

## CURRICULUM VITAE

Dr. Amanda Simson                      212-353-4373  
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### **Overview of Positions**

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The Cooper Union: Assistant Professor of Chemical Engineering, August 2017 – Present

*Teaches chemical engineering courses and does research in engineering education and alternative energy*

University of New Haven: Assistant Professor of Chemical Engineering, August 2015 – August 2017

*Taught chemical engineering courses and did research in heterogeneous catalysis*

Watt Fuel Cell (Port Washington, NY): Fuel Processing Engineer, October 2013 – June 2015

*Managed all research and production activities related to the conversion of fuels for solid oxide fuel cells*

Columbia University: Postdoctoral Research Scientist, February 2013 – October 2013

*Established a laboratory and research group for newly appointed Professor Robert Farrauto*

Columbia University: Graduate Research Assistant, August 2008 – February 2013

*Conducted research in catalysis sponsored by an industrial partnership with BASF*

Teach for America: Miami-Dade Charter Corps Member, June 2003 – June 2005

*Taught eighth grade math as a corps member of the newly founded Miami-Dade site*

### **Education**

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Columbia University, New York, NY

Doctor of Philosophy, Earth and Environmental Engineering, Conferred May 2013

Advisors: Dr. Marco Castaldi and Dr. Robert Farrauto

Concentration: Heterogeneous Catalysis for Alternative Energy Applications

University of Virginia, Charlottesville, VA

Bachelors of Science, Aerospace Engineering, Conferred May 2003

## Teaching Experience: Courses

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The Cooper Union for the Advancement of Science and Art (Assistant Professor)

- Thermodynamics I and II
- Chemical Reaction Engineering
- Senior Laboratory I
- Environmental Catalysis
- Freshman Engineering Design and Problem Solving (Course Coordinator)
- Chemical Reaction Engineering
- Sustainability (co-taught)

Bronx Community College (Visiting Adjunct Professor)

- Introduction to Energy Engineering

The University of New Haven (Assistant Professor)

- Senior Chemical Engineering Laboratory
- Thermofluids Analysis
- Thermodynamics
- Engineering Modeling

Teaching Assistant, Columbia University (2009-2010)

Democracy Prep Charter School (Middle School Math Teacher)

Jose de Diego Middle School (Math Teacher, Chair of Math Department)

## Highlights of Teaching Experience

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- Co-developed the first [Cooper Climate Week](#) with two students, that evolved into the Cooper Climate Coalition, a student-led organization I advise.
- Co-developed chemistry card game [Valence](#) to teach chemistry concepts to kids using ninjas It has sold over 10,000 units and has been featured in [Nature](#) amongst many other media sites.
- Advisor on curriculum for [Science Ninja's](#), a comic series to teach kids science and for [The Pop-Ups](#), a children's music group that produces educational content. Featured on Grammy-nominated album "Giants of Science." Helped develop [2C or not 2C](#), a climate change podcast for kids.
- Founded a citywide competitive math league in New York City with 15-20 schools and 200-1000 students participating per year from 2006-2014.
- Coordinator for EID101, the Cooper Union's freshman engineering and design. Developed a co-teaching model for the course and redesigned it centering ethics and participatory design principles.

## Peer Reviewed Publications, Patents, and Popular Press

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### Chemical Engineering, Peer Reviewed

- Uddin, M., Simson, A., Mba-Wright, M. “Techno-economic and greenhouse gas emission analysis of dimethyl ether production via the bi-reforming pathway for transportation fuel” *Energy* Volume 211, November 2020
- Abdallah, M., Ni, D., Simson, A. “Pyrolysis and CO<sub>2</sub> gasification of biowastes as an alternative BECCS process” *Biomass and Bioenergy*, Volume 143, December 2020
- Simson, A., Crowley, S., Castaldi, M., “The Impact of Sulfur on Ethanol Steam Reforming” *Catalysis Letters* available May 2016 Pages 1-12
- Simson, A., Roark, K. Farrauto, R., “Niobium containing oxygen storage materials for the three way catalyst” *Applied Catalysis B: Environmental* Volume 158-159, October 2014, Pages 106-111
- Simson, A., Farrauto, R., Castaldi, M. “Steam reforming of ethanol/gasoline mixtures: Deactivation, regeneration and stable performance” *Applied Catalysts B: Environmental* Volume 106 Issues 3-4, August 2011, Pages 295-303
- Simson, A. Waterman, E., Farrauto, R., Castaldi, M. “Kinetic and Process study for ethanol reforming using a Pt/Rh Washcoated monolith catalyst” *Applied Catalysis B: Environmental* Volume 89, Issues 1-2, June 2009, Pages 58-64

### Patents

- Finnerty, C., Isenberg, M., Simson, A., inventors; Active Filtration system for hydrocarbon fuels, methods, and filter elements. US patent 12,028,258. February 19, 2019.

