

# LEANNE M. GILBERTSON

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## EDUCATION

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- YALE UNIVERSITY, New Haven, CT 2009 – 2014  
**Department of Chemical and Environmental Engineering**  
Doctor of Philosophy, May 2014  
Master of Philosophy, May 2012  
Master of Science, May 2012
- HAMILTON COLLEGE, Clinton, NY 2003 – 2007  
**Department of Chemistry**  
Bachelor of Arts, Magna Cum Laude, Chemistry & Education

## PROFESSIONAL POSITIONS HELD

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- Assistant Professor, Civil and Environmental Engineering, University of Pittsburgh 2015 – Present  
Secondary Appointment, Chemical and Petroleum Engineering
- Postdoctoral Associate, Chemical and Environmental Engineering, 2014 – 2015  
Center for Green Chemistry and Green Engineering, Yale University
- High School Chemistry and AP Chemistry Teacher, St. James School, MD 2009
- Teaching Fellow, George Watson's College, Edinburgh Scotland 2007 – 2008

## PUBLICATIONS

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### *Peer-Reviewed Publications*

Google Scholar **h-index = 18, citations = 1,099** (as of June 8, 2021)

**8** cover features

Underline indicates advisee author | \*Corresponding author | <sup>+</sup>Shared first authorship

41. Sleight, T. W.; Sexton, N. C.; Mpourmpakis, G.; **Gilbertson, L. M.\***; Ng, C. A.\* “A Classification Model to Identify Direct-Acting Mutagenic Polycyclic Aromatic Hydrocarbon Transformation Products.” *Under Review*
40. Stabryla, L. M.\*; Clark, R. M.; **Gilbertson, L. M.\*** “Instructional Design and Assessment of Design Thinking Course to Foster Creativity and Sustainable Engineering.” *Advances in Engineering Education, In Revision*
39. Barrios, A. C.; Cahue, Y. P.; Wang, Y.; Geiger, J. K.; Rodrigo C.; Puerari, R. C.; Matias, W. G.; Melegari, S. P.; **Gilbertson, L. M.**; Perreault, F.\* “A multispecies analysis of the relationship between oxygen content and toxicity in graphene oxide.” *Environmental Science: Nano*, 2021, 8, 1543-1559.
38. Stabryla, L. M.\*; Johnston, K. A.; Diemler, N. A.; Millstone, J. E.; Haig, S. J.; **Gilbertson, L. M.\*** “Role of bacterial motility in differential resistance mechanisms of silver nanoparticles and silver ions.” *Nature Nanotechnology*, 10.1038/s41565-021-00929-w

37. Cruces, E.; Barrios, A. C.; Cahue, Y. P.; Januszewski, B.; **Gilbertson, L. M.**; Perreault, F.\* Similar toxicity mechanisms between graphene oxide and oxidized multi-walled carbon nanotubes in *Microcystis aeruginosa*, *Chemosphere*, 2021, 265, 1291237.
36. Albalghiti, E.; Stabryla, L. M.; **Gilbertson, L. M.**; Zimmerman, J. B.\* “Towards resolution of antibacterial mechanisms in metal and metal oxide nanomaterials: a meta-analysis of the influence of study design on mechanistic conclusions.” *Environmental Science: Nano*, 2021, 8, 37-66.
35. Aquino de Carvalho, N.; Wang, Y.; Morales-Soto, N.; Waldeck, D.; Bibby, K.; Doudrick, K.; **Gilbertson, L. M.**\* “Using Carbon-Doping to Identify Photocatalytic Properties of Graphitic Carbon Nitride that Govern Antibacterial Efficacy.” *Environmental Science and Technology: Water*, 2021, 1(2), 269-280. **Cover Feature**
34. Wang, Y.<sup>±</sup>; Basdogan, Y.<sup>±</sup>; Zhang, T.; Lankone, R.S.; Wallace, A. N.; Fairbrother, D. H.; Keith, J. A.; **Gilbertson, L.M.**\* “Unveiling the Synergistic Role of Oxygen Functional Groups in the Graphene-Mediated Oxidation of Glutathione.” *ACS Applied Materials and Interfaces*, 2020, 12(41) 45753-45762.
33. Sleight, T.; Khanna, V.; **Gilbertson, L. M.**\*; Ng, C\*. “Network Analysis for Prioritizing Biodegradation Metabolites of Polycyclic Aromatic Hydrocarbons.” *Environmental Science and Technology*, 2020, 54(17), 10735–10744.
32. Hofmann, T.\*; Lowry, G. V.\*; Ghoshal, S; Tufenkji, N.; Brambilla, D.; Dutcher, J. R.; **Gilbertson, L. M.**; Giraldo, J. P.; Kinsella, J. M.; Landry, M. P.; Lovell, W.; Naccache, R.; Paret, M. L.; Pedersen, J. A.; Unrine, J. M.; White, J. C.; Wilkinson, K. J. “Technology readiness and overcoming barriers to sustainably implement nanotechnology-enabled plant agriculture.” *Nature Food*, 2020, 1, 416-425.
31. **Gilbertson, L. M.**\*; Pourzahedi, L.; Laughton, S.; Gao, X; Zimmerman, J. B.; Theis, T. L.; Westerhoff, P.; Lowry, G. V. “Guiding the Design Space: Advancing Sustainable Crop Production Using Nanotechnology.” *Nature Nanotechnology*, 2020, 15, 801–810, **Cover Feature**
30. Clark, R.\*; Stabryla, L. M.; **Gilbertson, L. M.**\* “Student Perspectives and Reflections on the Use of Design Thinking”, *International Journal of Sustainability in Higher Education*, 2020, 21(3), 593-611.
29. Pandorf, M.; Pourzahedi, L.; **Gilbertson, L. M.**; Lowry, G. V.; Herckes, P.; Westerhoff, P.\* “Graphite Nanoparticle Addition to Fertilizers Reduces Nitrate Leaching in Growth of Lettuce (*Lactuca sativa*).” *Environmental Science: Nano*, 2020, 7, 127–138.
28. Barrios, A. C.; Wang, Y.; **Gilbertson, L. M.**; Perreault, F.\* “Structure-property-toxicity relationships of graphene oxide: role of surface chemistry on the mechanisms of interactions with bacteria.” *Environmental Science and Technology*, 2019, 53(24), 14679-14687.
27. Wang, Y.; Aquino de Carvalho, N.; Tan, S.; **Gilbertson, L. M.**\* “Leveraging Electrochemistry to Uncover the Role of Nitrogen in the Biological Reactivity of Nitrogen-Doped Graphene.” *Environmental Science: Nano*, 2019, 6, 3525. **Cover Feature, Hot Article (selected as one of the top 10% of papers published)**
26. Johnston, K. A.; Stabryla, L. M.; **Gilbertson, L. M.**; Millstone, J. E.\* “Connecting Concepts of Coinage Metal Stability Across Length Scales.” *Environmental Science: Nano*, 2019, 6, 2674-2696 **Featured in the Themed Issue: Best Papers 2019**
25. Lowry, G. V.\*; Avellan, A.; **Gilbertson, L. M.** “Opportunities and Challenges for Nanotechnology in the Agri-Tech Revolution.” *Nature Nanotechnology*. 2019, 14, 517-522.

