

## **Laura G. Mast**

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### EDUCATION

#### **Georgia Institute of Technology, Atlanta GA**

*Ph.D. Candidate, Environmental Engineering*

GPA: 3.85/4.00

Expected Dec 2020

#### **Vanderbilt University, Nashville TN**

*BA, Departmental Honors, Chemistry*

Minor: Environmental Studies

GPA: 3.64/4.00

May 2014

### RESEARCH EXPERIENCE

#### **Environmental Engineering, Georgia Institute of Technology**

*National Science Foundation Fellow*

Aug 2014-present

- Working to assess and improve the potential of recovery of rare earth elements from coal combustion and incineration solid wastes.
- Design and optimization of ligand-enhanced methods and ligand functionalized nanomaterials for more effective and environmentally sustainable extraction, separation, and recovery of rare earth elements from waste materials.

#### **Beckman Scholars Program, Vanderbilt University**

*Undergraduate Researcher*

Jan 2013-Aug 2014

- Achieved nanoparticle solubility by utilizing the double bond chemistry of common ligands to replace hydrophobic functional groups with hydrophilic groups using Grubbs' metathesis.
- Received honors research credit through the Chemistry Department.
- Paid 15-month fellowship through Beckman Scholars Program.

#### **Independent Research Project, Vanderbilt University**

*Undergraduate Researcher*

Aug-Dec 2012

- Continued methods analysis of heavy metal quantification in soils and plant tissues, focusing on comparing energy-dispersive x-ray fluorescence spectrometry to inductively coupled plasma methods.

#### **NSF-REU, University of Wisconsin-Milwaukee/Great Lakes WATER Institute**

*Research Experience for Undergraduates Intern*

May-Aug 2012

- Conducted a methods analysis of heavy metal quantification in soils and plant tissues using flame atomic absorption spectrometry, inductively coupled plasma-mass spectrometry, wavelength-dispersive x-ray fluorescence spectrometry, and energy-dispersive x-ray fluorescence spectrometry.

### TEACHING EXPERIENCE

#### **Center for Teaching and Learning, Georgia Institute of Technology**

*TA Fellow*

May 2016-May 2018

- Prepared and delivered presentations on TA roles and responsibilities, policies and procedures, and sound teaching techniques at TA Orientation each fall and spring to over 500 students total.
- Promoted and demonstrated active learning techniques throughout presentations.

#### **Environmental Engineering, Georgia Institute of Technology**

*Graduate Student Teaching Assistant*

Aug 2015-May 2016

- Instructor for CEE 3340: Environmental Engineering Laboratory for two semesters (~ 40 students).
- Prepared weekly lectures, organized and ran weekly laboratory exercises, giving the students opportunities to build and demonstrate the capability to study environmental samples, conduct laboratory experiments, critically analyze experimental data, and coherently present the results.

**SERVICE AND OUTREACH EXPERIENCE**

**500 Women Scientists, Atlanta POD// Union of Concerned Scientists** Nov 2018-present  
*Executive Board*

- Elected to coordinate events within the pod, including monthly networking mixers, and with the greater community, i.e. in conjunction with the Atlanta Science Festival.
- Connected pod with the Union of Concerned Scientists in December 2018.

**Envirobites blog** Nov 2018-present  
*Executive Board*

- Coordinate publication editing (see **Writing** below).
- Perform statistical analysis (R studio) on readership, write bios on featured writers, collect news, and more for the monthly newsletter. Distribute to listserv via Mailchimp.

**Atlanta Science Festival** Aug 2018-present  
*Science Communication Fellow*

- Selected to be one of nine Fellows to develop expertise in narrative techniques in science communication, directing language for different audiences, developing demonstrations and public programs related to the fellow's field of study, and data visualization.
- Deliverables include to conduct an interview and write corresponding article to be posted to the Science ATL Blog as well as to design and execute a public engagement activity.

