Mr. Christopher James Wright

Columbia University

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cjwright4242@gmail.com

Education & Employment

Columbia University . . . . . New York, NY
Ph.D. Materials Science . . . . . *2016 - 2019*

- Adviser: Simon J. L. Billinge

National Synchrotron Light Source-II, Brookhaven National Laboratory Upton, NY
Visiting Scholar . . . . . *May 2015 - August 2015*

- pyIID: The Python Infinite Improbability Drive, Monte Carlo Searches of X-ray Scattering Derived Structures

The University of South Carolina, Columbia . . . . . Columbia, SC
M.S Chemical Engineering . . . . . *2014 - 2016*

- Adviser: Xiao-Dong Zhou
- Thesis: Solving Atomic Structures using Statistical Mechanical Searches on X-ray Scattering Derived Potential Energy Surfaces
- Website: https://github.com/CJ-Wright/Masters_Thesis/raw/master/thesis.pdf

National Synchrotron Light Source-II, Brookhaven National Laboratory Upton, NY
Software Engineer . . . . . *May 2014 - August 2014*

- pyXPD: prototype controls software for the x-ray powder diffraction beamline, 28-ID

National Synchrotron Light Source, Brookhaven National Laboratory . . Upton, NY
Science Undergraduate Laboratory Intern . . . . . *June 2012 - August 2012*

- Structural refinement of CdSe Nanoparticles

University of South Carolina . . . . . Columbia, SC
Research Experience for Undergraduates Researcher . . . . . *May 2011 - August 2011*

- Electrochemical Reduction of CO_2 via Copper Nanoparticles

Brown University . . . . . Providence, RI
Sc.B Chemical Physics . . . . . *2010 - 2014*

- Graduated with Honors in Chemical Physics
- Thesis: Catalyst Structure and Annealing Dynamics from the Pair Distribution Function: a basis for Rational Catalyst Design
- Graduated with 3.49 GPA

Awards, Grants & Honours

Electrochemical Society Outstanding Student Chapter 2016
Presidential Fellow (University of South Carolina) 2014-2016
NSLS/CFN User Meeting Student Poster Scholarship 2014-2015
IGERT Fellow (University of South Carolina) 2014-2016
National Synchrotron Light Source X7B General User Beamtime 2013-2014
American Chemical Society Undergraduate Award in Inorganic Chemistry 2014
Leallyn B. Clapp Outstandint Thesis in Chemical Physics Prize (Dept. of Chemistry, Brown) 2014
Elected to Sigma Xi 2014
Undergraduate Teaching and Research Award 2013
Junior Prize in Chemical Physics (Dept. of Chemistry, Brown) 2013
CRC Prize (Dept. of Chemistry, Brown) 2012
NSF REU Second Prize - oral presentation (Dept. of ChemE, University of South Carolina) 2012

Featured Publications

1. Christopher J. Wright and Xiao-Dong Zhou. "Computer Assisted Area Detector Masking". In: *Journal of Synchrotron Radiation* (Accepted)

2. Wenlei Zhu et al. "Monodisperse Au Nanoparticles for Selective Electrocatalytic Reduction of CO2 to CO.". In: *Journal of the American Chemical Society* 135.45 (Nov. 2013), pp. 16833–16836. ISSN: 1520-5126. DOI: 10.1021/ja409445p. URL: http://pubs.acs.org/doi/abs/10.1021/ja409445p

Research Experience

IGERT Fellow . . . . . The University of South Carolina, Columbia
Atomic Pair Distribution Function Analysis . . . . . *August 2014 - June 2016*

- Development of Monte Carlo simulations of atomic structures using x-ray scattering
- Refinement of Solid Oxide Fuel Cell structural dynamics

Undergraduate Research Assistant . . . . . Brown University, Sun Group
Nanoparticle synthesis, Electrochemistry, and Atomic Structure . . . . . *2012 - 2014*

- Studied the synthesis of gold nanoparticles for electrochemical reduction of CO_2 and their atomic structures

Summer Internship/Visiting Scientist, SULI . . . . . Brookhaven National Laboratory
National Synchrotron Light Source . . . . . *Summer 2012*

- Refined CdSe atomic structure using

Summer Internship/Visiting Scientist, REU . . . . . University of South Carolina
Department of Chemical Engineering . . . . . *Summer 2011*

- Synthesized Copper Nanoparticles for the electrochemical reduction of CO_2 to Fuels and Feedstock Chemicals

Major Software Projects

XPDAcq . . . . . Co-Lead Developer
Data acquisition, analysis and simulation for the XPD beamline . . . *September 2016 - present*

- Automated data reduction
- Detector Simulation
- Website: https://github.com/xpdAcq

Scikit-Beam . . . . . Developer
Data analysis tools for X-Ray, Neutron and Electron sciences . . . . . *May 2014 - present*

- Website: http://scikit-beam.github.io/scikit-beam/

pyIID . . . . . Lead Developer
Monte Carlo Based Diffraction Simulation . . . . . *May 2014 - present*

- X-ray Scattering and Atomic Pair Distribution Function Simulation
- Advanced GPU kernels for 10-100x speedup of scattering simulation
- Refine atomic structures from scattering using Hamiltonian Monte Carlo
- Website: https://github.com/CJ-Wright/pyIID

Sidewinder-Spec . . . . . Lead Developer
Sideloader from APS data to NSLS-II Database Stack . . . . . *Nov 2016 - present*

- Load data from the APS to the NSLS-II stack for easy analysis and provenience
- Website: https://github.com/CJ-Wright/sidewinder-spec

Graduate Publications

1. Christopher J. Wright and Xiao-Dong Zhou. "Computer Assisted Area Detector Masking". In: *Journal of Synchrotron Radiation* (Accepted)