24. Lankone, R. S.; Challis, K.; Pourzahedi, L.; Durkin, D. P.; Bi, Y.; Wang, Y.; Garland, M.; Brown, F.; Hristovski, K.; Tanguay, R.; Westerhoff, P.; Lowry, G.; **Gilbertson, L. M.**; Ranville, J. D.; Fairbrother, H.\* “Copper release and transformation following natural weathering of nano-enabled pressure-treated lumber.” *Science of the Total Environment*, 2019, 668, 234-244.
23. Wang, Y.; Tavakoli, S.; Vidic, R.; Khanna, V.; **Gilbertson, L. M.**\* “Life Cycle Assessment of a Produced Water and Abandoned Mine Drainage Co-Treatment Process to Advance Water Quality Management in Pennsylvania” *Environmental Science and Technology*, 2018, 52(23), 13995-14005.
22. Smith, A. and **Gilbertson, L. M.**\* “Rational Ligand Design to Improve Agrochemical Delivery Efficiency and Advance Agriculture Sustainability.” *ACS Sustainable Chemistry and Engineering*, 2018, 6 (11), 13599-13610.
21. Stabryla, L.; Johnston, K.; Millstone, J. E.; **Gilbertson, L. M.**\* “It’s Not All About the Ion!: Support for Particle-Specific Contributions to AgNP Antimicrobial Activity.” *Environmental Science: Nano*, 2018, 5, 2047-2068. **Cover Feature**
20. Pourzahedi, L.; Pandorf, M.; Ravikumar, D., Zimmerman, J. B.; Seager, T. P.; Theis, T. L.; Westerhoff, P.; **Gilbertson, L. M.**\*, Lowry, G. V. “Life cycle considerations of nano-enabled agrochemicals: Are today’s tools up to the task?” *Environmental Science: Nano*, 2018, 5, 1057-1069. **Cover Feature**
19. Falinski, M. M.; Plata, D. L.; Chopra, S. S.; Theis, T. L.; **Gilbertson, L. M.**; Zimmerman, J. B.\* “Navigating nanomaterial space for performance, hazard, and cost: Approaching more responsible nanomaterial selection and design.” *Nature Nanotechnology*, 2018, 13, 708-714.
18. Urso, J. H. and **Gilbertson, L. M.**\* “Atom Conversion Efficiency: A New Sustainability Metric Applied to Nitrogen and Phosphorus Use in Agriculture.” *ACS Sustainable Chemistry and Engineering*. 2018, 6(4), 4453-4463. **Cover Feature**
17. Johnston, K. A.; Stabryla, L. M.; Smith, A. M.; Gan, X. Y.; **Gilbertson, L. M.**\*; Millstone, J. E.\* “Impacts of Broth Chemistry on Silver Ion Release, Surface Chemistry Composition, and Bacterial Cytotoxicity of Silver Nanoparticles” *Environmental Science: Nano*, 2018, 5, 304-312.
16. Yin, J.; Wang, Y.; **Gilbertson, L. M.**\* “Opportunities to Advance Sustainable Design of Nano-Enabled Agriculture Identified Through a Literature Review.” *Environmental Science: Nano*, 2017, 5, 11-26.
15. Lankone, R. S.; Challis, K.; Bi, Y.; Hanigan, D.; Reed, R. B.; Zaikova, T.; Hutchison, J. E.; Westerhoff, P.; Ranville, J.; Fairbrother, H.; **Gilbertson, L. M.**\* “Methodology for Quantifying Engineered Nanomaterial Release from Diverse Matrices in Outdoor Weathering Conditions to Inform Life Cycle Assessment.” *Environmental Science: Nano*, 2017, 4, 1784-1797. **Cover Feature**
14. Gallagher, M. J.; Allen, C; Buchman, J. T.; Qiu, T. A.; Clement, P. L.; Krause, M. O. P.; **Gilbertson, L. M.**\* “Research highlights: Applications of life-cycle assessment as a tool for characterizing environmental impacts of engineered nanomaterials.” *Environmental Science: Nano*, 2017, 4(2), 276-281.
13. Wang, Y.; **Gilbertson, L. M.**\* “Informing Rational Design of Graphene Oxide through Surface Chemistry Manipulations: Properties Governing Electrochemical and Biological Activities.” *Green Chemistry*, 2017, 19, 2826-2838. **Special Issue: 2017 Emerging Investigators**
12. **Gilbertson, L. M.**\* and Ng, C. A.\* “Evaluating the Use of Alternatives Assessment to Compare Nanomaterial and Bulk Chemical Alternatives to Brominated Flame Retardants.” *ACS Sustainable Chemistry and Engineering*, 2016, 4(11), 6019-6030.

11. **Gilbertson, L. M.\***; Albalghiti, E. M.; Fishman, Z.; Perreault, F.; Corredor, C.; Posner, J. D.; Elimelech, M.; Pfefferle, L. D.; Zimmerman, J. B. “Shape-Dependent Properties of Nano-Cupric Oxide: Surface Reactivity and Antimicrobial Activity.” *Environmental Science and Technology*, 2016, 50(7), 3975-3984.
10. **Gilbertson, L. M.**; Melnikov, F.; Wehmas, L.; Anastas, P. T.; Tanguay R.; Zimmerman, J. B.\* “Toward Safer Multi-Walled Carbon Nanotube Design: Establishing a Statistical Model that Relates Surface Charge and Embryonic Zebrafish Mortality.” *Nanotoxicology*, 2016, 10(1), 10-19.
9. **Gilbertson, L. M.\***; Wender, B. A.; Zimmerman, J. B.; Eckelman, M. J. “Coordinating Modeling and Experimental Research of Engineered Nanomaterials to Improve Life Cycle Assessment Studies.” *Invited Submission to Environmental Science: Nano*, 2015, 2, 669-682.
8. Hicks, A.<sup>†\*</sup>; **Gilbertson, L. M.<sup>†</sup>**; Jamila S. Yamani; Zimmerman, J. B.; Theis, T. “Life Cycle Payback Estimates of Nano-Silver Enabled Textiles Under Different Silver Loading, Release, and Laundering Scenarios Informed by Literature Review.” *Environmental Science and Technology*, 2015, 49(13), 7529-7542.
7. Azoz, S.; **Gilbertson, L. M.**; Hashmi, S. M.; Han, P.; Stervinsky, G. E.; Kanaan, S. A.; Zimmerman, J. B.; Pfefferle, L. D.\* “Enhanced Dispersion and Electronic Performance of Single-Walled Carbon Nanotube Thin Films without Surfactant: A Comprehensive Study of Various Treatment Processes.” *Carbon*, 2015, 93, 1008-1020.
6. **Gilbertson, L. M.**; Zimmerman, J. B.; Plata, D. L.; Hutchison, J. E.\*; Anastas, P. T.\* “Designing Nanomaterials to Maximize Performance and Minimize Implications Guided by the Principles of Green Chemistry.” *Chemical Society Review*, 2015, 44, 5758-5777. **Cover Feature**
5. Azoz, S.; Exarhos, A. L.; Marquez, A.; **Gilbertson, L. M.**; Nejati, S.; Cha, J. J.; Zimmerman, J. B.; Kikkawa, J. M.; Pfefferle, L. D.\* “Highly Conductive Single-Walled Carbon Nanotube Thin Films Preparation by Direct Alignment on Substrates from Water Dispersions.” *Langmuir*, 2015, 31(3), 1155-1163.
4. **Gilbertson, L. M.**; Busnaina, A. A.; Isaacs, J.; Zimmerman, J. B.; Eckelman, M. J.\* “Life Cycle Impacts and Benefits of a Carbon Nanotube-Enabled Chemical Gas Sensor.” *Environmental Science and Technology*, 2014, 48(19), 11360-11368.
3. **Gilbertson, L. M.**; Goodwin, D. G.; Taylor, A. D.; Pfefferle, L. D.; Zimmerman, J. B.\* “Towards Tailored Functional Design of Multi-Walled Carbon Nanotubes (MWNTs): Electrochemical and Antimicrobial Activity Enhancement via Oxidation and Selective Reduction.” *Environmental Science and Technology*, 2014, 48(10), 5938-5945.
2. **Pasquini, [Gilbertson] L. M.**; Sekol, R. C.; Taylor, A. D.; Pfefferle, L. D.; Zimmerman, J. B.\* “Realizing Comparable Oxidative and Cytotoxic Potential of Single- and Multiwalled Carbon Nanotubes through Annealing.” *Environmental Science and Technology*, 2013, 47(15), 8775-8783.
1. **Pasquini, [Gilbertson] L. M.**; Hashmi, S. M.; Sommer, T. J.; Elimelech, M.; Zimmerman, J. B.\* “Impact of Surface Functionalization on Bacterial Cytotoxicity of Single-Walled Carbon Nanotubes.” *Environmental Science and Technology*, 2012, 46(11), 6297-6305.