**ComSciCon-Atlanta** Jun 2017-present  
*Lead Organizing Chair 2018*

- Coordinated the first-ever ComSciCon-Atlanta, a two-day workshop for graduate students to explore science communication. Covered a variety of topics including the importance of interdisciplinary collaboration, creative outlets, how to remain engaged while in academia, and developed skills in science writing, data visualization, mock interviews, storytelling, and more.
- Raised ~\$20,000 in funding from local universities and companies, invited and coordinated 30+speakers and panelists, accepted 50 attendees (reviewed from >125 applicants).

*Advisory Chair 2019*

- Advised new organizing committee as they plan ComSciCon-Atlanta 2019.

**Shut up and Write Initiative!** Jun 2018-present  
*Founder, Member*

- Coordinate and run weekly writing meeting for graduate students, provide professional resources and guides for improved writing practice to attendees, manage program budget (\$1k/year).

**Graduate Student Advisory Council, School of Civil & Environmental Engineering** Jun 2017-present  
*Member*

- Provide feedback on the overall graduate program, including reviewing assessment data and suggesting ways to improve the School and its programs.
- Serve as ambassador to the External Advisory Board, alumni, supporters, and prospective students.
- Coordinate and run social and professional programs for current graduate students.

**Grad Groups at Georgia Tech** May-Dec 2017  
*Grad Group Leader*

- Led a group of 15 first year graduate students through the nuances and challenges of graduate school.
- Covered topics including career development and planning, maximizing the advisor/advisee relationship, stress and time management, and maintaining work/life balance.

**Development of Water Treatment Education Project** May 2016-present  
*Lead Developer and Outreach Coordinator*

- Awarded \$1000 for a proposal on "Water Treatment Education" for demos with school-age children.
- Discussed impacts of pollution and sound water management with students of varying ages, brainstorming habits and activities they do that contribute to water use.
- Hosted events at Georgia Tech and traveled to local schools to perform demonstration.

**Math and Science Partnership**

Apr 2014-Aug 2016

*Instructor*

- Represented Georgia Tech as instructor in an integrated program between Georgia Tech Center for Education Integrating Science, Mathematics, and Computing and Gwinnett County Public Schools.
- Developed content for courses in science (life, earth, and physical science), and math (numbers & operations, algebra, and geometry) for elementary teachers so they may earn an endorsement (analogous to a certificate of proficiency) in math or science education.
- Augmented the technical expertise of the instructor on specific math and science concepts as needed, helping to develop lecture materials, in-class demonstrations, etc.

**Women in Engineering, Georgia Institute of Technology**

Aug 2014-present

*Volunteer*

- Visited several schools and conducted demos on engineering concepts such as building integrity (building structures from uncooked spaghetti and gummies) and locomotion (balloon-powered cars).
- Discussed careers in science and engineering with children of different age groups.

**FELLOWSHIPS AND AWARDS****John Scarano Memorial Fellowship, Alliance of Hazardous Waste Professionals** Dec 2018

- Awarded to support deserving students in environmental health and safety.

**Science ATL Communication Fellowship, Atlanta Science Festival** Aug 2018

- Selected to be one of nine Fellows for a new program from the Atlanta Science Festival to train graduate students and postdocs in science communication.

**Future Faculty Fellowship, Georgia Institute of Technology** Apr 2017

- Awarded by the Civil and Environmental Engineering department to support excellent graduate students through teaching skill development and exploration of academic career opportunities.

**5<sup>th</sup> Annual ComSciCon Workshop, Harvard University** Apr 2017

- Highly competitive workshop series for graduate students interested in communicating complex and technical science outside of practitioners in the field.

**Graduate Research Fellowship, National Science Foundation** Apr 2016

- Awarded by the NSF to recognize and support outstanding graduate students in NSF-supported STEM disciplines who are pursuing doctoral degrees at accredited United States institutions.

