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Education

King's College London October 2017–Present
EPSRC CASE PhD student in Theory and Simulation of Condensed Matter—3rd Year.
Sponsored by Rolls-Royce.
Atomistic investigation of stress-corrosion cracking and oxygen solute-hardening in titanium alloys.

Imperial College London September 2013–June 2017
MSci. Hons. Physics (2:1)
Computational Physics, Quantum Theory of Matter, Light and Matter, Solid State, Group Theory,
Foundations of Quantum Mechanics, Quantum Field Theory, Mathematical Methods.

Bolton School Boys' Division 2006–2013
A-levels: Physics (A*), Maths (A*), Further Maths (A*), Chemistry (A)
GCSE's: 6 A*s, 4 As

**Relevant
Experience**

Computational Physics PhD Student, October 2017–Present
King's College London
- Full-time PhD in computational condensed matter focussing on defects in alloys.
- Experienced with HPC: Archer, Thomas, SuperMUC, SKF Comlab.
- Manage group's computer cluster.
- Implemented a Bayesian Optimisation algorithm.
- Implemented anisotropic elasticity solutions with corrections for periodicity and plastic strain.
- Developed on Questaal code and performed DFT calculations of Ti and Ti_3Al.
- Developed in-house atomistic code for multi-scale modelling of defects in solids.
- Fit QM tight-binding d-band model for Ti using evolutionary algorithms.
- Investigating how oxygen-defect interactions modify plasticity of aerospace alloys and promote stress-corrosion cracking phenomena.

Research Consultant/Visiting Researcher, November 2019–Present
SKF Houten, The Netherlands
- Full-time research consultant for 4 months in R&D centre of world's largest bearing manufacturer.
- Heavily use the SKF supercomputer (Comlab), with Sun Grid Engine job scheduler.
- Current work on computational investigation of dislocation-assisted carbon migration.
- Tight-binding dislocation simulations coarse-grained into line-tension and kMC models.
- Dislocation velocities determined as a function of temperature, stress and carbon concentration from ab-initio model.
- Models used to elucidate mechanism for microstructural decay in bearing steel from rolling cycle fatigue.

Linux System Administrator, October 2019–Present
King's College London
- Manage Paxton group cluster of 10 nodes.
- Nodes configured with OpenSUSE and Slurm Workload Manager.
- Have additional experience configuring Sun Grid Engine and Torque.

TYC Materials Modelling Course, October 2018–February 2019
University College London
- Graduate course in materials modelling.
- Attended courses in DFT, MD, kMC, Thermodynamics, Fitting of forcefields and Surface simulations.

Physics by the Lake Summer School, July 30th–August 10th 2018
Cumberland Lodge
- 2-week gradaute summer school in condensed matter physics.
- Attended courses in Electrons in Solids, Statistical Mechanics, Strongly Correlated Quantum Systems, Cold Quantum Fluids, Quantum Information, Topological Physics.
- Hands-on DFT experience with Questaal code.

Undergraduate Research Opportunities Programme, July 2016–September 2016
Imperial College London
- 9-week, full-time research placement.
- Developed homoepitaxial growth model of GaAs with deposition and diffusion events using a Kinetic Monte Carlo algorithm.
- Extended model with the addition of another molecular species with differing properties.
- Analysed number of adatoms, island size and differences in crystal growth.

MSci Project, Imperial College London   October 2016–July 2017
- Developed cellular automaton model of non-linear, electrical wave dynamics in the heart which spontaneously give rise to Atrial Fibrillation.
- Extended model to work on more realistic 3D heart morphology to investigate new risk of atrial fibrillation given differences in geometry.

Computational Projects, Imperial College London   October 2013–December 2015
- Modelled silver spheres in resin to find the Critical threshold for conductivity.
- Optimised the design of a pion accelerator and detector to measure branching ratios.
- Investigated the properties and dynamics of solitons under the Kortweg De-Vries Equation.
- Simulated double pendula and investigated dynamics under varous finite difference methods.

Future Experience

Rolls-Royce Internship,   May 2020–August 2020
Rolls-Royce
- Full-time internship for 3 months at Rolls-Royce in Derby.
- 4 weeks with Modelling team.
- 3 weeks with the Materials Joining Group.
- 4 weeks with production.
- Work shadowing of Rolls-Royce senior fellow Professor David Rugg.

Additional Experience

Head of Research and Design,   October 2011–April 2012
EDT Engineering Education Scheme—Lancaster University & United Utilities
- Designed and created Silt Trap with a team of 5.
- Researched advanced concepts in Fluids and applied them.
- Used university facilities—flow tanks and meters to test and improve design.
- Member of multidisciplinary team to produce results within deadlines.
- Wrote report and presented solution to panel of Senior Engineers.

Work Shadowing of Technician, Quay Pharmaceuticals   Summer 2011
- Practical experience with laboratory equipment: High Performance Liquid Chromatography Machine.
- Measured specific properties of substances for analysis.
- Absorbed information quickly and efficiently to work within deadline.

Volunteering

Science Mentor, Ladybridge High School, Bolton   2011–2012
- Mentored pre-GCSE students struggling in the Sciences.

Mathematics Mentor, Bolton School Boys' Division   2011–2012
- Mentored students who have difficulties with Maths.

Young Leader, Bolton Lads and Girls Club   Spring 2012
- Supervised children and helped organise activities.

Vfifty award
- Over 50 hours of volunteering in one Academic year

Achievements

- NPIF award from EPSRC for research placement in the Netherlands.
- EPSRC bursary award for Undergraduate Research Opportunities Programme.
- Gold Crest Award for completion of Engineering Education Scheme.
- Mathematics Prize for best in A-levels.
- Duke of Edinburgh Silver: Sea Kayaking expedition with team of 4.
- Trinity Guildhall Classical Guitar Grades: 1, 2, 5 and 7.
- Vipassana 10-Day Meditation Course completion.

Skills

Programming Languages: Unix, Python, Julia, Fortran, AVR Assembler.
Software: Questaal, Lammps, Git, Emacs, LaTeX, Origin, Inkscape, Microsoft Office, Ableton.
Languages: Japanese (Level 1), Arabic (Level 1), Russian (GCSE)

Interests

- Dancing: Experienced in salsa, bachata, funk and breakdancing.
- Climbing: Attend 4 times a week. Organise trips.
- Gymnastics: Attend the gym 3 times a week.
- Classical Guitar
- Music Production
- Meditation

References

Available on request