

Ross Knapman

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Personal Information

Date of Birth 15th July 1997
Place of Birth Northallerton, United Kingdom
Nationality British
Last Updated October 2022

Education

2019–Present **PhD**, *Johannes Gutenberg-Universität Mainz*, Mainz, Germany.
Preliminary Title: Creation of Topological Magnetic Structures by Electrical Means.
Primary Supervisor: Prof. Dr. Karin Everschor-Sitte.
Secondary Supervisor: Prof. Dr. Jairo Sinova.

2015–2019 **Master of Physics**, *Durham University*, Durham, United Kingdom, *First Class Honours* (best possible grade).
Master's Project: Micromagnetic Simulations of Antiskyrmions.
Master's Project Supervisor: Prof. Peter Hatton.

2013–2015 **A Levels**, *Paston Sixth Form College*, North Walsham, United Kingdom, *A*A*A*Aaa*.
Physics, Chemistry, Mathematics, Further Mathematics, AS Biology, AS Critical Thinking.

2011–2013 **GCSEs**, *Broadland High School*, Hoveton, United Kingdom, *7A**, *3A*.

Experience

Work Experience

07/2018–08/2018 **Computational Condensed Matter Physics Internship**, *Durham University*, Durham, United Kingdom.
Undertook a computational project under the supervision of Prof. Tom Lancaster, investigating the magnetic fields experienced by muons when embedded in skyrmion-like spin textures. The bulk of this was the development of a Python module in C++ to aid in quickly investigating various dipole moment structures.

06/2017–09/2017 **DAAD RISE Research Internship**, *German Aerospace Center (DLR) Oberpfaffenhofen*, Weßling near Munich, Germany.
A highly competitive research placement funded by the DAAD, working as part of a small team developing a lidar system to detect atmospheric turbulence from aircraft. The work involved ground-based measurements and data analysis. Supervised by Dr. Jonas Herbst and Dr. Patrick Vrancken.

06/2016–08/2016 **Galaxy Survey Visualisation Internship**, *University of Queensland*, Brisbane, Australia.

Production of virtual reality mobile apps to visualise galaxy redshift surveys. Worked primarily with C#, and participated in discussions with researchers in cosmology. Supervised by Dr. Ed Macaulay.

07/2014 **Work Experience in Post-Processing**, *Met Office*, Exeter, United Kingdom.

Week-long work experience placement tasked with analysis of data using IDL, as well as teamworking activities.

10/2013–01/2014 **Work Experience**, *John Innes Centre*, Norwich, United Kingdom.

Undertook weekly half-day work experience sessions, assisting with experiments and discussing ongoing research with experts in plant and microbial science, and genomics.

University Societies

2018–19 **Co-President**, *Durham University Physics Society*.

2018–19 **Secretary**, *Durham University Astronomical Society*.

2017–18 **Treasurer**, *Durham University Astronomical Society*.

2016–18 **Publicity Officer**, *Durham University Physics Society*.

2016–17 **Webmaster**, *Durham University Astronomical Society*.

Awards

September 2021 **Third Place, IOP Publishing Emerging Leader Celebration 2021.**

Awarded for my poster showing results from our work proposing a protocol to create H-shaped skyrmions, held on Twitter.

May 2021 **Studienstiftung des deutschen Volkes Doctoral Scholarship.**

Doctoral scholarship given to students "who, because of their exceptional academic or artistic talents and personal qualities, can be expected to make an outstanding contribution to society as a whole". In addition to funding living expenses, the programme offers many opportunities for students to build their skills and network.

Jul 2019 **Florence Nightingale Prize for Graphical Excellence.**

Prize worth £100, given to one student in each year group per year at Durham University. Awarded for excellence in the illustration of antiskyrmion resonance modes in my Level 4 project report.

Apr 2017 **DAAD RISE Scholarship.**

The Research Internships in Science and Engineering (RISE) scholarship awarded by the DAAD is a prestigious scholarship that funds research placements in Germany, including living expenses, a travel allowance, and a conference in Heidelberg.

Feb 2015 **Silver in 2015 UK Chemistry Olympiad.**

Nov 2014 **Silver in 2014 UKMT Senior Mathematical Challenge.**

Sep 2013 **Sir William Paston Scholarship.**

Scholarship awarded by The Paston College Foundation worth £500 in recognition of outstanding GCSE results.

Teaching

Supervision

March–May 2022 **Timon Tausendpfund**, Bachelor Thesis "From Skyrmions to Hopfions".