**Mini-Grant for Science Education, Georgia Section of American Chemical Society** May 2016

- Awarded \$1000 for a proposal on “Water Treatment Education” to teach school-age children about flocculation, coagulation, and filtration.

**Scholarship Award, Environmental Research and Education Foundation** Sept 2015

- Awarded by the EREF to recognize excellence in doctoral waste management research and education. Awardees are chosen based on academic performance, professional experience, relevance of project to the advancement of solid waste management science, and potential for success.

**Graduate Research Assistantship, Georgia Institute of Technology** Aug 2014

- Paid research assistantship through the Civil and Environmental Engineering Department.

**President's Fellowship, Georgia Institute of Technology** Aug 2014

- Competitive fellowship of \$5500/y awarded to promising doctoral students to assist them in preparing themselves for outstanding careers in the discipline of their choice.

**Beckman Scholar's Fellowship, Vanderbilt University** Jan 2013

- Awarded Fellowship from the Arnold and Mabel Beckman Foundation.
- Funded 15 months of honors research as well as provided lab and travel funding.

## PEER-REVIEWED PUBLICATIONS

Leach, A. D. P., Mast, L. G., Hernández-Pagán, E. A., & Macdonald, J. E. (2015). Phase dependent visible to near-infrared photoluminescence of CuInS<sub>2</sub> nanocrystals. *Journal of Materials Chemistry C*, 3(14), 3258-3265.

## POPULAR SCIENCE PUBLICATIONS

Mast, Laura. "Year-Round Cheers for the Periodic Table @ Georgia Tech." *Georgia Institute of Technology College of Sciences*. 8 January 2019. Web. <<https://cos.gatech.edu/news/year-round-cheers-periodic-table-georgia-tech>>

Mast, Laura. "100 vignettes that will make you excited to talk about the weather." *Massive Science Consortium*. 6 December 2018. Web. <<https://massivesci.com/articles/weather-andy-revkin-book-review/>>

Mast, Laura. "City phosphorus, country phosphorus: can we mitigate P in different environments?" *envirobites*. 23 October 2018. Web. <<https://envirobites.org/2018/10/23/city-phosphorus-country-phosphorus-can-we-mitigate-p-in-different-environments/>>

Mast, Laura. "Shortages of rare earth elements could limit clean energy development." *Massive Science Consortium*. 5 October 2018. Web. <<https://massivesci.com/articles/rare-earth-elements-metals-not-really-that-rare/>>

Mast, Laura. "Please romaine calm- there might be cancer-causing compounds in your lettuce." *envirobites*. 7 Jun 2018. Web. <<https://envirobites.org/2018/06/07/please-romaine-calm-there-might-be-cancer-causing-compounds-in-your-lettuce-and-fruits-and-other-vegetables/>>

Mast, Laura. "ComSciCon-Atlanta Annual Report." *ComSciCon*. 30 May 2018. Web. <<https://comscicon.com/comscicon-atlanta-2018>>

Mast, Laura. "Coal ash contains lead, arsenic, and mercury – and it's mostly unregulated." *Massive Science Consortium*. 16 May 2018. Web. <<https://massivesci.com/articles/coal-ash-water-health-hazard/>>

Mast, Laura. "How our obsession with nanotechnology is building antibiotic resistance." *envirobites*. 16 Apr 2018. Web. <<https://envirobites.org/2018/04/16/how-our-obsession-with-nanotechnology-is-building-antibiotic-resistance/>>

Mast, Laura. "A Hazy Outlook over the North China Plain." *envirobites*. 20 Feb 2018. Web. <<https://envirobites.org/2018/02/20/a-hazy-outlook-over-the-north-china-plain/>>

Mast, Laura. "Putting the cart before the horse: the danger of oil sands before the pipeline." 13 Dec. 2017. Web. <<https://envirobites.org/2017/12/13/putting-the-cart-before-the-horse-the-danger-of-oil-sands-before-the-pipeline/>>

Mast, Laura. "Betcha won't drink it! The natural chemicals hiding in water, and how a new technique hopes to remove them using an unlikely ally- bacteria." 23 Oct 2017. Web. <<https://envirobites.org/2017/10/23/betcha-wont-drink-it-the-natural-chemicals-hiding-in-water-and-how-a-new-technique-hopes-to-remove-them-using-an-unlikely-ally-bacteria/>>.

