
  - 12 students (spring 2013)
  - 8 students (spring 2011)
  - 8 students (spring 2009)
- \*AME 60637/70637 Ionization and Ion Transport (graduate)
  - 4 students (spring 2021)
  - 11 students (fall 2017)
  - 7 students (fall 2015)

- 3 students (spring 2014)
- 3 students (spring 2012)
- 9 students (spring 2010)

### Visiting Scientists

1. Prof. Felipe Veloso, Pontificia Universidad Catolica de Chile, 12/2022-03/2023
2. Prof. Daniel Elg, University of Southern Indiana, 05/2019-07/2019 and 06/2021-07/2021
3. Prof. Keiichiro Yoshida, Osaka Institute of Technology (Osaka, Japan), 03/2016-07/2016
4. Dr. Jenny Ho, Monash University (Melbourne, Australia), 07/2010 – 11/2010

### Postdoctoral Scholars and Research Scientists

1. Dr. Oles Dubrovski, Postdoctoral Scholar, 11/2022 – present
2. Dr. Jinyu Yang, Postdoctoral Scholar, 05/2022 – present
3. Dr. Paul Rumbach, Postdoctoral Scholar and Research Scientist, 01/2016 – 07/2019
4. Dr. Seung-Ryong Kwon (with Prof. Paul Bohn), Postdoctoral Scholar, 08/2018 – 08/2019
5. Dr. Zeinab Ramshani (with Prof. Hsueh-Chia Chang), Postdoctoral Scholar, 01/2017 – 07/2019
6. Dr. Donghoon Han (with Prof. Paul Bohn), Postdoctoral Scholar, 05/2015 – 07/2018
7. Dr. Michael Johnson, Postdoctoral Scholar, 05/2016 – 07/2016
8. Dr. Ying Wang, Postdoctoral Scholar, 01/2015 – 01/2016
9. Dr. Mridul Mandal (with Prof. Marya Lieberman), Postdoctoral Scholar, 03/2014 – 02/2015
10. Dr. Nishant Chetwani, Edison Postdoctoral Scholar, 10/2011 – 01/2012
11. Dr. Ming Tan (with Prof. Hsueh-Chia Chang), Postdoctoral Scholar, 07/2010 – 05/2011

### Graduate Students

#### **Ph.D. (current)**

1. Chiedozie Ogueri, 2026 – *anticipated*
2. Zhongyu Cheng, 2025 – *anticipated*
3. Ibukunoluwa Akintola, 2024 – *anticipated*
4. Garam Lee, (Department of Chemical and Biomolecular Engineering, Co-Advisor Prof. Casey O'Brien), 2024 – *anticipated*
5. Daniel Martin (Co-advisor Dr. David Bartels, Notre Dame Radiation Laboratory), 2023 – *anticipated*

#### **Ph.D. (graduated, first position after graduation)**

1. Jinyu Yang, (Co-advisor Prof. Seong-kyun Im, Korea University), 2022 – Postdoctoral Scholar, Department of Aerospace and Mechanical Engineering, University of Notre Dame
2. Fernando Alamos (Co-advisor Prof. Steven Schmid, University of North Carolina-Charlotte), 2022 – META, San Francisco, CA
3. Nazli Turin, 2022 – Postdoctoral Scholar, University of Southampton, England
4. Hernan Delgado de la Garza (Department of Chemical and Biomolecular Engineering), 2021 – Postdoctoral Scholar, Argonne National Laboratory
5. Francisco Herrera, 2019 – Intel Corporation, Hillsboro, OR
6. Xi Tan, 2019 – RadiaSoft LLC, Boulder, CO
7. John Haase, 2018 – Raytheon, Tucson, AZ
  - Current: Big Data Analytics Engineer, General Motors, Warren, MI
8. Xin Mu (Co-advisor Prof. Tengfei Luo, Department of Aerospace and Mechanical Engineering), 2018 – BMO Harris Bank, Chicago, IL
9. Michael Johnson, 2016 – Postdoctoral Scholar, Department of Aerospace and Mechanical Engineering, University of Notre Dame
  - Current: Research Associate, Naval Research Laboratory, Washington DC