### ***Manuscripts in preparation***

Underline indicates advisee author | \*Corresponding author | <sup>†</sup>Shared first authorship

1. Aquino de Carvalho, N. and **Gilbertson, L. M.\*** “Comparative Life Cycle Assessment of Graphitic Carbon Nitride Synthesis Routes”, *In Preparation*

2. Stabryla, L. M.; Moncure, P.; Millstone, J. E.; **Gilbertson, L. M.\*** “Silver Nanoparticle Shape as a Design Handle to Control Antimicrobial Outcomes”, *In Preparation*
3. Dunn, P. J. and **Gilbertson, L. M.\*** “Geo-physicochemical Variables Influencing Nutrient Use Efficiency in Corn Growth: Informing Interventions to Advance Sustainable Crop Production.” *In Preparation*

### ***Non-Refereed Publications***

#### Peer-reviewed Conference Proceedings

2. Clark, R.; Stabryla, L. M.; **Gilbertson, L. M.** “Use of Active Learning and the Design Thinking Process to Drive Creative Sustainable Design Solutions.” 2018 ASEE Annual Conference and Exposition, Salt Lake City, UT. <https://peer.asee.org/31186>
1. Wang, Y.; Zimmerman, J. B.; **Gilbertson, L. M.** “Effect of Oxygen Functionalization on the Electrochemical and Antimicrobial Activity of Carbon Nanomaterials: Isolating the role of Surface Chemistry.” 2016 Carbon Conference, Penn State University.

### **PRESENTATIONS**

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#### Invited Presentations

26. National Nanotechnology Initiative (NNI) nanoEHS webinar panelist: *What we know about nanoEHS*, June 8, 2021
25. University of Notre Dame, Department of Civil and Environmental Engineering and Earth Sciences, April 26, 2021
24. University of Kentucky, Department of Plant and Soil Sciences, February 26, 2021
23. Plumbing Manufacturers International Conference, Invited Speaker, Virtual Conference, November 10-12, 2020
22. International Conference on Phosphates 2020, Keynote speaker, Virtual Conference, October 12-17, 2020
21. 15<sup>th</sup> International Conference on the Environmental Effects of Nanoparticles and Nanomaterials, Keynote speaker, Montreal, Canada August 23-26, 2020 (invited)
20. Safe and Sustainable Smart Nanomaterials workshop jointly organized by the European Commission’s Joint Research Centre (JRC) and the Directorate-General for Research and Innovation (RTD), Ispra, Varese (Italy) March 24-25, 2020 (invited)
19. National Academy of Sciences US-UK Science Forum on Sustainable Agriculture, Keynote speaker, Washington, DC March 5-6, 2020
18. Washington University in Saint Louis, Department of Energy, Chemical and Environmental Engineering, September 20, 2019.
17. American Chemical Society Fall 2019 Meeting, Invited Speaker in the session: Showcasing Emerging Investigators & Future Perspectives: A Symposium by the RSC Environmental Science Journals, San Diego, CA, August 25-29, 2019.
16. American Chemical Society Colloids and Surface Sciences Symposium, Keynote speaker in the session: Environmental Systems and Sustainability Session, Atlanta Georgia, June 16-19, 2019.
15. Environmental Nanotechnology Gordon Research Conference, Speaker in the Sustainable Nano: Green Design and Life Cycle Assessment Session, Newry, ME, June 2-7, 2019.

14. Tennessee Tech University, Department of Chemical Engineering, April 23, 2019.
13. American Chemical Society Spring 2019 Meeting, Invited Speaker for the Nanotechnology at the Water-Agriculture-Energy Nexus, Orlando, FL, March 31-April 4, 2019.
12. Pittsburgh Water Collaboratory, Faculty Lunch Series, February 4, 2019.
11. Quantifying Exposure to Engineered Nanomaterials (QEEN) from Manufactured Products Workshop II, Speaker in the Exposure to Nanomaterials in Agroecosystems and Agriculture Production Session, U.S. Department of Labor, Washington DC, October 9-10, 2018.
10. Nanoscale Science and Engineering for Agriculture and Food Systems Gordon Research Conference, Speaker in the Emerging Investigator Session, South Hadley, MA, June 3-8, 2018.
9. University of Buffalo, Department of Civil and Environmental Engineering, December 8, 2017.
8. Northwestern University, Department of Civil and Environmental Engineering, October 27, 2017.
7. 3M, Science and Engineering Day, June 6, 2017.
6. Carnegie Mellon University, Department of Civil and Environmental Engineering, March 24, 2017.
5. Arizona State University, School of Sustainable Engineering and the Built Environment, February 21, 2016.
4. St. Francis University, Environmental Engineering Department, December 2, 2016.
3. Indiana University of Pennsylvania, Chemistry Department Seminar, October 31, 2016.
2. University of Pittsburgh Science 2016, Late-Breaking Technologies and Methods session, October 20, 2016.
1. Hamilton College, Chemistry Department Seminar, April 8, 2016.

#### Conference Presentations

*47 since at University of Pittsburgh (35 student presentations, 3 received award recognition)*

65. *Combatting Antimicrobial Resistance through Rationally Designed Engineered Nanomaterials*. ASM Microbe Online, June-August, 2020 (**Student E-Poster, Lisa Stabryla**)
64. *Identifying the Role of Different Oxygen Functional Groups in the Graphene-Mediated Antioxidant Glutathione Oxidation Reaction*. 8<sup>th</sup> Sustainable Nanotechnology Organization Conference, San Diego, CA. November 7-9, 2019. (**Student Oral, Yan Wang**)
63. *Linking Electrochemical Properties and Biological Reactivities of N-Doped Graphene to Inform Rational Design*. 8<sup>th</sup> Sustainable Nanotechnology Organization Conference, San Diego, CA. November 7-9, 2019. (**Student Poster, Yan Wang**) \***First prize in student poster competition**
62. *Leveraging Electrochemistry to Uncover the Role of Nitrogen in the Biological Reactivity of Nitrogen-Doped Graphene*. SETAC North America 40<sup>th</sup> Annual Meeting, Toronto, Ontario, Canada. November 3-7, 2019. (**Student Oral, Yan Wang**)
61. *Combatting Antimicrobial Resistance through Rationally Designed Engineered Nanomaterials*. National Defense Science and Engineering Graduate Fellowship Conference, San Diego, CA, August 5-9, 2019 (**Student Poster, Lisa Stabryla**)
60. *Leveraging Electrochemistry to Uncover the Role of Nitrogen in the Biological Reactivity of Nitrogen-Doped Graphene*. Carbon 2019, Lexington, KY. July 14-19, 2019. (**Student Oral, Yan Wang**)

59. *Not all Oxygen is Equal: Identifying the Role of Different Oxygen Functional Groups in the Graphene-Mediated Glutathione Oxidation Reaction*. Carbon 2019, Lexington, KY. July 14-19, 2019. **(Oral, Gilbertson)**
58. *The Role of Nitrogen in the Rational Design of Carbon Nitride for Antibacterial Applications*. Environmental Nanotechnology Gordon Research Seminar and Conference, Newry, ME. June 2-7, 2019 **(Student Poster, Nathália Aquino de Carvalho)**.
57. *Combating Antimicrobial Resistance through Rationally Designed Engineered Nanomaterials*. Environmental Nanotechnology Gordon Research Seminar and Conference, Newry, ME, June 1-7, 2019 **(Student Poster, Lisa Stabryla)**
56. *Linking Electrochemical Properties and Biological Reactivities of N-Doped Graphene to Inform Rational Design*. Environmental Nanotechnology Gordon Research Seminar and Conference, Newry, ME. June 1-7, 2019. **(Student Poster, Yan Wang)**
55. *Leveraging Nanomaterial Design for Next Generation Antimicrobials*. Environmental Nanotechnology Gordon Research Seminar, Newry, ME, June 1-7, 2019 **(Student Oral, Lisa Stabryla)**
54. *Tuning Carbon Nanomaterial Interactions at the Bio-interface: From Mechanism to Sustainable Design*. AEESP Conference, Phoenix, AZ. May 14-16, 2019 **(Oral, Gilbertson)**
53. *Teaching Sustainable Engineering and Driving Creative Sustainable Solutions Using a Design Thinking Approach*. AEESP Conference, Phoenix, AZ. May 14-16, 2019 **(Student Oral, Lisa Stabryla)**
52. *Networks Analysis to Inform Predictions of Polycyclic Aromatic Hydrocarbon Degradation in the Environment*. AEESP Conference, Phoenix, AZ. May 14-16, 2019 **(Student Oral, Trevor Sleight)**
51. *Combating Antimicrobial Resistance through Rationally Designed Engineered Nanomaterials*. AEESP Conference, Phoenix, AZ. May 14-16, 2019 **(Student Poster, Lisa Stabryla)**
50. *The Role of Nitrogen in the Rational Design of Carbon Nitride for Antibacterial Applications*. Engineering Sustainability Conference, Pittsburgh, PA. April 7-9, 2019. **(Student Poster, Nathalia Aquino de Carvalho)**
49. *Designing new antimicrobial agents*. Department of Defense (DoD) Science, Technology, and Innovation Exchange (STI<sup>X</sup>), US Institute of Peace, Washington DC, December 10-11, 2018. **(Student Oral, Lisa Stabryla)**
48. *A Systems Approach to Design of Nano-Enabled Solutions to Improve Nutrient Use Efficiency*. Sustainable Nanotechnology Organization Conference, Washington, DC. November 8-10, 2018. **(Oral, Gilbertson)**
47. *Designing with the System in Mind: Life Cycle Assessment of Nano-Enabled Agrochemicals*. 2018 AIChE Annual Meeting, Pittsburgh, PA. Oct 28-Nov 2, 2018. **(Oral, Gilbertson)**
46. *Unraveling the role of nitrogen in the biological activity of nitrogen-doped graphene*. 2018 AIChE Annual Meeting, Pittsburgh, PA. Oct 28-Nov 2, 2018. **(Student Oral Presentation, Yan Wang)**
45. *Life cycle assessment of co-treatment process of produced water and abandoned mine drainage*. PA-AWWA SW Districts and Western Section WWOAP Joint Meeting, Pittsburgh, PA. Oct 19, 2018. **(Student Oral, Yan Wang)**