2. Emir Dogdibegovic et al. "Electrochemical Performance and Durability of (Pr1-xNdx)2NiO4 As the Cathode for Solid Oxide Fuel Cells". In: *Meeting Abstracts* MA2016-01.28 (Apr. 2016), p. 1369. URL: http://ma.ecsdl.org/content/MA2016-01/28/1369.abstract

3. Pranav P. Sharma et al. "Nitrogen-Doped Carbon Nanotube Arrays for High-Efficiency Electrochemical Reduction of CO ¡sub¿2¡/sub¿ : On the Understanding of Defects, Defect Density, and Selectivity". In: *Angewandte Chemie* (2015), n/a–n/a. ISSN: 00448249. DOI: 10.1002/ange.201506062. URL: http://doi.wiley.com/10.1002/ange.201506062

Undergraduate Publications

1. Wenlei Zhu et al. "Monodisperse Au Nanoparticles for Selective Electrocatalytic Reduction of CO2 to CO.". In: *Journal of the American Chemical Society* 135.45 (Nov. 2013), pp. 16833–16836. ISSN: 1520-5126. DOI: 10.1021/ja409445p. URL: http://pubs.acs.org/doi/abs/10.1021/ja409445p

Presentations

1. Emir Dogdibegovic et al. "Electrochemical Performance and Durability of (Pr1-xNdx)2NiO4 As the Cathode for Solid Oxide Fuel Cells". In: *Meeting Abstracts* MA2016-01.28 (Apr. 2016), p. 1369. URL: http://ma.ecsdl.org/content/MA2016-01/28/1369.abstract

2. Christopher J Wright et al. "Phase Dependent Selectivity of Electrochemical CO2 Conversion to Fuels on TiO2 nanoparticles". In: *Meeting Abstracts* MA2015-01.25 (Apr. 2015), p. 1515. URL: http://ma.ecsdl.org/content/MA2015-01/25/1515.abstract

Posters

1. Emir Dogdibegovic, Christopher J Wright, and Xiao-Dong Zhou. "Quantification of Phase Evolution in Praseodymium Nickelates". In: *Meeting Abstracts* MA2016-01.41 (Apr. 2016), p. 2052. URL: http://ma.ecsdl.org/content/MA2016-01/41/2052.abstract

Outreach and Service

QSTEM . . . . . Columbia University
Outreach Coordinator and Treasurer *2016-Present*

- Mission of fostering a community of LGBTQ+ students pursuing STEM fields at Columbia University. Our club hopes to provide queer students and allies with social, professional, and educational resources and to improve their university experience by making Columbia University a more understanding, inclusive, and respectful place.
- Currently serving on the board of Columbia University QSTEM
- Organized seminars with distinguished scientists, with an emphasis on talks on diversity and LGBTQ+ issues in STEM

Enhanced Learning Experience . . . . . University of South Carolina
Lecturer *2016*

- Presented a lecture and laboratory on electochemistry and catalysis

Electrochemical Society Student Chapter . . . . . University of South Carolina
President *2015-2016*

- Organized seminars and outreach
- Chosen as an Outstanding Chapter for 2016

Science Fair . . . . . Dutch Fork High School
Judge *2015*

- Judged the chemistry section of the Dutch Fork High School science fair

Chemistry Department Undergraduate Group . . . . . Brown University
Co-Chair *2012-2014*

- Organized seminars with distinguished scientists, with an emphasis on researchers from underrepresented groups
- Produced annual chemistry demonstrations for the public
- Held social events for undergraduate chemists and chemistry faculty aimed at promoting undergraduate research
- Organized an panel of chemistry alumni to discuss their careers both inside and outside of academia

Brown Science Conference . . . . . Vartan Gregorian Elementary School
Brown-Yale CCI Presenter *2013*

- Developed and presented a demonstration and lecture on electrochemical water splitting, and associated pH changes, titled: "The Colorful Chemistry of Electricity"

"Chemistry: Believe it or Not" public chemistry demonstration . . Brown University
Master of Ceremonies and Organizer *2013*

- Organized, MC'd, and presented a night of chemistry demonstrations

A Day on College Hill . . . . . Brown University
Chemistry STEM Panelist *2012-2013*

- Discussed the Brown STEM program, especially the Chemical Physics program

"Night of Chemistry" public chemistry demonstration . . . . . Brown University
Presenter *2012*

- Prepared and presented demonstrations of guncotton, liquid nitrogen, and others
- Youtube video: https://www.youtube.com/watch?v=k8GxX7D2PI0

NSLS "Science Sunday" laboratory open house . . . . Brookhaven National Laboratory
Renewable Energy Presenter and Facility Tour Guide *2012-2014*

- Organized a renewable energy station with poster and solar powered cars and served as a tour guide of the NSLS and NSLS-II

Memberships

American Chemical Society . . . . . *2009 - present*
Member

Electrochemical Society . . . . . *2011 - 2016*
Member

American Physical Society . . . . . *2016 - present*
Member

Skills

- Programming Languages
  - **Expert:** Python
  - **Intermediate:** Lua, BASH, XONSH
- Markup Languages
  - **Expert:** LaTeX, markdown
- Specialized Software
  - **Expert:** Linux, NumPy, SciPy, MatPlotLib, Numba, Fit2D, pyFAI
  - **Intermediate:** MATLAB, MongoDB, TinyDB, SPEC, Mathematica, ORIGEN v2.2
- Experiments
  - **Expert:** X-ray Powder Diffraction, X-ray Total Scattering, Atomic Pair Distribution Function Analysis, In-situ/In-operando X-ray Scattering
  - **Intermediate:** Electrochemistry, Nanoparticle Synthesis, Electron Microscopy