Judy Jingwei XIE, Ph.D.

Email: judy.jw.xie@gmail.com | Linkedin: linkedin.com/in/judyjwxie | Personal Website: judyjwxie.github.io
Climate and Energy Policy Researcher | Chemical and Systems Engineer

EDUCATION

Imperial College London | London, UK
Ph.D. in Environmental Policy Research | President's PhD Scholar | Student Delegate to COP28 2024
Supervisors: Professor Joeri Rogelj and Dr. Iain Staffell
Thesis: "Just Transitions away from fossil fuels: quantitative insights into the procedural dynamics, drivers, and distributional impacts in power systems"

Georgia Institute of Technology | Atlanta, GA, USA
B.S. in Chemical & Biomolecular Engineering | Highest Honors and Honors Program Scholar 2019
Research Mentors: Dr. Nathan Ellebracht and Professor Christopher W. Jones
Research Project: "Understanding intramolecular cooperativity in acid-base silica-supported organocatalysts"

WORK EXPERIENCE

Georgia Institute of Technology | Atlanta, GA, USA
Postdoctoral Fellow | School of Chemical and Biomolecular Engineering Oct 2024 - Present
- Investigate future Direct Air Capture (DAC) cost reduction through analyzing historical technology change
- Model DAC integration with a renewable energy system and estimate corresponding community impacts
- Develop education materials for and engage with community members on equitable DAC deployment

Imperial College London | London, UK
Postgraduate Researcher | Centre for Environmental Policy & Grantham Institute Oct 2020 - Jul 2024
- Evaluated granular employment impacts of decarbonizing the US electricity system with optimization model scenarios
- Conducted machine-learning driven topic modeling on 20 annual United Nations (UN) climate change conferences
- Mapped the social networks and interest group dynamics behind energy transition discussions at the UN

International Institute for Applied Systems Analysis (IIASA) | Laxenburg, Austria
Young Summer Scientist Program & Guest Researcher | Energy, Climate, and Environment Program Jun 2023 - Jul 2024
- Gathered and investigated social, political, and institutional data as drivers for coal and gas phase-out globally
- Developed alternative narratives for fossil fuel phase-out in Integrated Assessment Model (IAM) scenarios
- Evaluated national and regional Nationally Determined Contribution (NDC) policy ambitions and their feasibilities

Global Thermostat | Atlanta, GA, USA (Direct Air Capture start-up acquired by Zero Carbon Systems in Brighton, CO)
Research Chemist Jul 2019 - Sep 2020
- Designed and conducted experiments to investigate mechanism of DAC sorbent degradation and improve its lifetime
- Developed internal standard operating procedures for material characterizations
- Collaborated with external manufacturers for the scale-up of advanced monolith and polymer materials
- Supported joint development agreements and resulted in project and budget expansion with external partner

Paul Scherrer Institut (PSI) | Villigen, Switzerland
Visiting Scientist | Bioenergy and Catalysis Laboratory May 2018 - Aug 2018
- Synthesized and tested novel catalysts in continuous-flow high-pressure reactors for lignocellulose hydrolysis
- Optimized biomass pre-treatment methods in biomass conversion resulting in a 4x yield increase

RESEARCH

Peer-Reviewed Articles

- **Xie, J.**; Escher, N. A.; Dunn, M. E.; Yu, Y.; Staffell, I.; Rogelj, J. Tracing inclusivity at UNFCCC conferences through side events and interest group dynamics. *Nature Climate Change.* 15, 270–278 (2025). DOI: 0.1038/s41558-025-02254-9
- **Xie, J.**; Martin, M.; Rogelj, J.; Staffell, I. Distributional labour challenges and opportunities of decarbonizing the US power system. *Nature Climate Change.* 13, 1203–1212 (2023). DOI: 10.1038/s41558-023-01802-5 ✦ Featured on the cover of the November 2023 Issue
- Nezam, I.*; **Xie, J.***; Golub, K. W.; Carneiro, J.; Olsen, K.; Ping, E. W.; Jones, C. W., Sakwa-Novak, M. A. Chemical Kinetics of the Autoxidation of Poly(ethylenimine) in CO2 Sorbents. *ACS Sustainable Chemistry & Engineering*, 9, 25, 8477–8486 (2021). DOI: 10.1021/acssuschemeng.1c01367 (*equal contribution)
- Scholz, D.; **Xie, J.**; Kröcher, O.; Vogel, F. Mechanochemistry-assisted hydrolysis of softwood over stable sulfonated carbon catalysts in a semi-batch process. *RSC Advances*, 9, 33525-33538 (2019). DOI: 10.1039/c9ra07668a
- **Xie, J.**; Ellebracht, N. C.; Jones, C. W. Inter- and Intramolecular Cooperativity Effects in Alkanolamine-Based Acid-Base Heterogeneous Organocatalysts. *ACS Omega*, 4, 1, 1110-1117 (2019). DOI: 10.1021/acsomega.8b02690