44. *Quantifying nanomaterial release of nanocomposites following natural weathering*. 2<sup>nd</sup> Quantifying Exposure to Engineered Nanomaterials from Manufactured Products Workshop, Washington, DC. October 9-10, 2018. (**Poster, Gilbertson**)
43. *Teaching sustainable engineering using a design thinking approach*. The Association for the Advancement of Sustainability in Higher Education (AASHE) Conference & Expo, Pittsburgh, PA, Oct 2-5, 2018. (**Joint Oral Presentation, Gilbertson and Lisa Stabryla**)
42. *Use of active learning and the design thinking process to drive creative sustainable design solutions and promote inclusive classroom environments*. The Association for the Advancement of Sustainability in Higher Education (AASHE) Conference & Expo, Pittsburgh, PA, Oct 2-5, 2018. (**Student Poster, Lisa Stabryla**)
41. *Revealing causative mechanisms of electrochemical and biological activities of graphene via heteroatom functionalization*. 256<sup>th</sup> ACS National Meeting, Boston, MA. Aug 19-23, 2018 (**Student Oral, Yan Wang**)
40. *Leveraging nanomaterial design for next generation antimicrobials*. Microbial Stress Response Gordon Research Seminar (GRS) and Conference (GRC), South Hadley, MA, July 14-20, 2018. (**Student Poster, Lisa Stabryla**)
39. *Atom Conversion Efficiency (ACE): Assessing Fertilizer Use Efficiency From Synthesis to Farm Gate*. 2018 Nanoscale Science and Engineering for Agriculture and Food Systems (GRS and GRC), South Hadley, MA, June 3–8, 2018 (**Student Poster, Josh Urso**)
38. *Leveraging nanomaterial design for next generation antimicrobials*. Graduate Student Research Day (GSRD), University of Pittsburgh, Pittsburgh, PA, April 6, 2018. (**Student Oral, Lisa Stabryla**)
37. *Use of Active Learning and the Design Thinking Process to Drive Creative Sustainable Design Solutions*. Assessment and Teaching Conference, Pittsburgh, PA, January 26, 2018. (**Student Poster, Lisa Stabryla**)
36. *Sustainable design of carbon nanomaterials: decoupling the role of material structure and surface chemistry on electrochemical and biological activities*. 9th Annual Sustainability Conference hosted by ASCE, Pittsburgh, PA. Nov 16, 2017. (**Student Poster, Yan Wang**) \***Third Prize Best Poster Award in Student Poster Competition**
35. *Informing rational design of graphene oxide through surface chemistry manipulations: properties governing electrochemical and biological activities* American Carbon Society Graphene Workshop, Cleveland, Ohio Nov 14–15, 2017. (**Student Oral, Yan Wang**).
34. *Sustainable design of carbon nanomaterials: decoupling the role of material structure and surface chemistry on electrochemical and biological activities* AIChE Annual Meeting, Minneapolis, MN Oct 29–Nov 2, 2017. (**Student Oral, Yan Wang**) \***Second Runner-up Prize of the Carbon Nanomaterials Graduate Student Award**
33. *Coupling Material and Biological Systems to Inform Design of Nano-enabled Antimicrobials*. 27th Annual Society of Environmental Journalists (SEJ) Conference, Pittsburgh, PA, Oct 4-8, 2017. (**Student Poster, Lisa Stabryla**)
32. *Design for Sustainable (nano)Materials*. AEESP Research and Education Conference, University of Michigan, June 20–22, 2017. (**Poster, Gilbertson**)
31. *Leveraging Nanomaterial Design for Next Generation Antimicrobials*. Environmental Nanotechnology Gordon Research Conference (GRC), Stowe, Vermont, June 18-23, 2017 (**Student Poster, Lisa Stabryla**).



30. *Leveraging Nanomaterial Design for Next Generation Antimicrobials*. 21st Annual ACS Green Chemistry & Engineering Conference, Reston, Virginia, June 13-15, 2017. **(Student Poster, Lisa Stabryla)**
29. *Leveraging Nanotechnology to Advance Agriculture Sustainability: Life Cycle Considerations and Recommendations*. Engineering Sustainability Conference, Pittsburgh, PA, April 10–11, 2017. **(Oral, Gilbertson)**
28. *Sustainable Design of Carbon Nanomaterials: Decoupling the Role of Material Structure and Surface Chemistry on Electrochemical and Biological Activities*. Engineering Sustainability Conference, Pittsburgh, PA, April 10–11, 2017. **(Student Poster, Yan Wang)**
27. *Systems-Level Evaluation of Nano-Enabled Applications for Agriculture and Food Systems: Opportunities to Inform Sustainable Design*. Engineering Sustainability Conference, Pittsburgh, PA, April 10-11, 2017. **(Student Poster, Joy Yin)**
26. *Coupling Material and Biological Systems to Inform Design of Nano-enabled Antimicrobials*. Engineering Sustainability Conference, Pittsburgh, PA, April 10-11, 2017. **(Student Poster, Lisa Stabryla)**
25. *Informing Rational Design of Graphene Oxide through Surface Chemistry Manipulations: Properties Governing Electrochemical and Biological Activities*. Graduate Student Research Day, Department of Civil and Environmental Engineering, University of Pittsburgh, April 7<sup>th</sup>, 2017. **(Student Oral, Yan Wang)**
24. *Can We Engineer a Solution to the Antimicrobial Resistance Challenge Using Silver Nanoparticles?* Graduate Student Research Day, Department of Civil and Environmental Engineering, University of Pittsburgh, Pittsburgh, PA, April 7, 2017. **(Student Oral, Lisa Stabryla)**
23. *Toward Rational Design of Carbon Nanomaterials: Decoupling the Role of Material Structure and Surface Chemistry on Electrochemical and Antimicrobial Activity*. Carbon Conference, State College, PA, July 10–15, 2016. **(Student Poster, Yan Wang)**
22. *Effect of Oxygen Functionalization on the Electrochemical and Antimicrobial Activity of Carbon Nanomaterials: Isolating the role of Surface Chemistry*. Carbon Conference, Penn State University, July 10–15, 2016. **(Oral, Gilbertson)**
21. *Evaluating a Potential Win-Win for Water Quality Management in Pennsylvania*. Gordon Research Conference, Environmental Sciences: Water, Holderness, NH, June 26–July 1, 2016. **(Poster, Gilbertson)**
20. *Systems-Level Evaluation of Nano-Enabled Applications in the Agriculture Sector*. Green Chemistry and Engineering Conference, Portland, OR, June 14–16, 2016. **(Student Poster, Joy Yin)**
19. *Evaluating Trade-Offs to Maximize the Net Benefit of Emerging (nano)Technologies*. Green Chemistry and Engineering Conference, Portland, OR, June 14–16, 2016. **(Oral, Gilbertson)**
18. *Engineered Path Towards Innovative and Sustainable Nanotechnology Through the Lens of Manufacturing*. Sustainable Nanotechnology Organization Conference, Portland, OR, November 8–10, 2015. **(Oral, Gilbertson)**
17. *Sustainability by Design: Development of an Engineered Nanomaterials Selection Framework that Includes Property, Function and Hazard Criteria*. Gordon Research Conference in Environmental Nanotechnology, Mount Snow, West Dover, VT, June 21–26, 2015. **(Poster, Gilbertson)**