Courses

- WS 2020–21 **Tutor**, *Experimental Physics 5c (Condensed Matter Physics)*, Prof. Jure Demsar.
- SS 2020 **Senior Assistant**, *Mathematical Calculation Methods*, Prof. Dr. Jairo Sinova and Dr. Karin Everschor-Sitte.
- WS 2019–20 **Tutor**, *Experimental Physics 5a (Atomic and Quantum Physics)*, Prof. Randolf Pohl.

Publications

Journal of Physics D: Applied Physics **54**, 404003, *R. Knapman, D. R. Rodrigues, J. Masell, and K. Everschor-Sitte.*

Current-induced H-shaped-skyrmion creation and their dynamics in the helical phase

Physical Review Applied **16**, 014020, *D. R. Rodrigues, J. Nothhelfer, M. Mohseni, R. Knapman, P. Pirro, and K. Everschor-Sitte.*

Nonlinear Dynamics of Topological Ferromagnetic Textures for Frequency Multiplication

Workshops, Schools, and Conferences Attended

- September 2022 **DPG Meeting of the Condensed Matter Section, Regensburg, Germany.**
Talk: Current-Induced H-Shaped Skyrmion Creation and Their Dynamics in the Helical Phase.
- March 2022 **Studienstiftung Natur- und Ingenieurwissenschaftliches Kolleg IX, Weimar, Germany.**
First week of a four-phase workshop over the course of a year and a half. Gave a talk on reservoir computing in this first workshop, will work on a reservoir computing project in subsequent workshops.
- November 2021 **Studienstiftung Herbstforum Gesellschaft & Natur 2021 für Promovierende, Online.**
Talk: Tying Knots in Magnets: Investigating Skyrmions and Hopfions.
- October 2021 **Joint School on Spin Physics (JSSP), Apolda, Germany.**
Poster Contribution: Current-Induced H-Shaped Skyrmion Creation and Their Dynamics in the Helical Phase.
- October 2021 **Parallel Programming Workshop (MPI, OpenMP and Advanced Topics), Online.**
Five-day workshop on parallel computing using MPI and OpenMP.
- September–October 2021 **DPG Meeting of the Condensed Matter Section, Online.**
Talk: Current-Induced H-Shaped Skyrmion Creation and Their Dynamics in the Helical Phase.
- July 2021 **Deep Learning and Acceleration with OpenACC on Nvidia GPUs, Online.**
Four-day workshop covering the fundamentals of deep learning, using Horovod to distribute deep learning over multiple GPUs, as well as using OpenACC to accelerate C/C++ code on GPUs.
- June 2021 **Vom Defizit zum Dialog: Einführung in die Wissenschaftskommunikation, Online.**
Two-day Studienstiftung workshop on scientific communication with the public including lectures and group activities.

- March–April **Do Research Like a Munchkin**, *Online*.
 2021 Workshop on Agile software development and clean code, with emphasis on applying these concepts to the broader topic of research, not necessarily just in software development.
- February **Exciting Dynamics: How Electrons, Spins, and Phonons Interact**, *Online*.
 2021 Poster Contribution: On-Demand Production of 3D Magnetic Textures by Electrical Means.
- September–October **2020 European School on Magnetism**, *Online*.
 2020 Series of lectures on various topics within magnetism.
- September **How to Shape Your Future: Career Planning for PhD Students, PhDs and Postdocs**, *Online*.
 2020 Career planning workshop aimed primarily at early career researchers.
- September **Intercultural Communication**, *Online*.
 2020 Workshop by Alexia Petersen on overcoming the challenges faced during cross-cultural communication and the reasons behind such challenges.
- December **British-German WE-Heraeus-Seminar: Skyrmions in Magnetic Materials**, *Bad Honnef, Germany*.
 2019 Poster Contribution: Production of Magnetic Textures in Different Dimensions.

Skills

Language Skills

English	Native
German	Conversational Knowledge <i>Self-Taught & 6 Months' B2 (Upper Intermediate) Lessons</i>
French	Elementary Knowledge <i>GCSE Grade A, Subsequent Self-Learning</i>

Computer Skills

Programming	Python (very good), Shell (very good), C++ (fair), Java (fair), C# (fair).
OS	GNU/Linux (Arch, Ubuntu, very good), macOS (very good), Windows (fair).
Simulation	MuMax ³ (very good), OOMMF (fair).
Calculation	Microsoft Excel (very good), Mathematica (fair).
Graphics	ParaView (very good), Blender (good), Inkscape (good), Processing (good).
Documents	L ^A T _E X (very good), Microsoft Word (very good).
Presentation	Keynote (very good), Microsoft PowerPoint (very good), reveal.js (good).