Book Chapters

- **Xie, J.**; Patrizio, P.; Mac Dowell, N. Modeling the Socio-Economic Impacts of Carbon Capture and Storage Deployment: Current Practices and Pathways Forward. In *Sustainable Carbon Capture: Technologies and Applications;* Suleman, H., Fosbøl, P. L., Nasir, R., Ameen, M. Taylor & Francis: Boca Raton, FL, USA, pp 323-339 (2022). DOI: 10.1201/9781003162780

Project Reports

- Brutschin, E.; **Xie, J.**; Nascimento L. Ex-post evaluation of climate policies and identification of barriers and milestones towards climate neutrality. Deliverable for Project ELEVATE: Enabling and Leveraging Climate Action Towards Net-Zero Emissions (2024).
- **Xie, J.**; Brutschin, E.; van Ruijven, B. Raising policy ambitions to reduce coal- and gas-fired power generation. Policy brief for Project ELEVATE (2024).

Works in Progress

- **Xie, J.**; Brutschin, E.; Rogelj, J.; Staffell, I. Past socio-political transition away from coal and gas show challenges and opportunities ahead. *Under Review at Environmental Research Letters.* Preprint at http://ssrn.com/abstract=4788002
- Brutschin, E.; Mintz-Woo, K.; Schinko, T.; **Xie, J.**; Zimm, C. Perceptions of justice impact the feasibility of climate mitigation options. *In Preparation.*

AWARDS & HONORS

- Imperial College London Faculty of Natural Sciences Dean's Fund (2023)
- Imperial College London President's PhD Scholarship (2020-2024)
- ThinkSwiss Research Scholarship (2018)
- Georgia Tech President's Undergraduate Research Award (2017, 2018)
- Georgia Tech UROP Outstanding Undergraduate Research Award in Chemical Engineering (2017-2018)
- Thomas L. Gossage International Enrichment Scholarship (2017-2018)
- Tau Beta Pi Engineering Honors Society (2017)

PRESENTATIONS

- 16th Integrated Assessment Modeling Consortium (IAMC) Annual Meeting - Oral Presentation (November 2023)
- 43rd International Association for Energy Economics International Conference - Oral Presentation (August 2022)
- ICL Centre for Environmental Policy PhD Student Symposium - Oral Presentation (June 2022) ✦2nd Place
- 3rd International Conference on Energy Research & Social Science - Poster (June 2022)

- Global Alliance of Universities on Climate (GAUC), Pathways to net zero emissions and carbon/climate neutrality, panel session on “Net zero and carbon neutrality in the United States and China” (June 2021)
- AIChE Annual Meeting Oral Presentation, Novel Nanostructured Catalytic Materials II (October 2018)
- AIChE Southern Regional Conference Paper (Oral) Competition (April 2018) ✦2nd Place
- AIChE Student Conference Poster Competition: Catalysis and Reaction Engineering (October 2017) ✦1st Place

SERVICE

Imperial College Union

Departmental Student Representative — Sep 2021 - Mar 2023

Intergovernmental Panel on Climate Change (IPCC) Working Group III

Internal Reviewer — Aug 2021

Reviewed reference materials in the Sixth Assessment Report (AR6) chapter on mitigation and development pathways in the near- to mid-term

Georgia Tech Student Alumni Association

President, VP Marketing, International Liaison — Mar 2016 - May 2019

Symposium Organization

Co-organizer, Imperial College President’s PhD Scholars Symposium — 2021, 2022

Co-organizer, Imperial College Centre for Environmental Policy PhD Symposium — 2022

Peer Review Renewable and Sustainable Energy Transition (2022), Joule (2023, 2024), Journal of Industrial Ecology (2024), Frontiers in Climate (2024), Communications Earth & Environment (2024)

Committee

Georgia Tech Climate Action Plan Implementation Committee: Research — 2024 - Present

Georgia Tech Institute Strategic Plan Working Group: Expand Globally — 2020

President/CEO Search Committee for the Georgia Tech Alumni Association (student representative) — 2019

OUTREACH

Grantham Institute Massive Open Online Course (MOOC) — 2021

Reviewed and contributed Just Transition content on "Why Move Towards Cleaner Power"

STEM in Action — 2021

Developed an online module on career outlooks in Energy and Sustainability aimed at young people aged 11-14

Georgia Tech Mentor Jackets — 2019 - Present

Mentor first-year undergraduate students and share career development advice

Letters to a pre-scientist — 2019

SKILLS

PROGRAMMING: Python, R, GAMS, LaTeX, MATLAB, Java

SOFTWARE: Anaconda, JupyterLab, QGIS, Origin, Gephi, Aspen Tech, Arduino, ImageJ, gPROMS, Mathematica

ECONOMICS: input-output tables, correlation analysis

SOCIAL SCIENCE: social network analysis, machine learning pre-trained topic modeling, qualitative research

ENERGY SYSTEM: electricity system optimization (capacity expansion) models, techno-economic analysis