16. *Development of a Pre-Screening Tool to Quantify Impact and Benefit Tradeoffs of Emerging Technologies*. Association of Environmental Engineering and Science Professors (AEESP) Conference, Yale University, New Haven, CT, June 13–16, 2015. **(Oral, Gilbertson)**
15. *Towards the Development of a Model that Informs Safer Carbon Nanotube Design: Using Zebrafish Mortality to Evaluate Carbon Nanotube Ecotoxicity Potential*. Sustainable Nanotechnology Organization Conference, Boston, MA, November 2–4, 2014. **(Oral, Gilbertson)**
14. *Life Cycle Impacts and Benefits of a Carbon Nanotube-Enabled Chemical Gas Sensor*. Sustainable Nanotechnology Organization Conference, Boston, MA, November 2–4, 2014. **(Oral, Gilbertson)**
13. *Towards Tailored Functional Design of Multi-Walled Carbon Nanotubes (MWNTs): Electrochemical and Antimicrobial Activity Enhancement via Oxidation and Selective Reduction*. American Chemical Society 248<sup>th</sup> National Meeting, San Francisco, CA, August 10–14, 2014. **(Oral, Gilbertson)**
12. *Impact of Oxygen Functional Groups on Multi-Walled Carbon Nanotube (MWNT) Reactivity: Potential Environmental Implications*. Gordon Research Conference in Environmental Sciences: Water, Holderness, NH, June 22–27, 2014. **(Poster, Gilbertson)**
11. *Impact of Annealing Treatment on the Electrochemical Activity of Multi-Walled Carbon Nanotubes: Implications for Bacterial Cytotoxicity*. Gordon Research Conference in Environmental Nanotechnology, Stowe, VT, June 2–7, 2013. **(Poster, Pasquini [Gilbertson])**
10. *Physicochemical Properties that Govern Multi-Walled Carbon Nanotube (MWNT) Bacterial Cytotoxicity*. Robert M. Langer Graduate Student Symposium, Yale University, December 7, 2012. **(Oral, Pasquini [Gilbertson])**
8. *A New Perspective on Carbon Nanotube Bacterial Cytotoxicity: MWNTs Exhibit Equivalent Loss of Cell Viability as SWNTs*. Inaugural Sustainable Nanotechnology Organization Conference, Arlington, VA, November 4–6, 2012. **(Poster, Pasquini [Gilbertson])**
9. *Towards Green Design of Single-Walled Carbon Nanotubes: Decreased Cytotoxicity via Addition of Surface Functional Groups*. Robert M. Langer Graduate Student Symposium, Yale University, December 9, 2011. **(Oral, Pasquini [Gilbertson])**
7. *Towards Green Design of Single-Walled Carbon Nanotubes: Decreased Cytotoxicity via Addition of Surface Functional Groups*. Environmental Protection Agency STAR Graduate Fellowship Conference, Washington, DC, September 19–20, 2011. **(Poster, Pasquini [Gilbertson])**
6. *Green Design of Single-Walled Carbon Nanotubes: Decreased Bacterial Cytotoxicity via Addition of Surface Functional Groups*. Gordon Research Conference in Environmental Nanotechnology, Waterville Valley, NH, May 29–June 3, 2011. **(Poster, Pasquini [Gilbertson])**
5. *Green Design of Single-Walled Carbon Nanotubes: Decreased Bacterial Cytotoxicity via Addition of Surface Functional Groups*. American Chemical Society 15<sup>th</sup> Annual Green Chemistry and Engineering Conference, Washington, DC, June 21–23, 2011. **(Poster, Pasquini [Gilbertson])**
4. *Green Design of Single-Walled Carbon Nanotubes: Decreased Bacterial Cytotoxicity via Addition of Surface Functional Groups*. Robert M. Langer Graduate Student Symposium, Yale University, December 10, 2010. **(Oral, Pasquini [Gilbertson])**
3. *Safer Design of Single Walled Carbon Nanotubes (SWNTs): A Comparative Bacterial Cytotoxicity Study of Pristine and Functionalized SWNTs*. American Chemical Society 14<sup>th</sup> Annual Green Chemistry and Engineering Conference, Washington, DC, June 21–23, 2010. **(Poster, Pasquini [Gilbertson])**

2. *Safer Design of Single Walled Carbon Nanotubes (SWNTs): A Comparative Bacterial Cytotoxicity Study of Pristine and Functionalized SWNTs*. 5<sup>th</sup> Annual Greener Nanoscience Conference, Portland, OR, June 16–18, 2010. (Poster, Pasquini [Gilbertson])
1. *Surface Enhanced Raman Spectroscopy Applied to Inorganic Compounds*. American Chemical Society 233<sup>rd</sup> National Meeting, Chicago, March 25–29, 2007. (Poster, Pasquini [Gilbertson])

## EXTERNALLY FUNDED RESEARCH PROPOSALS

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### Active

**National Science Foundation**, CAREER: *Combining Materials Science and System-Level Analysis to Sustainably Supply Safe Drinking Water* \$500,000.00, 5/1/2021 – 4/30/2026, **Gilbertson PI**

**National Science Foundation**, CBET No. 1935378, *Looking for the silver lining: Assessing the impact of silver in showerheads on opportunistic pathogen abundance and resistance*. \$330,000.00, 5/1/2020 – 4/30/2023, **Gilbertson PI**, Co-PI: Sarah Haig (CEE, Pitt), Jill Millstone (Chemistry, Pitt), Janet Stout (CEE Pitt and SPL of Pittsburgh)

**Pennsylvania Department of Transportation**, *Carbon Nanotube Additives for Structural and Highway Concrete*. \$219,092.32 (Total), \$70,064.00 (Gilbertson Portion), 10/31/2018 – 10/30/2020 (currently in no cost extension), **Gilbertson Co-PI**, PI: Stephen Sachs (Pitt)

**National Science Foundation**, CBET No. 1709031, *SusChEM: Collaborative Research: Decoupling Structure and Surface Chemistry Impacts of Carbon Nanomaterials on Environmentally Relevant Electrochemical and Biological Activity*. \$285,670.00 (Gilbertson portion), \$414,065.00 (total), 9/1/2017 – 8/31/2020 (currently in one-year no cost extension), **Gilbertson PI**, Co-PI: Perreault (ASU)  
Non-Academic Research Internships for Graduate Students (INTERN) supplemental funding \$48,976.00

### Pending

**United States Department of Agriculture**, *Sustainable Agrochemical Carriers (SACs): Development, Performance, and Feasibility* (\$650,000.00), **serve as PI**, Co-PIs: Elliott and Little

**National Science Foundation**, SRS RN: *Transforming Pennsylvania - a Convergent Human-centered Alliance for a new Rural-Urban System (CHARUS)* \$2,650,607.00 (total Pitt portion), 09/2021 – 08/2026, Drexel lead

**National Science Foundation**, ECO-CBET: *Sustainability from the Bottom Up: A Holistic Solution to Balancing the N-Cycle*, \$1,699,999.00, 9/1/2021 – 8/31/2025, PI

### Completed

**USGS 104B Water Resources Research Projects**, *Evaluating a Potential Win-Win for Water Quality Management in Pennsylvania: Systems-Level Quantitative Analysis of Abandoned Mine Drainage and Produced Water Co-Treatment*. \$20,000.00, 3/1/2016-12/31/2016, **Gilbertson PI**, Co-PI: Radisav Vidic (Pitt)