Mast, Laura. "Familiar ground: How a high school internship prepared Kathrine Udell to jump right into research as a freshman." *CEE News Release*. Georgia Institute of Technology School of Civil and Environmental Engineering, 2 Feb 2016. Web. <<http://www.ce.gatech.edu/news/familiar-ground-how-high-school-internship-prepared-kathrine-udell-jump-right-research-freshman>>.

Mast, Laura. "Scott, Johansen give Atlanta-area teachers concrete ways to make science, engineering their students." *CEE News Release*. Georgia Institute of Technology School of Civil and Environmental Engineering, 24 Jun 2015. Web. <<http://ce.gatech.edu/news/scott-johansen-give-atlanta-area-teachers-concrete-ways-make-science-engineering-exciting-their>>.

Mast, Laura. "Does Better Sanitation Mean Healthier Children? A First-of-its-kind Test Case in Mozambique Will Tell Us." *CEE News Release*. Georgia Institute of Technology School of Civil and Environmental Engineering, 6 May 2015. Web. <<http://ce.gatech.edu/news/does-better-sanitation-mean-healthier>>

children-first-its-kind-test-case-mozambique-will-tell-us>.

Mast, Laura. "A place to learn: Alumna helps build a new future for Peruvian Children." *CEE News Release*. Georgia Institute of Technology School of Civil and Environmental Engineering, 25 Feb 2015. Web. <<http://ce.gatech.edu/place-learn-alumna-helps-build-new-future-peruvian-children>>.

## CERTIFICATES

**Tech to Teaching Certificate, Georgia Tech Center for Teaching and Learning** Sept 2015-present  
*In progress*

- Designed to prepare Georgia Tech graduate students and postdocs for college teaching positions.
- Requires both coursework and practicum to ensure a thorough understanding of the scholarship of teaching and learning as well as demonstrated ability to skills in the classroom.

**Graduate Communication Certificate, Georgia Tech Library** Sept 2015-present  
*In progress*

- Designed to build communication proficiency through workshops and seminars covering written, oral and visual communication competencies.

## WRITING EXPERIENCE

### **envirobites**

*Lead Publication Editor* July 2018-present

- Recruit and train publication editors to evaluate publications for grammar, formatting, figures, jargon, etc. for articles published daily.

*Writer/peer editor* July 2017-present

- Write articles translating peer-reviewed journal articles for the public; engage in peer review with other authors. Writing and peer editing performed on a monthly basis.

### **Massive Writing Consortium**

*Certified Storyteller* Mar 2018-present

- Pitch, interview, and write articles on science for the public.

**Georgia Tech School of Civil and Environmental Engineering** Jan 2015-present

*Writing Assistant*

- Enhance nontechnical writing skills through conducting interviews and writing news articles bimonthly for the Civil and Environmental Engineering Department website.

## ENTREPRENEURSHIP

**Populy Voting Systems** Apr 2016-present

*Vice President of Business Development*

- Work with clients to customize electronic voting platform to their unique event as account manager, guiding them from the basics of event set up through the successful completion of their event.
- Develop and enact different marketing strategies to attract and retain new clients.
- Collect customer feedback and share with programming team to prioritize new software features.
- Expand and capture new market channels beyond senior design expos and undergraduate poster sessions to professional conferences, high school science fairs, and more.

## PROFESSIONAL AFFILIATIONS

American Association for the Advancement of Science

American Chemical Society

National Association of Science Writers

Union of Concerned Scientists

Association of Environmental Engineers and Scientists

Society of Environmental Toxicology and Chemistry