

# Yang Han

Ph.D. in Atmospheric Science

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## Research Background

- Atmospheric chemistry
- Environmental engineering
- Field and laboratory instrumentation
- Greenhouse gas (GHG) emission inventory

## Education

<b>Doctor of Philosophy in Atmospheric Science</b>	12/2019
University of Nevada, Reno / Desert Research Institute, Reno, NV	
<b>Master of Science in Atmospheric Physics</b>	06/2013
Nanjing University of Information Science & Technology, China	
<b>Bachelor of Engineering in Environmental Engineering</b>	06/2010
Nanjing University of Information Science & Technology, China	

## Professional Experience

### Desert Research Institute (DRI), Reno, NV

Volunteer Researcher, 02/2020-12/2021

- Evaluated pollutant emissions and particle concentration during lithium-ion battery thermal runaway events.
- Drafted progress reports and a review paper.

### Desert Research Institute (DRI), Reno, NV

Graduate Research Assistant, 01/2016-12/2019

*Project 1: Sustainable Biocrude Production Using Hydrothermal Liquefaction of Microalgae Biomass (National [Qatar] Priority Research Program)*

- Developed and updated research and experimental protocols; executed research techniques, tests, and analyses as the principal researcher of this project.
- Designed and fabricated an in-situ sampling system to collect gaseous products from HTL treatment using LabVIEW software and National Instruments CompactDAQ System.
- Prepared and submitted 4 progress reports and one dissertation thesis, published 2 high-quality peer-reviewed papers.
- Conducted life cycle assessments (LCA) on the biofuel conversion process.

*Project 2: Distributed Power from Waste Biomass (USDA Sun Grant Program)*

- Coordination collaborative research project involving operation and maintenance of a small, downdraft gasifier (Vulcan Gasifier, MI, USA).
- Design, fabrication, and operation of the gas collection system used to sample syngas. This system consisted of three sampling lines which included (1) collection of NH<sub>3</sub> on citric acid filters, (2) collection of syngas samples in evacuated canisters, and (3) real-time monitoring of syngas utilizing a Testo 350 gas analyzer (Testo 350 XL, Flanders, NJ).
- Analyzing and interpreting volatile organic compounds (VOCs) from canisters with GC-MS

*Project 3: Life-Cycle Energy, Water, and GHG Benefits of Residential Solar PV System in Nevada (NSF EPSCoR – Track 1 NEXUS Seed Grant)*

- Investigated the life-cycle environmental impacts of a residential-scale photovoltaic (PV) system with and without the inclusion of a battery storage system.
- Determined the amount of embedded energy in the PV and battery systems, the energy payback time of the systems, the energy return on investment (EROI), the amount of water savings from reduced use of grid power, and the amount of greenhouse gases (GHG) avoided.

**Hebei Weather Modification Office, China**

Assistant Engineer, 07/2013-12/2015

- Analyzed and interpreted aircraft instrumentation data by conducting statistical analysis of aerosol and cloud properties following QA/QC procedures.
- Installation, calibration, and troubleshooting Particle Measuring System (PMS) airborne aerosol spectrometer probes mounted on aircraft

**Nanjing University of Information Science & Technology, China**

Graduate Research Assistant, 09/2010-06/2013

- Quantified greenhouse gas (CO<sub>2</sub>, CH<sub>4</sub>, and N<sub>2</sub>O) emission fluxes from water-air interfaces by year-round field experiments. This included floating static collection chambers design and deployment, greenhouse gas flux quantification by gas chromatography analysis, and boundary line models for greenhouse gas emissions from water bodies in Nanjing, China
- Measured the physical and chemical characteristics of water quality (pH value; Dissolved Oxygen; Chemical Oxygen Demand; Spectrophotometric analyses of Total Nitrogen & Phosphorus, Nitrite Nitrogen, Nitrate Nitrogen, Ammonium-Nitrogen, and Chlorophyll-A)

**Training**

Annual Laboratory Safety/Managing Hazardous Waste training, Desert Research Institute, 2016-2019

Hazardous materials shipping training, Desert Research Institute, 2017

Training for fire extinguishers use, Desert Research Institute. 2018

Python Programming Track, Data Camp, July 2020

## Progress Reports

Hoekman, S.K., **Han, Y.** 2019. Sustainable Biocrude Production Using Hydrothermal Liquefaction of Microalgae Biomass. *For National (Qatar) Priority Research Program (NPRP) project.*

Hoekman, S.K., **Han, Y.** 2018. Distributed Power from Waste Biomass. *For USDA Sun Grant Program.* September 2018.

Hoekman, S.K., **Han, Y.** 2016. Life-Cycle Energy, Water, and GHG Benefits of Residential Solar PV System in Nevada. *For NSF EPSCoR – Track 1 NEXUS: The Solar Energy-Water-Environment Nexus in Nevada Seed Grant –2015.* January 2017.