**United States Department of Agriculture**, Conference Grant, *Environmental Nanotechnology Gordon Research Conference and Seminar: A Platform for Cutting Edge Research in Nanotechnology Applications and Implications*. \$49,400.00, 3/17/17 – 7/23/17, **Gilbertson Co-PI**, PI: Sharon Walker (UCR, now Engineering Dean at Drexel)

**United States Environmental Protection Agency**, Conference Grant, *Environmental Nanotechnology Gordon Research Conference and Seminar: A Platform for Cutting Edge Research in Nanotechnology*

*Applications and Implications*. \$25,000.00, 3/17/17 – 7/23/17, **Gilbertson Co-PI**, PI: Sharon Walker (UCR, now Engineering Dean at Drexel)

**National Science Foundation**, Conference Grant, *Environmental Nanotechnology Gordon Research Conference and Seminar: A Platform for Cutting Edge Research in Nanotechnology Applications and Implications*. \$49,050.00, 3/17/17 – 7/23/17, **Gilbertson Co-PI**, PI: Sharon Walker (UCR, now Engineering Dean at Drexel)

## **EXTERNALLY FUNDED RESEARCH AWARDS**

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### Active

**3M Non-Tenured Faculty Award**. *Leveraging Nanomaterial Design for Next Generation Antimicrobials*. \$45,000.00 (\$15,000 per year for 3 years), start date 4/1/2017, **Gilbertson PI**.

**Gordon and Betty Moore Foundation, Moore Inventor Fellow Finalist**, *A Novel Platform for Improved Agriculture Nutrient Use Efficiency*. \$25,000.00, start date 7/1/2017 **Gilbertson PI**.

### Completed

**ORAU Ralph E. Powe Junior Faculty Enhancement Award**, *Simultaneous In Situ Characterization of Multiple Carbon Nanomaterial Properties Using Liquid Cell TEM-STEM at ORNL*. \$10,000.00, 6/1/2017 – 5/31/2018, **Gilbertson PI**.

**Mindlin Foundation**, *Teaching Sustainable Engineering Through Design Thinking*. \$10,000.00, 1 year, 5/1/2017 – 4/30/2018, **Gilbertson PI**.

## **GRADUATE AND UNDERGRADUATE STUDENT FELLOWSHIPS**

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### Active

**National Defense Science and Engineering Graduate Fellowship (NDSEG)**, \$198,000.00 (4 years full-support), 8/1/2017 – 7/31/2021; PhD student: Lisa Stabryla

### Completed

**Pittsburgh Paint and Glass (PPG) Graduate Research Fellowship**, *The Role of Nitrogen in Rational Design of Sustainable Antimicrobial Carbon Nanomaterials*. \$20,000.00 one year; PhD student: Nathália Aquino de Carvalho

**Mindlin Foundation Undergraduate Mentored Research Fellowship**, *Informing Design of Next Generation Materials for Civil Engineering*. \$5,000.00, 5/1/2018 – 8/31/2018; Undergraduate student: Nathaniel Buettner

## **INTERNALLY FUNDED RESEARCH PROPOSALS**

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### Active

**University of Pittsburgh Momentum Funds, Seeding Grant**, *Chemistries for Targeted Delivery of Agrochemicals: Development and Feasibility Testing*. \$18,000.00, 5/1/2020 – 4/31/2021, **Gilbertson PI**.

### Completed

**University of Pittsburgh Central Research Development Fund**, *A Coupled Modeling-Experimental Approach to Identify Hazardous Degradation Product Formation from Carbon Nanomaterial-Enabled Advanced Water Treatment Membranes*. \$17,940.00, 8/1/2018 – 6/30/2021, **Gilbertson PI**, Co-PI: Carla

Ng (Pitt).

**University of Pittsburgh Civil and Environmental Engineering Department Seed Grant, *Enhancing Predictive Models for Degradation Product Formation Using Network Analysis and Experimental Validation.*** \$70,000.00, 8/1/2018 – 7/31/2019, **Gilbertson Co-PI**, PI: Carla Ng (Pitt)

**University of Pittsburgh Central Research Development Fund, *Informing Sustainable Design of Carbon Nanomaterials through Heteroatom Functionalization.*** \$16,000.00, 8/1/2017 – 7/31/2018, **Gilbertson PI.**

**University of Pittsburgh Innovation in Education Awards, *Teaching Sustainable Engineering Through Design Thinking.*** \$15,000.00, 5/1/2017 – 4/30/2018, **Gilbertson PI.**

## CONTRIBUTIONS TO TEACHING

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**Courses Taught at the University of Pittsburgh** 2015 – Present

The curriculum of each course listed below has been developed with a particular focus on integrating active learning components to enhance student engagement with the course content. Opportunities for students to develop their written and oral communications skills is also emphasized. In addition, CEE1618 integrates the Design Thinking process in an effort to enhance students' innovative and creative problem-solving mindset in tackling engineering challenges and takes advantage of the University MakerSpaces.

Course	Type/Level	Term Taught	Enrollment	OMET Score (/5)
CEE2501: Environmental Engineering Chemistry	Lecture/Grad	Fall 2015	18	4.33
CEE2501: Environmental Engineering Chemistry	Lecture/Grad	Fall 2016	13	4.64
CEE1618: Design for the Environment	Lecture/Undergrad	Fall 2016	26	4.13
CEE2501: Environmental Engineering Chemistry	Lecture/Grad	Fall 2017	11	4.50
CEE1618: Design for the Environment	Lecture/Undergrad	Fall 2017	28	4.50
CEE1504: Chemistry for Environmental Engineers	Lecture/Undergrad	Summer 2018	3	NA <sup>1</sup>
CEE2501: Environmental Engineering Chemistry	Lecture/Grad	Fall 2018	10	4.40
CEE1618: Design for the Environment	Lecture/Undergrad	Fall 2018	26	4.81
CEE1504: Chemistry for Environmental Engineers	Lecture/Undergrad	Spring 2019	19	4.79
CEE2501: Environmental Engineering Chemistry	Lecture/Grad	Fall 2019	6	4.75

CEE1618: Design for the Environment	Lecture/Undergrad	Fall 2019	31	4.74
CEE1504: Chemistry for Environmental Engineers	Lecture/Undergrad	Spring 2020	11	NA <sup>2</sup>
Family Leave		Fall 2020		
CEE1504: Chemistry for Environmental Engineers	Lecture/Undergrad	Spring 2021	22	3.93 <sup>3</sup>
<b>Average graduate teaching effectiveness score</b>				<b>4.52</b>
<b>Average undergraduate teaching effectiveness score</b>				<b>4.26</b>

NA<sup>1</sup>: This course was developed for the undergraduate environmental engineering program and taught for the first time over the summer. Enrollment was not large enough to allow release of my teaching effectiveness scores. NA<sup>2</sup>: Not reported per approved exception for COVID-19 interruption.<sup>3</sup>Overall lower student satisfaction with instruction due to remote learning as indicated by survey self-report.