10. Paul Rumbach, 2016 – Postdoctoral Scholar and Instructor, Department of Aerospace and Mechanical Engineering, University of Notre Dame
  - Current: Associate Teaching Professor, Department of Aerospace and Mechanical Engineering, University of Notre Dame
11. Daniel Taller (Co-advisor Prof. Hsueh-Chia Chang, Department of Chemical and Biomolecular Engineering), 2015 – Space Exploration Technologies Corporation (SpaceX), Hawthorne, CA
  - Current: Scientific Software Developer, Lawrence Livermore National Laboratory, Livermore, CA
12. Yingjie Li, 2014 – Prism Computational Sciences, Madison, WI
13. Rakshit Tirumala, 2013 – Postdoctoral Scholar, Institute Pprime, University of Poitiers, France
  - Current: Design Engineer, G.E. Aviation, Bangalore, India
14. Alejandro Guajardo-Cuéllar (Co-advisor Prof. Mihir Sen, Department of Aerospace and Mechanical Engineering), 2011 – Philips Lighting, Eindhoven, The Netherlands
  - Current: Profesor Mecánica, Tecnológico de Monterrey, Guadalajara, Mexico

**M.S.** (graduated, first position after graduation)

1. Jenny Baranker, M.S. Mechanical Engineering, 2021 – Philosophy Ph.D. student, University of Oklahoma
2. Ankur Saxena, M.S. Aerospace Engineering, 2021 – Veolia Water Technologies, Plainfield, IL
3. Katherine Isbell, M.S. Chemistry (Co-advisor Prof. Amanda Hummon, Department of Chemistry and Biochemistry), 2011 – Center for Disease Control, Atlanta, GA
4. Sajanish Balagopal, M.S. Aerospace Engineering, 2011 – Cummins Inc., Columbus, IN

**ESTEEM Advisor** (*Master's Program in Entrepreneurship, Technology, & Innovation*)

1. Flora Zieger, ESTEEM program, 2016 – Pazmany Peter Catholic University, Budapest, Hungary
2. Helga Feiszthuber, ESTEEM program, 2015 – UltraDerm Diagnostics, Budapest, Hungary
3. S. Kiel Hockett, ESTEEM program, 2011 – PTC, Minneapolis, MN, United States.

**Undergraduate Research Students**

**Notre Dame**

- Jeff Secrist, Chemical and Biomolecular Engineering (summer 2022 Slatt Fellow, fall 2022, spring 2023)
- Sean Dixon, Aerospace and Mechanical Engineering (fall 2021, spring 2022)
- Kathleen Hart, Physics (summer 2021 Nanoelectronics Undergraduate Research Fellow, fall 2021, spring 2022)
- Nick Deluca, Aerospace and Mechanical Engineering (summer 2021 Nanoelectronics Undergraduate Research Fellow, fall 2021)
- Sofiya Baran, Aerospace and Mechanical Engineering (fall 2020, spring 2021)
- Daniel Mikovits, Electrical Engineering (fall 2020, winter session 2021)
- Olivia Jaenicki, Aerospace and Mechanical Engineering (spring 2019, fall 2019, spring 2020)
- Rebecca Radomsky, Chemistry and Biochemistry (summer 2018, Nanoelectronics Undergraduate Research Fellow, fall 2018, fall 2019, spring 2020)
- Gabriel Brown, Aerospace and Mechanical Engineering (fall 2017, spring 2018, summer 2018, Slatt Fellowship, fall 2018, spring 2019, fall 2019, spring 2020)
- Se Hwan Jeon, Aerospace and Mechanical Engineering (summer 2019 Nanoelectronics Undergraduate Research Fellow, fall 2019, spring 2020)
- Federico Hita, Aerospace and Mechanical Engineering (spring 2019, summer 2019 Nanoelectronics Undergraduate Research Fellow, fall 2019)