## Publications

Wang, X.L., Hoekman, S. K., **Han Y.**, Chow, J. C., Watson, J. G., Wu, X., Wu, Y., Dennis Schuetzle, D., Schuetzle, R. 2020. Potential emission reductions by converting agricultural residue biomass to synthetic fuels for vehicles and domestic cooking in China, *Particuology*, 49, 40-47

**Han, Y.**, Hoekman, S.K., Jena, U., Das, P. 2020. Use of Co-Solvents in Hydrothermal Liquefaction (HTL) of Microalgae. *Energies*, 13(1), 124

**Han, Y.**, Hoekman, S. K., Cui, Z., Jena, U., & Das, P. 2019. Hydrothermal liquefaction of marine microalgae biomass using co-solvents. *Algal Research*, 38, 101421

Hu X. F., **Han Y.**, Dong X. B. 2016. Observational Study on Aerosol over Shijiazhuang in a Haze Day (*in Chinese*). *Meteorological and Environmental Sciences*, **03**, 32-37

Hu X. F., **Han Y.** 2015. An Airplane Detection of Aerosol over the Middle-South of Hebei Province on Rainy Days (*in Chinese*). *Journal of Arid Meteorology*, **33(3)**, 490-496

**Han, Y.**, Zheng, Y. F., Wu, R. J., Yin, J. F., Sun, X. 2014. Nitrous Oxide Flux at the Water-Air Interface of the Rivers in Nanjing During Summer (*in Chinese*). *Environmental Science*, **35(1)**, 348-355

Sun, Y. W., **Han, Y.**, Sun, X., Liu, W. 2014. Statistical Analysis of Several Parameters of Hail and Precipitation Measurements over the Zhangjiakou Area (*in Chinese*). *Science Technology and Engineering*, **14(4)**, 12-17

Sun, X., Yin, Y., Sun, Y., Sun, Y., Liu, W., & **Han, Y.** 2013. Seasonal and vertical variations in aerosol distribution over Shijiazhuang, China. *Atmospheric Environment*, 81, 245-252

**Han, Y.**, Zheng, Y. F., Wu, R. J., Yin, J. F., Xu, J. X., Xu, P. 2013. Greenhouse gases emission characteristics of Nanjing typical waters in Spring (*in Chinese*). *China Environmental Science*, **33(8)**, 1360-1371

Sun, Y. W., **Han, Y.**, Sun, X., Yin, Y., Zhao, Z. J., Shi, A. Y., Jiang, Y., Qi, Z. H. 2012. Hail Shooting Type and Distribution of Correlation Factor (*in Chinese*). *Plateau Meteorology*, **31(1)**, 269-276

## Conference Presentations

**Han, Y.**, Hoekman, S.K., Jena, U., Das, P. 2019. Effects of Co-solvent on hydrothermal liquefaction of Marine Water Microalgae. *The 9<sup>th</sup> International Conference on Algal Biomass, Biofuels & Bioproducts*, Boulder, CO, 17-19 June 2019, *poster presentation.*

**Han, Y.**, Hoekman, S.K., Cui, Z., Jena, U., Das, P. 2018. Hydrothermal Liquefaction of Marine and Fresh Water Algal Biomass Using Co-solvents. *Fall 2018 Graduate Poster Symposium*, Reno, NV, 15 November 2018, *poster presentation*.

**Han, Y.**, Hoekman, S.K., Cui, Z., Jena, U., Das, P. 2018. Hydrothermal Liquefaction of Marine and Fresh Water Microalgae Using Co-solvents. *Algae Biomass Summit 2018*, Houston, TX, 14-17 October 2018, *poster presentation*.

Jena, U., **Han, Y.**, Cui, Z., Hoekman, S.K. 2018. Hydrothermal Co-solvent Processing of Marine Algae Biomass. *2018 ASABE Annual International Meeting*, Detroit, MI, July 29-August 1, 2018, *oral presentation*.

**Han, Y.**, Hoekman, S.K., Liu, X.W., Broch, A. 2016. Life Cycle Energy, Water, & GHG Benefits of Residential Solar PV Systems in Nevada. *DRI Graduate Student Poster Session*, Reno, NV, 18 April 2016, *poster presentation*.

## **Awards**

First Place Young Researcher Award in Algae Engineering at the *Algae Biomass Summit*, Houston TX, 2018

Third Place Award in UNR Graduate Student Association (GSA) 2018 Poster Symposium, 2018

## **Skills**

**Programming:** Python, R, MATLAB

**Software:** LabVIEW, Microsoft Word, Microsoft Excel, SPSS

**Instrumentation:** SRI/Agilent Gas Chromatograph; Fourier-transform infrared spectroscopy (FTIR); Proton nuclear magnetic resonance ( $^1\text{H}$  NMR); Calorimeter; GC/MS; Proximate (TGA) and ultimate (CHNO Analyzer) analysis

**General:** Instrumentation maintenance; Laboratory standard operating procedures (SOP); Safety operations guidelines of handling chemicals; soldering and electronics troubleshooting and repair; Design and operation of gas sampling systems; Administrative duties