Ross Knapman

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Personal Information

Date of Birth	15th July 1997
Place of Birth	Northallerton, United Kingdom
Nationality	British
Last Updated	November 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*Aa*.
Physics, Chemistry, Mathematics, Further Mathematics, AS Biology, AS Critical Thinking.

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

Experience

Work Experience

08/2022–Present **Research Associate**, *Universität Duisburg-Essen*, Duisburg, Germany.
Continuing work with the TWIST Group, now based at the Universität Duisburg-Essen. Primarily involves the modelling of magnetic skyrmions using analytical and numerical methods.

07/2022–08/2022 **Research Stay in the Group of Ran Cheng**, *University of California, Riverside*, Riverside, CA, United States.
Worked on a (still ongoing) project investigating magnetic skyrmions in the path integral formalism.

08/2019–07/2022 **Research Associate**, *Johannes Gutenberg-Universität Mainz*, Mainz, Germany.
Carried out research activities in the frame of my doctoral work with the TWIST Group led by Prof. Dr. Karin Everschor-Sitte, as well as the INSPIRE Group, led by Prof. Dr. Jairo Sinova.

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 Promvierende**, *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 2021 **Do Research Like a Munchkin**, *Online*.
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 2021 **Exciting Dynamics: How Electrons, Spins, and Phonons Interact**, *Online*.
Poster Contribution: On-Demand Production of 3D Magnetic Textures by Electrical Means.

September–October 2020 **2020 European School on Magnetism**, *Online*.
Series of lectures on various topics within magnetism.

September 2020 **How to Shape Your Future: Career Planning for PhD Students, PhDs and Postdocs**, *Online*.
Career planning workshop aimed primarily at early career researchers.

September 2020 **Intercultural Communication**, *Online*.
Workshop by Alexia Petersen on overcoming the challenges faced during cross-cultural communication and the reasons behind such challenges.

December 2019 **British-German WE-Heraeus-Seminar: Skyrmions in Magnetic Materials**, *Bad Honnef, Germany*.
Poster Contribution: Production of Magnetic Textures in Different Dimensions.

Skills

Language Skills

English Native

German Conversational Knowledge *Self-Taught & 6 Months' B2 (Upper Intermediate) Lessons*

French Elementary Knowledge *GCSE Grade A, Subsequent Self-Learning*

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 LaTeX (very good), Microsoft Word (very good).

Presentation	Keynote (very good), Microsoft PowerPoint (very good), reveal.js (good).