<b>Stanford d-School Teaching and Learning Studio</b>	July 2017
<b>National Effective Teaching Institute (NETI-1B)</b>	May 2017
<b>Guest Lecturer, University of Pittsburgh</b> Environmental Engineering Processes, CEE 1513, 1/14/16 (undergraduate, 55 students) Sustainable Computing, ECE 2195, 1/25/16 (graduate, 15 students)	
<b>Teaching Fellow</b> , School of Engineering and Applied Science, Yale University Green Engineering and Sustainable Design (mixed grad/undergrad, 30-40 students) Instructors: Dr. Julie B. Zimmerman, Dr. Mathew J. Eckelman	2011, 2012
<b>Teaching Fellow</b> , School of Forestry & Environmental Science, Yale University Greening Business Operations (graduate, 30 students) Instructors: Dr. Thomas E. Graedel, Dr. Marian Chertow, Dr. Julie B. Zimmerman	2010
<b>High School Chemistry and AP Chemistry Teacher</b> , Saint James School, MD	2009
<b>Advancement Via Individual Determination (AVID) Mentor</b> Humble Independent School District, Kingwood, TX	2009
<b>Teaching Fellow</b> , George Watson's College, Edinburgh, Scotland	2007 – 2008
<b>Chemistry Teaching Intern</b> , summer program, Northfield Mount Hermon School	2006

## GRADUATE STUDENTS

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### Ph.D. Students, Department of Civil and Environmental Engineering

<b>Mr. Patrick Dunn</b> (primary, sole advisor) <i>Source of Support:</i> U. Pitt Momentum Funds <i>Status:</i> Passed qualifying exam, May 2021	Anticipated graduation 2023
<b>Ms. Nathália Aquino de Carvalho</b> (primary, sole advisor) <i>Source of External Support:</i> PPG Graduate Research Fellowship, Award No. 1709031 <i>Source of Internal Support:</i> U. Pitt CRDF, Department TA	Anticipated graduation Fall 2021

*Status:* Passed proposal defense (Nathália started her PhD working in the lab of Dr. Kyle Bibby and transitioned to my lab in the Fall 2017)

**Mr. Trevor Sleight** (Co-advisor with Dr. Carla Ng) Graduated Summer 2021

*Source of Support:* US Air Force, CRDF

*Dissertation Title:* *Prediction and hazard estimation of polycyclic aromatic hydrocarbon transformation products.*

*Next position:* Faculty at Air Force Institute of Technology

**Ms. Lisa Stabryla** (primary, sole advisor) Graduated Summer 2021

*Source of Support:* NDSEG Fellowship, Mindlin Foundation Education Award

*Dissertation Title:* *Leveraging Nanomaterial Design for Next-Generation Antimicrobials*

*Next position:* National Research Council funded postdoctoral associate at NIST

**Ms. Yan Wang** (primary, sole advisor) Graduated April 25, 2020

*Source of Support:* NSF CBET Award No. 1709031, USGS 104B, PennDOT, ORAU Powe Jr. Faculty Award

*Dissertation Title:* *Toward Rational Design of Graphene Nanomaterials: Manipulating Chemical Composition to Identify Governing Properties for Electrochemical and Biological Activities*

*Current Position:* Postdoctoral Associate with Dr. Scown working on a collaborative project between UC Berkeley and Lawrence Berkeley National Lab

*Ph.D. Students, Department of Chemical and Petroleum Engineering*

**Jamie Mastropietro** (primary, sole advisor) Anticipated graduation 2025

*Source of Support:* NSF CBET Award No. 1935378

*Status:* Qualifying exam planned July 2021

*MS Students, Department of Civil and Environmental Engineering*

**Mr. Jason Geiger** (primary, sole advisor) Fall 2019 – Summer 2020

*Source of Support:* NSF CBET Award No. 1709031

**Mr. Tianyu Zhang** (primary, sole advisor) Graduated April 2019

*Source of Support:* U. Pitt CRDF

*M.S. Thesis Title:* *Methods Development for Isolation of Carbon Nanomaterial Degradation Products Under Simulated Conditions Relevant for their Proposed Use in Desalination Membranes.*

**Mr. Joshua Urso**, professional M.S. (primary, sole advisor) Graduated December 2018

*Source of Support:* 3M Non-Tenured faculty award

**Jiaoyang Yin**, professional M.S. (primary, sole advisor) Graduated Spring 2016

*Source of Support:* Self-funded, Department TA

**Sishan Li**, (primary, sole advisor), CEE 2996 *research for credit* Spring 2017

**Zhenqi Zhang**, (primary, sole advisor), CEE 2996 *research for credit* Spring 2017

## OTHER ADVISEES

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### Postdoctoral Associates, Department of Civil and Environmental Engineering

**Dr. Traci Clymer**, PhD in Chemistry (co-advisor with Dr. Carla Ng) 2019 (8 months)

*Source of Support:* Departmental New Collaborative Initiatives Grant

**Dr. Ashley Smith**, PhD in Chemistry (primary, sole advisor) 2018 (7 months)

*Source of Support:* Faculty Start-Up

*Current Position:* Assistant Professor of Chemistry, St. Francis College

**Dr. Leila Pourzahedi**, PhD in Civil and Environmental Engineering 2018 – 2019

*Served as co-advisor, Dr. Lowry at CMU served as primary advisor*

*Source of Support:* LC Nano (via Dr. Lowry)

*Current Position:* Senior Environmental Specialist, Owens Corning

### Undergraduate Students

#### *Department of Civil and Environmental Engineering*

**Daniel Huffman** (research for credit, SSOE summer research fellow; advisor) Spring - Summer 2021

*Project:* Impact of silver on opportunistic pathogens in shower water

**Courtney Emerson** (research for credit, advisor) Spring 2020

*Project:* Carbon sequestration using agriculture soils

**Ananya Mukherjee** (SSOE summer research fellow, advisor) Summer 2019

*Project:* Graphene-based biosensors

*PhD student mentor:* Yan Wang

**Rachel Fay** (MCSI summer research fellow, co-advisor with Dr. Carla Ng) Summer 2019

*Project:* Degradation of polyaromatic hydrocarbons

**Nathaniel Buettner** (Mindlin Foundation Fellow, advisor) 2017 –2018

*Project:* Enhancing concrete performance using carbon nanomaterials

*\*NSF-GRFP recipient based on research conducted with me*

**Rebecca Linick** (research for credit, co-advisor with Dr. Carla Ng) Fall 2017 – Spring 2019

*Project:* Network analysis of polyaromatic hydrocarbon degradation pathways

#### *Department of Chemical and Petroleum Engineering*

**Todd Ackerman** (MCSI summer research fellow, co-advisor with Dr. Bedewy) Summer 2020

*Project:* Silk-based lithography: A sustainable alternative towards green micro-/nano-manufacturing?

**Caitlin Sexton** (SSOE summer research fellow, advisor) Spring 2020 – Present

*Project:* Network analysis of polyaromatic hydrocarbon degradation pathways



*PhD student mentor:* Trevor Sleight

**Alexis Yates** (ChemE REU program, co-advisor with Dr. Carla Ng) Summer 2018

*Project:* Network analysis of polyaromatic hydrocarbon degradation pathways

**Sean Vinik** (ChemE REU program, advisor) Summer 2017

*Project:* Development of carriers for improved nutrient delivery to crops

*M.S. student mentor:* Joshua Urso

**Jasmine Toney** (MCSI summer research fellow, advisor) Summer 2016

*Project:* Bacteria interactions with N-doped carbon nanomaterials

*PhD student mentor:* Yan Wang

#### *Department of Mechanical Engineering and Materials Science*

**Bridget Moyer** (senior research project, advisor) Fall 2019

*Project:* Multi-cycle stability of graphitic carbon nitride for *E. coli* disinfection

*PhD student mentor:* Nathália Aquino de Carvalho

**Cole Daurizio** (MCSI summer research fellow, advisor) Summer 2017

*Project:* Bacteria growth response to silver nanoparticle exposure

*PhD student mentor:* Lisa Stabryla

**Hannah Laskey** (senior research project, advisor) Spring 2016

*Project:* Bacteria growth response to silver nanoparticle exposure

*PhD student mentor:* Lisa Stabryla

#### High School Students

**Rachel Bina**, North Allegheny High School 2019 – Present

*PhD student mentor:* Lisa Stabryla

**Liam Hainsworth**, Pittsburgh Science and Technology Magnet School 2017 – 2018

*PhD student mentor:* Yan Wang

## **HONORS AND AWARDS**

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NSF CAREER Award	2021
National Academy of Engineering Frontiers of Engineering Fellow, <i>Nominated</i>	2020
Mara H. Wasburn Early Engineering Educator Grant, Women in Engineering Division of ASEE	2019
Gordon and Betty Moore Foundation, Moore Inventor Fellow Top 10 Finalist	2017
Ralph E. Powe Junior Faculty Enhancement Award	2017
3M Non-Tenured Faculty Award	2017
Excellence in Review Award, Environmental Science & Technology	2016
Top 10 Reviewer Award, Environmental Science: Nano	2016
Yale-Jefferson Public Service Award, Yale University	2014