- Christopher Hein, Aerospace and Mechanical Engineering (spring 2019)
- Maurico Segovia, Aerospace and Mechanical Engineering (summer 2017, Nanoelectronics Undergraduate Research Fellow, fall 2017, spring 2018)
- Anthony Tranquill, Aerospace and Mechanical Engineering (summer 2017, fall 2017)
- Gabriel Higuera, Aerospace and Mechanical Engineering (spring 2017)
- Michael Pettit, Aerospace and Mechanical Engineering (fall 2016, spring 2017)
- Amanda Peterson, Aerospace and Mechanical Engineering (summer 2016, fall 2016, spring 2017)
- Jean Pierre Clarke, Aerospace and Mechanical Engineering (summer 2016)
- John Kearns, Aerospace and Mechanical Engineering (summer 2014; fall 2014; spring 2015)
- Nathaniel Griggs, Physics (fall 2013; spring 2014; summer 2014, Nanoelectronics Undergraduate Research Fellow; fall 2014; spring 2015; summer 2015)
- Santiago Martinez, Aerospace and Mechanical Engineering (summer 2013, Nanoelectronics Undergraduate Research Fellow; fall 2013; spring 2014; summer 2014, Nanoelectronics Undergraduate Research Fellow; fall 2014; spring 2015)
- Clarissa Rogg, Civil & Environmental Engineering & Earth Sciences (summer 2013, Slatt Fellowship; fall 2013, spring 2014)
- Sara Dale, Chemical and Biomolecular Engineering (summer 2012, Nanoelectronics Undergraduate Research Fellow; fall 2012; spring 2013; fall 2013)
- J. Zack Woodruff, Aerospace and Mechanical Engineering (summer 2012, CRC REU; fall 2012; spring 2013)
- Matthew Goedke, Aerospace and Mechanical Engineering (fall 2011; fall 2012; spring 2013)
- Adam Talbot, Chemical and Biomolecular Engineering (summer 2012, Nanoelectronics Undergraduate Research Fellow)
- Ben Rollin, Aerospace and Mechanical Engineering (summer 2011, Nanoelectronics Undergraduate Research Fellow; fall 2011)
- Alex Calderon, Biological Sciences (summer 2011; fall 2011)
- Timothy Purcell, Aerospace and Mechanical Engineering (fall 2010; spring 2011)
- Eric Ward, Aerospace and Mechanical Engineering (summer 2010, Slatt Fellowship; fall 2010; spring 2011)
- Elizabeth Dubbs, Aerospace and Mechanical Engineering (summer 2010, Nanoelectronics Undergraduate Research Fellow; fall 2010; spring 2011)
- Amy Libardi, Aerospace and Mechanical Engineering (fall 2010)
- Conner Cox, Aerospace and Mechanical Engineering (spring 2010)
- Rachel Horning, Aerospace and Mechanical Engineering (spring 2010)
- John Glavin, Aerospace and Mechanical Engineering (fall 2009)
- Catherine Cassou, Chemistry and Biochemistry (summer 2009, Clare Booth Luce Fellow and Glynn Family Honors Program Fellow; fall 2009)
- Daniel Pohlman, Chemical and Biomolecular Engineering (summer 2009, Nanoelectronics Undergraduate Research Fellow; fall 2009)
- Thomas Furlong, Aerospace and Mechanical Engineering (fall 2008, spring 2009)
- Michael Croteau, Aerospace and Mechanical Engineering (fall 2008)

### ***External***

- Max Niebur, Johns Hopkins University, Materials Science (summer 2023 Nanoelectronics Undergraduate Research Fellow)
- Elena Parial, Purdue University, Mechanical Engineering (summer 2021 Nanoelectronics Undergraduate Research Fellow)

- Alfred Chang, Carnegie Mellon University, Computer Science (summer 2019, Nanoelectronics Undergraduate Research Fellow)
- Pitram Nayak, Indian Institute of Technology Bombay, Mechanical Engineering (summer 2018, iSURE student)
- Jingxing Gao, Zhejiang University, Optical Science and Engineering (summer 2017, iSURE student)
- Shangkun Wang, Huazhong University of Science and Technology, Thermal Energy and Power Engineering (summer 2017, iSURE student)
- Bocheng Yu, Peking University, Microelectronics (summer 2015, iSURE student)
- Manuel Pena, Siena College, Chemistry (summer 2015, Anal. Chem. REU)
- Jorge Ramirez, University of Texas, El Paso, Mechanical Engineering (summer 2015, Nanoelectronics Undergraduate Research Fellow)
- Thibault Twahirwa, Morehouse College, Chemistry/Physics (summer 2013, AFOSR YIP)
- Jordan Campbell, Morehouse College, Chemistry (summer 2013, MARC USTAR scholar)
- Maitiu O’Ciarain, University College Cork, Energy Engineering (summer 2013, Nanoelectronics Undergraduate Research Fellow)
- Zhonghui Fu, Tsinghua University, Aerospace Engineering (summer 2012, iSURE student)
- Maddy Peterek, Saint Mary’s College, Chemistry and Education (summer 2011, Kerry Long Grant for Experiential Learning awardee; fall 2011)
- Alayne Lawrence, Xavier University of Louisiana, Chemistry (summer 2010)
- Cavanaugh Welch, Morehouse College, Applied Physics (summer 2010)
- Casandra Williams, Saint Mary’s College, Chemistry (summer 2009, Clare Booth Luce Fellow)

