

Christian Ahart

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Professional summary

I have recently passed my viva for a PhD in Condensed Matter and Materials Physics at University College London, under the supervision of Prof. Jochen Blumberger. The aim of my research was to better understand charge transport processes in materials through atomistic simulations.

Publications

1. Christian S. Ahart, Kevin M. Rosso and Jochen Blumberger. Implementation and validation of constrained density functional theory forces in the CP2K package. *Accepted*, 2022.
2. Christian S. Ahart, Kevin M. Rosso and Jochen Blumberger. Electron and Hole Mobilities in Bulk Hematite from Spin-Constrained Density Functional Theory. *J. Am. Chem. Soc.* 144, 4623–4632, 2022.
3. Christian S. Ahart, Jochen Blumberger and Kevin M. Rosso. Polaronic structure of excess electrons and holes for a series of bulk iron oxides. *Phys. Chem. Chem. Phys.* 22, 10699–10709, 2020.

Education

2018 - 2022 University College London, UK
PhD Condensed Matter and Materials Physics

Thesis: Charge transport in bulk hematite and at the hematite/water interface

The mobility for excess electrons and electron holes in bulk hematite was calculated using spin-constrained and gap-optimised hybrid density functional theory, with comparison to calculations of charge transport at the hematite/water interface.

2014 - 2018 University of Nottingham, UK
MSc. Chemistry and Molecular Physics (First class Honours)

Modules include:

- Scientific Computing
- Quantum Dynamics
- Solids, Interfaces and Surfaces
- Advanced Physical Chemistry

Master's project: Quantum mechanics of rotating electron nuclear spin systems

This project involved research into, and application of, theoretical and computational techniques to model nuclear magnetic resonance with dynamic nuclear polarisation.

2007 - 2014 William Howard School, Brampton, UK
A Levels: Mathematics (A), Physics (A), Chemistry (A), Biology AS (A)
GCSEs: 9 including Maths and English (A*-B)

Research/Teaching Experience

2018-2021 University College London, UK
Postgraduate Teaching Assistant

- Marked coursework for lecture courses and demonstrated in computer labs.
- Gained experience in a leadership role and working as part of a larger team.

- June - Aug 2017** Friedrich-Schiller-Universität Jena, Germany
Summer Research Student
- Gained acceptance onto a competitive research program coordinated by the German Academic Exchange Service (DAAD).
 - Supported research into coupled electron-nuclear motion for attosecond time-resolved lasing experiments.
 - Provided input to a Fortran code base and independently wrote Python code for scientific analysis.
- June - Aug 2016** Johns Hopkins University Centre for Talented Youth, Pennsylvania, USA
Chemistry Teaching Assistant
- Secured a position at a prestigious USA summer school for talented youths.
 - Supported the planning and delivery of lessons, workshops and laboratory work; progressed to leading all aspects.
- June - Aug 2015** Camp Marist, New Hampshire, USA
Camp Counsellor and Photographer
- Taught photography and video editing skills to children aged 9-16; progressed to leading classes.
 - Produced photographs to a high standard for use on the camp website, 2016 calendar and end of session slideshows.
- 8 - 10 July 2013** University of Exeter, Exeter, UK
Summer School
- Attended lectures on latest research developments within the Physics and Astronomy Department.
 - Visited undergraduate and research laboratories and took part in demonstrations.
- 22 - 26 June 2013** University of Lancaster, Lancaster, UK
Academic work experience
- Accepted onto a competitive, intensive work experience scheme.
 - Studied latest research developments within the Physics Department.
- Jan 2010 - Jan 2014** Bewcastle Scout Group, Bewcastle, UK
Young Leader
- Assisted and led activities for children aged 6-14, with a focus on Cubs aged 8-10.
 - Responsible for supervising Cubs during activities, including overnight camps.

Other Skills

- IT: Microsoft Office Suite, Adobe Creative Suite, LaTeX, LINUX.
- Programming: Fortran, Python, MATLAB.
- Bronze and Silver Duke of Edinburgh Awards.
- Full, clean driving licence (8 years).

Interests

- eSports: captain of a 5-member team within the Nottingham Gaming Society competing in National tournaments.
- Homebrew: member of the London Amateur Brewers, participate in homebrew competitions.
- Rock climbing.