Harding Bliss Prize for Excellence in Engineering and Applied Science, Yale University	2014
National Science Foundation (NSF) Graduate Research Fellow	2012 – 2014
U.S. Environmental Protection Agency (EPA) STAR Fellow	2010 – 2012
Graduate School Community Service Award Finalist, Yale University	2011
ACS Green Chemistry Institute Ciba Travel Award	2010
National Science Foundation Scholar Conference Travel Award	2010
Emerson Electric Company Fellowship, Yale University	2009 – 2011
George Watson's College Teaching Fellowship, Hamilton College	2007
Undergraduate Student Award, NY Section of the Society for Applied Spectroscopy	2007
Levitt Scholar, Hamilton College	2007
Phi Beta Kappa, Hamilton College	2007
Dean's List Honors, Hamilton College	2003 – 2007

## PROFESSIONAL SERVICE ACTIVITIES

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### Internal

<b>Member of the CEE Graduate Committee</b> , Univ. Pittsburgh	2017 – Present
<b>Faculty Advisor, Society of Women Engineers</b> , Univ. Pittsburgh	2018 – Present
<b>Faculty Advisor, The Aquaponics Project</b> , Univ. Pittsburgh	2017 – Present
<b>Member of the CEE Faculty Search Committee</b> , Univ. Pittsburgh	2018 – 2019
<b>Member of the CEE Faculty Search Committee</b> , Univ. Pittsburgh	2017 – 2018
<b>Department Website Committee Lead</b> , Univ. Pittsburgh	2016 – 2019
<b>Department Graduate Seminar Organizer</b>	2017 – 2018
<b>Annual Women in STEM Conference</b> , Univ. Pittsburgh	2017, 2020
Co-organizer, <i>Perfecting Your Pitch: Effective Scientific Communication from the Classroom to the Boardroom (2020)</i>	
Panelist, <i>Work-Life Balance Panel Discussion (2017)</i>	
Speaker, <i>Why You Should Consider Environmental Engineering (2017)</i>	
<b>Department point person</b> for new ENG 2900 graduate fellowships workshop course	Fall 2016
<b>PhD Committee Member</b> , University of Pittsburgh	2015 – Present
19 in the Department of Civil and Environmental Engineering	
2 in the Department of Chemistry	
<b>MS Committee Member</b> , University of Pittsburgh	2015 – Present
1 in the Department of Civil and Environmental Engineering	

### External

**Journal Reviewer** for Environmental Science and Technology, Environmental Science and Technology Letters, Nature Nanotechnology, Nature Food, ACS Nano, Carbon, Nanoscale, Environmental Science: Nano, Journal of American Chemical Society, ACS Sustainable Chemistry and Engineering, ACS Applied Materials and Interfaces, ACS Applied Bio Materials, Environmental Science: Water Research and Technology, Langmuir, Chemical Research in Toxicology, Environmental Pollution, Chemical Engineering Journal, Advances in Colloid and Interface Science, Construction and Building Materials,

Environmental Research, Materials Chemistry and Physics, Water Research, Scientific Reports, Journal of Materials Chemistry B, NanoImpact, Journal of Advanced Research, Critical Reviews in Environmental Science and Technology, Journal of Chemical Education, Green Chemistry, Advances in Engineering Education

**NSF Panel Reviewer** for *CBET*: Environmental Engineering Program, Environmental Sustainability Program, and Biological and Environmental Interactions of Nanoscale Materials Programs, and *CMMI*: Nanomanufacturing Program

***Environmental Science: Nano***, Journal Advisory Board Member 2020 - present

**Session Chair**, *Environmental, Human, and Microbial Nanotoxicology*, Sustainable Nanotechnology Organization Conference, Virtual, November 3-5, 2021.

**Advisory Committee Member**, *2021 Green Chemistry and Green Engineering Conference*, Reston, VA

**Advisory Committee Member**, *2020 Green Chemistry and Green Engineering Conference*, Seattle, WA

**Scientific Committee Member**, *2019 World Carbon Conference*, Lexington, KY

**Session Co-Chair**, *Advances in Carbon Nanomaterial Design and Applications for Environmental Sustainability*, Division of Environmental Chemistry, 256<sup>th</sup> ACS National Meeting and Exposition, Boston, MA August 19-23, 2018

**Member of the Water Works Operators' Association of Pennsylvania (WWOAP) Scholarship Committee**, 2018

**Session Moderator**, *Advancing Community Health Through Technology Innovation: Physical-Chemical Session*, Association of Environmental Engineering & Science Professors (AEESP) Research and Education Conference, University of Michigan Ann Arbor, June 20-22, 2017.

**Chair**, Environmental Nanotechnology Gordon Research Seminar (GRS), Stowe, VT, June 17-18, 2017

**Session Chair**, *Sustainable Materials*, Green Chemistry and Engineering Conference, Portland, OR, June 14-16, 2016

**NSF-AEESP Grand Challenge Workshop Participant** on redefining environmental engineering and science, Rice University Houston, TX, March 31 – April 1, 2016

**Session Chair**, *Industrial Ecology and Manufacturing*, Sustainable Nanotechnology Organization (SNO) Conference, Portland, OR, November 8-10, 2015

**NSF Workshop Participant**, the Role of Nanotechnology in Achieving Sustainability at the Food-Energy-Water (FEW) Nexus, Carnegie Mellon University Pittsburgh, PA, October 19-20, 2015

**Session Chair**, *LCA at the Technology Nexus: Evaluating Tradeoffs* and *LCA at the Energy Nexus*, Association of Environmental Engineering & Science Professors (AEESP) Research and Education Conference, Yale University New Haven, CT, June 13-16, 2015.

**Registration & Communications Manager**, Association of Environmental Engineering & Science Professors (AEESP) Research and Education Conference Committee, Yale University New Haven, CT, Fall 2014 – Summer 2015

**Chair**, Professional Development Panel at the Environmental Nanotechnology Gordon Research Seminar (GRS), West Dover, VT, June 20-21, 2015.

**Women in Science at Yale Mentor**, Two PhD students, Yale University, 2014 – 2015

**Research Mentor**, Chemical and Environmental Engineering, Yale University, 2014 – 2015

2 PhD students, 1 female undergraduate, 1 female visiting researcher, 2 high school students (1 female)

**Advanced Graduate Leadership Program K-12 Outreach Fellow**, School of Engineering & Applied

Science, 2011 – 2014

**Pathways to Engineering Day Organizer**, Yale University, 2011-2012

**Yale Summer SCHOLAR Instructor**, Yale University, summer 2012

**Recruitment Committee Member**, Environmental Engineering, Yale University, 2010 & 2012

**Planning Committee Member & Panel Moderator**, U.S. EPA STAR Conference, September 2011

**Science & Engineering Enrichment Program Volunteer**, Yale University, 2010 – 2011

**Langer Symposium Committee Member**, Yale University, 2009 & 2013

**President**, American Chemical Society Student Chapter, Hamilton College, 2007

## **CONTRIBUTIONS TO DIVERSITY**

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Served on the department faculty search committee for two positions in sustainable and environmental engineering (2017-2018); 67% of the nine candidates interviewed on campus were *female* and 44% were an *underrepresented minority*.

Advised or co-advised *three female* postdoctoral associates (Dr. Clymer, Dr. Pourzahedi, Dr. Smith).

Serve(d) as primary advisor to *four female* PhD students, including one URM student (Dr. Wang, Nathalia Aquino de Carvalho, Dr. Stabryla, Jamie Mastropietro).

Mentored *female URM undergraduates* through the MCSI summer research fellowship (Jasmine Toney) and departmental research for credit (Courtney Emerson). Mentor URM student Daniel Huffman.

Mentored *two female* master's students (Ms. Li, Ms. Yin), six additional *female undergraduate* students, (Ananya Mukherjee, Rachel Fay, Caitlin Sexton, Alexis Yates, Bridget Moyer, Hannah Laske), and *one female* high school student (Rachel Bina).

Mentored and *published a paper* in Environmental Science & Technology (2016 publication) with a *female minority undergraduate student* (Eva Albalghiti) who worked with me during my graduate and postdoctoral career (2014-2015).

## **CONSULTING ACTIVITIES**

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Scientific advisory board member for Invaio Sciences, a Flagship Pioneering agriculture start-up in Cambridge, MA (2019 – 2020)

STEM Education Consultant for Finn Partners, consulted on content for ExxonMobil's Be An Engineer campaign (May 2015 – February 2016)