#### *Doctoral Committee Member*

- Michael Dugas, Chemical and Biomolecular Engineering, 2022
- Feiyang Gang, Chemical and Biomolecular Engineering, 2022
- Mortaza Saeidi-Javash, Aerospace and Mechanical Engineering, 2022
- Patrick Barboun, Chemical and Biomolecular Engineering, 2021
- Trevor Demille, Aerospace and Mechanical Engineering, 2021
- Zeyu Liu, Aerospace and Mechanical Engineering, 2021
- Lydia Wermer, Aerospace and Mechanical Engineering, 2019
- Garrison Crouch, Chemical and Biomolecular Engineering, 2019
- Diya Li, Chemical and Biomolecular Engineering, 2019
- Jared Lamp, Chemistry and Biochemistry, 2018
- Eredzhep Menumerov, Aerospace and Mechanical Engineering, 2018
- Liuxian Zhao, Aerospace and Mechanical Engineering, 2018
- Jie Wang, Aerospace and Mechanical Engineering, 2018
- Zhi Wang, Aerospace and Mechanical Engineering, 2018
- Shiyang Wang, Aerospace and Mechanical Engineering, 2016
- Yunshan Wang, Chemical and Biomolecular Engineering, 2014
- Grady Crahan, Aerospace and Mechanical Engineering, 2014
- Jorge A. Ferrer-Pérez, Aerospace and Mechanical Engineering, 2012
- Nishant Chetwani, Chemical and Biomolecular Engineering, 2011
- Christopher Porter, Aerospace and Mechanical Engineering 2011
- Xinguang Cheng, Chemical and Biomolecular Engineering, 2011

## SERVICE, PROFESSIONAL DEVELOPMENT, & OUTREACH

### College and University Service

- Member, Academic Council (2023-present)
- Member, Provost's Advisory Committee (2023-present)
- Member, Institutional Risk and Compliance Committee (2023-present)
- Member, Enterprise Risk Committee (2023-present)
- Member, New Program Committee (2023-present)
- Member, Undue Foreign Influence Committee (2023-present)
- Member, *ad hoc* Committee on Promoting the Success of Students from Lower-Resource Backgrounds (2022-2023)
- Member, President's Cabinet (2022-2023)
- Member, Subcommittee on Theology Courses in Core Curriculum (2022)
- Member, Laetare Medal Recommendation Committee (2022-present)
- Member, College of Engineering Research Committee (2022-present)
- Member, Strategic Framework, Opportunities for Excellence/Distinction in Key Research and Scholarship Areas Theme Advisory Committee (2022)
- Member, New Science and Engineering Building Programming Committee (2021-2022)
- Member, Vice President for Research Search Committee (2021-2022)
- Member, Department Chairs Advisory Group (2021-2023)
- Faculty Affiliate, iNDustry Labs (2020-present)
- Member, IDEA Center Faculty Advisory Board (2020-2022)
- Member, Faculty Advisory Committee on COVID-19 Pandemic (2020-2022)
- Member, Engineering Innovation Hub Managing Director Search Committee (2020-21)
- Member, Provost's Taskforce on Academic Bullying (2019-2020)
- Member, Notre Dame Research *ad hoc* Research Misconduct Committee (2019)
- Member, College of Science Dean Review Committee (2019)
- Member, *ad hoc* Faculty Senate Resolution Committee (2018-2019)
- Member, College of Engineering Dean Search Committee (2018-2019)
- Faculty Speaker, Science & Religion Seminar, Institute for Church Life (2018)
- Faculty Speaker, Future Faculty Workshop (2018)
- Executive Committee, Harper Cancer Research Institute (2016-2019)
- Faculty Speaker, Faculty Orientation (2015)
- Faculty Speaker, Office of Research NSF CAREER workshop (2014)
- Faculty Mentor, Building Bridges program, Multicultural Student Programs and Services (2011-present)
- Member, Valedictorian Selection Committee, Provost's Office (2011)
- Faculty Advisor, American Red Cross Club (2009-2016)
- Faculty Facilitator, Center for Social Concerns Urban Plunge small group discussion leader (2009-2014)
- Faculty Session Chair, Undergraduate Scholars Conference (2010, 2011)
- Faculty Participant, Provost Discernment Dinner (2009, 2011)
- Lector, Freshman Orientation Mass (2010)
- Marshall, University of Notre Dame Commencement (2010)
- Keynote Speaker, Minority Engineering Program Honors Dinner (2009); Invited Guest (2008-2011)
- Faculty Speaker, Aerospace and Mechanical Engineering Meeting for Engineering Honors Program students (2009)
- Faculty Speaker, Aerospace and Mechanical Engineering Meeting for Undergraduates Considering Graduate School (2008, 2009)

