Dr. Richard Rowan-Robinson
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Links

Professional Summary

- Ph.D. in Physics with an additional 4 years research experience: expert in data analysis and experiment design, with complementary project management and mentoring experience.
- Excellent problem solver with both hands-on practical and strong programming skills.
- Experienced collaborator having worked for projects comprising of 10 international partners.

Employment

The University of Sheffield, UK: Research Associate *June 2019 - present*
Topic: Design of new multi-component magnetic alloys. Research motivation: New magnetic materials for transformers, motors, generators and sensors.

- Extensive application of Python for the development of software tools, including: scripts to calculate the alloy composition variation across a sample, modules for efficient data analysis, and a GUI for automated image stitching of microscope images.
- Realised the potential of machine learning and taught myself the fundamentals of Data Science, implementing a regression model in Python to assist in alloy design. This included data sourcing and sanitisation, data visualisation, feature engineering and cross-validation of the model.
- Excellent literacy skills: selected as 1 of 4 candidates from the Faculty of Engineering to apply for the Royal Academy of Engineering Research Fellowship, obtaining letters of support from two industry partners for this application. Obtained a development grant from the Sheffield Engineering Researcher Society and have published numerous papers in peer-reviewed journals over my career.
- With the heavily delayed arrival of key equipment for sample fabrication, demonstrated adaptability by establishing a new collaboration with Loughborough University to fabricate the samples.
- Recommissioned a sophisticated thin film deposition system, including liaising with the mechanical workshop for the design of custom components.

Uppsala University, Sweden: Research Associate *Jan 2017 - June 2019*
Topic: Design of magnetic nanostructures with high optical activity. Research motivation: New materials with potential applications for hard-disk magnetic recording media.

- Worked for a €3.7M EU funded project, consisting of nine European universities and an industrial partner. Contributed to collaborative project reports and presented results at review meetings. Communicated patent potential results to non-experts within our industrial partner's organisation.
- Demonstrated capacity as an independent researcher: managing multiple research projects, pitching my own research ideas, mentoring and training PhD students.
- Was the lead nano-fabrication specialist, developing processes for fabrication of a variety of nanostructured samples using tools such as electron-beam lithography within a clean room.
- Wrote user facing software using Labview for the control of instruments and running experiments.

University of Nottingham, UK: Research Associate *June 2016 - Jan 2017*
Project: Investigation of hybrid piezoelectric-ferromagnetic materials. Research motivation: Using strain to control magnetisation for new low power magnetic recording technologies.

- Project was in partnership with the University of Leeds, requiring good organisation when coordinating measurements and managing my time between both universities. Had to quickly become an expert on piezoelectric materials and the optical phenomena specific to them.

- Imaging the magnetisation in samples using optical microscopy and automating the image analysis using Python, pinpointing boundary regions of magnetic contrast. Included writing methods to threshold and normalise images as well as perform background subtraction and drift corrections.

Education

Durham University, UK: PhD degree *Sept 2012 - June 2016*
Project: Physical phenomena in magnetic thin films. Research motivation: Investigating magnetism in nanometric thickness films and the role of layer interfaces. Thesis: http://etheses.dur.ac.uk/11692

- Designed an experiment setup which measured both magneto-optical and magneto-electrical effects. Developed control software and measurement hardware as well as calibrating components.
- Involved in the teaching and assessment of laboratory skills for third year undergraduate students. Also gave presentations and guided tours to prospective students at open days for the University.
- Developed and expanded on a theoretical model of electrical transport in magnetic thin-films.

University of Leeds, UK: MPhys degree: *first-class* honours. *Sept 2008 - June 2012*
September 2011 - 2012: Masters project - Electrical measurements of magnetic micro-devices under magnetic fields at cryogenic temperatures.

Summer 2011: EPSRC funded 10 week research placement at the University of Leeds refining processes to deposit magnetic films with specified magnetic properties.

Summer 2010: Nuffield Foundation funded 8 week research placement at the University of Leeds investigating the electrical properties of carbon nanotubes.

Technical skills

Skill	Usage
Python, Matlab	Data analysis, modelling and visualisation, image analysis, machine learning.
SQL	Completed an introductory SQL minicourse.
Arduino	Programming micro-controllers to drive components using the Arduino IDE.
LaTeX	Professionally compiling and formatting documents.
Labview	Producing GUI software for communicating and controlling instruments.
COMSOL multiphysics	Finite-element modelling of scattered light from nanostructures.
Autodesk Fusion 360	Computer aided design of components to be machined or 3D printed.
Instrument design	Design of experimental systems exploiting physical phenomena to realise measurements to solve problems.
Experimental techniques	Use of complex equipment and techniques for sample characterisation and understanding physical phenomena, e.g. X-ray scattering, electron microscopy.
Thin film and nano-fabrication	Developing methodologies/processes for fabricating nanometric thickness metallic films and arrays of nanostructures.
Soldering and assembly	Electronics, building circuits, programming micro-controllers.

Personal interests

- Folk music: As a student I established the Leeds University Folk music society, which is still thriving today. Have performed at Warwick Folk Festival, which receives approximately 30,000 attendees.
- Fell running and trekking. Completed the Manaslu circuit in Nepal (crossing the Larkya La pass at 5106 m above sea level), the Tour du Mont Blanc and the Walker's Haute Route in the Alps.
- Hobbyist maker: Currently building a spin-coating device using an Arduino microcontroller to control a quadcopter brushless motor.