### Chemistry and Chemical Engineering Education, Peer Reviewed

- Simson, A., & Broughton, L. C., & Biddinger, E. J. (2019, June), *Program Evaluation of a High School Summer Bridge Program in Chemistry and Engineering (Evaluation)* Paper presented at 2019 ASEE Annual Conference & Exposition , Tampa, Florida. <https://peer.asee.org/33198>
- Simson, A., & Randi, J., & Becker, A. L. (2017, June), *Assessing the Value of Different Techniques for Teaching Technical Communication Skills* Paper presented at 2017 ASEE Annual Conference & Exposition, Columbus, Ohio. <https://peer.asee.org/27628>
- Erdil, N. O., & Harichandran, R. S., & Collura, M. A., & Nocito-Gobel, J., & Adams, D. J., & Simson, A. (2016, June), *Preliminary Assessment of and Lessons Learned in PITCH: an Integrated Approach to Developing Technical Communication Skills in Engineers* Paper presented at 2016 ASEE Annual Conference & Exposition, New Orleans, Louisiana. 10.18260/p.25944

### Popular Press

- Rabinowitz, A., Simson, A. “The Dirty Secret of the World’s Plan to Avert Climate Disaster” [www.wired.com](http://www.wired.com), Published December 10, 2017 (feature article)

## Highlights of Research Career, Academic/Industrial

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- Developed industrial process from benchtop research to produce hydrogen for Watt Fuel Cell's two-kilowatt solid oxide fuel cell. Managed technicians and oversaw dozens of chemical reactors for research, testing, and all initial manufacturing related to the catalytic process.
- After completing an internship at BASF Catalysts in Iselin, NJ (2008), became first participant in joint BASF-Columbia partnership to fund graduate research. Selected participant in the BASF International Summer Course for PhD students (2009).
- Presented PhD findings at BASF Catalysts monthly lecture series in Iselin, NJ, was awarded Best Paper Award in the Environmental Catalysis Division at the Annual ACS Meeting (2009) and received the International Precious Metal Institute Graduate Student Award (2009). Received Kokes award from North American Catalysis Society (2009, 2011, 2013).
- Trained in analytical and materials characterization techniques (GC, GCMS, TGA, XPS, TEM, SEM-EDX, XRD, CO-Chemisorption, BET). Trained in Advanced Methods in XRD (ICDD Scholarship Award Winner, 2013).
- Volunteer scientist on the *Oceanus* research vessel measuring methane emissions in the Gulf of Mexico following the *Deepwater Horizon* oil spill (2010).
- Received NASA Space Grant Fellowship (2002) and won first place in national NASA design competition (2002).

## Service

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### Committees and Councils:

- Council on Shared Learning (co-chair)
- Admissions Committee (member, and department representative)
- Community Planning Collaborative (member)

### Mentorship and Affiliations:

- American Association for the Advancement of Science
- American Institute of Chemical Engineers (AIChE), AIChE Education Division, AIChE Catalysis and Reaction Engineering Division, Metro NY Chapter Member
- American Society Engineering Education (ASEE), ASEE Chemical Engineering Division, Liberal Education/Engineering & Society Division

### Licenses and Certifications:

- LGBTQ Safe Zone Certification (2017)
- New York City Fire Department C-14 Laboratory Safety Certification

## Grants and Funding

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NSF-ATE Grant (co-PI, Cooper Union subcontract), Cooper Union President's Grant (2017), Cooper Union Dean's Grant Award (2018)

## **Mentorship and Student Theses**

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### Former Masters Students:

- Monica Abdallah (ME'19). Thesis title: "Pyrolysis and CO2 Gasification of Bio-waste as a Pathway to Carbon Negative Electricity"
- Derek Ni (ME'20). Thesis title: "The Kinetics of the Reverse Boudouard Reaction in a Potential BioEnergy with Carbon Capture and Storage Process"

### Current Masters Students:

- Dave Chun (ME'21)
- Kevin Chen (co-advised, ME'21)
- Matthew Grattan (ME'21)