- Faculty Speaker, Kaneb Center for Teaching and Learning Workshop Series for Graduate Students Interested in Academic Careers (2008)

### Departmental Service

- Member, *ad hoc* Committee on Strategic Planning (2018-2019)
- Chair, *ad hoc* Design Curricular Stem Committee (2017-2020)
  - *duties include helping develop and institute Design Tools 1 and 2 courses, launching and helping direct Student Fabrication Lab (2018), and planning & launching Engineering Innovation Hub (2020)*
- Member, Undergraduate Curriculum Committee, Mechanical Engineering Degree Program (2009-2012, 2016-2019)
- Member, Graduate Studies Committee (2015-2018)
- Chair, *ad hoc* General Search Committee (2015-2016)
- Member, Department Executive Committee (2013-2015)
- Member, Department Chair Search Committee (2011)
- Member, Dorini Family Endowed Chair in Energy Studies Search Committee (2009-2011)

### Professional Development

- Fellow, Atlantic Coast Conference (ACC) Academic Leaders Network (2022)
- Faculty Fellow, Collegium Annual Colloquy (2021)
- Participant, ND Lead (2019-2022) – *disrupted by COVID-19 pandemic*
- Participant, Seeking Educational Equity & Diversity (SEED) seminar (2017-2018)

### Outreach

- Board of Directors, Indiana State Museum and Historical Sites, 2022-present
- *Skype a Scientist* participant
  - St. Pius X School, S. Yarmouth, MA, 2020
- Exhibitor at St. Joseph County Public Library *Science Alive!* (South Bend, IN), 2014-present
  - hosted table on plasma science and technology at local science and technology expo targeting K-8 students with more than 2000 visitors annually
- High School Research: Coordinate Research Trinity School at Greenlawn, South Bend and University of Notre Dame (2017-2022) and mentor student research projects (2012-present)
  - Jack Schwenkler (junior), 2022
  - Anna Kelley (junior), 2020-2021 – *1<sup>st</sup> place award in Northern Indiana Regional Science and Engineering Fair, 2021*
  - Victor Karwacinski (senior), 2018-2019 – *1<sup>st</sup> place award in Northern Indiana Regional Science and Engineering Fair, 2019, progressed to Hoosier Science and Engineering Fair but did not participate*
  - Mary Sgroi and Victor Karwacinski (juniors), 2017-2018 – *1<sup>st</sup> place award in Northern Indiana Regional Science and Engineering Fair, 2018; 2<sup>nd</sup> place (11<sup>th</sup> grade) in Hoosier Science and Engineering Fair, 2018; participated in Intel International Science and Engineering Fair, 2018; Indiana winner, Stockholm Junior Water Prize, 2018*
  - Richard Allen III (junior), 2014-2016 – *2<sup>nd</sup> place award in Northern Indiana Regional Science and Engineering Fair, 2015*
  - Nick Cramer (junior), 2014-2015 – *2<sup>nd</sup> place award in Northern Indiana Regional Science and Engineering Fair, 2015*
  - John Linczer (senior), 2013-2014 – *1<sup>st</sup> place award in Northern Indiana Regional Science and Engineering Fair, 2014*



- *Co-author on M. J. Johnson, J. Linczer, D. B. Go, “Thermally induced atmospheric pressure gas discharges using pyroelectric crystals,” *Plasma Sources Science and Technology*, vol. 23, art. no. 065018, 2014*
  - Nathaniel Griggs (senior), 2012-2013 – *2<sup>nd</sup> place award in Northern Indiana Regional Science and Engineering Fair, 2013*
- Outreach Lectures
  - Guest Lecture, Indiana University-South Bend (spring 2020)
  - Student Body Lecture, Trinity School at Greenlawn, South Bend, IN (fall 2008, spring 2019)
  - Faculty Lecture, Trinity School at Greenlawn, South Bend, IN (fall 2017)
- Director, Water Impact Investigation (WII) Team outreach program for middle school students at Holy Cross Grade School (South Bend, IN) (2011-2012) and South Bend Career Academy (South Bend, IN) (2013)
  - combined presentations, bench top experiments, facility tours, and high-level chemical analysis at the Notre Dame Mass Spectrometry and Proteomics facility to introduce students to the importance of water, how it is contaminated, the tools we use to analyze it, and what they can do to improve water quality
- Lead Coordinator, MATHCOUNTS middle school mathematics competition (2009-2013)