



Sandra Chulliparambil Shaju

Personal Information

Date of Birth : 10 November 1999
Nationality : India
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Scientific Interests

- Magnetic spin structures: Magnetic hopfions, Magnetic skyrmions, Screw dislocations
- Micromagnetic simulations, Effective models
- Three-dimensional nanomagnetism

Education

- 2022-Present **Ph. D. Candidate**, *University of Duisburg-Essen, Germany*
Working Title: Exploring three-dimensional magnetic textures: hopfions and screw dislocations in chiral magnets
Supervisor: Prof. Dr. Karin Everschor-Sitte
- 2020-2022 **M. Sc. Physics**, *Cochin University of Science and Technology, Cochin, India*,
CGPA: 9.2/10
Master Thesis: Non-DMI stabilization of skyrmions in NiMnGa nanocaps
Supervisor: Prof. Dr. Senoy Thomas
- 2017-2020 **B. Sc. Physics**, *St. Thomas College (Autonomous), Thrissur, Kerala, India*, (Calicut University)
CGPA: 5.92/6
Bachelor Thesis: Investigation on structural and spectroscopic properties of Selenium doped Silica in the presence of Copper ion
Supervisor: Prof. Dr. Ann Mary
- 2015-2017 **Higher Secondary School**, *Government Higher Secondary School, Nandikkara, Kerala, India*, (Higher Secondary Board of Education, Kerala, India)
Grade: A+ (90% and above)

Internships

- 05/2023-06/2023 **Research Stay in the group of Prof. Dr. Stefan Blügel**, *Peter Grünberg Institute – Quantum Theory of Materials (PGI-1/IAS-1) of Forschungszentrum Jülich GmbH*
- Acquisition of basic knowledge regarding methods for calculating the lifetimes of magnetic structures: e.g. Geodesic Nudged Elastic Band (GNEB)

- Familiarization with the usage and application of the “Spirit” code through its graphical user interface as well as the Python API
- 09/2020-12/2020 **Coding instructor at “Whitehat Jr”**, *Live 1:1 online coding classes for kids*
 - Fundamentals of coding - logic, structure, sequence, and algorithmic thinking
- 04/2019-05/2019 **Internship at “Videon Industries”**, *Thrissur, India*
 - Hands-on experience in assembling voltage stabilizers within a team setting

Awards

- **First Rank** in M.Sc. Physics (2020-2022), Cochin University of Science and Technology, Kerala, India
- **First Prize** in Dr. Annie Joseph Vallamattom Memorial State Level Project Presentation Competition organized by the Department of Physics and Centre for Research, St.Teresa's College (Autonomous), Ernakulam, India
- **INSPIRE Scholarship**, A scholarship constituted by the Department of Science and Technology (DST), Government of India, (Awarded to the students who score aggregate marks within top 1% in their Higher Secondary School examination, to pursue courses in Natural and Basic Sciences at the B.Sc. and M.Sc. level)
- **Sanskrit Scholarship** by Government of Kerala, (Awarded to 10th grade students who secure more than 90% in an examination conducted at the state level)
- **Best Student Award(2014 & 2015)** Presented to the student who has consistently demonstrated a notable achievement both academically and in extracurricular activities at the school level

Publications

3D Magnetic Textures with Mixed Topology: Unlocking the Tunable Hopf Index
 , M. Azhar, S. C. Shaju, R. Knapman, A. Pignedoli, K. Everschor-Sitte
 arXiv:2411.06929

Workshops, Schools and Conferences attended

- 03/2025 **DPG Meeting of the Condensed Matter Section**, *Regensburg, Germany*
 Poster Presentation: Sliding Through Topology: Unlocking the Tunable Hopf Index
 Duration: 7 days
- 04/2024 **Workshop on “Nanomagnetism in 3D”**, *Ingelheim, Germany*
 Poster Presentation: Stabilization of Magnetic Hopfions in Bulk Magnets
 Duration: 3 days
- 03/2024 **DPG Meeting of the Condensed Matter Section**, *Berlin, Germany*
 Poster Presentation: Stabilization of Magnetic Hopfions in Bulk Magnets
 Duration: 7 days
- 12/2023 **PETASPIN 2023 School on “Spintronics: Fundamentals and Applications” - II edition**, *Messina, Italy*
 Recorded talk: Magnetic Hopfions
 Duration: 3 days
- 09/2023 **European School on Magnetism**, *Madrid, Spain*
 Poster Presentation: Magnetic Hopfions in Frustrated Magnets
 Duration: 14 days

03/2023 **DPG Meeting of the Condensed Matter Section, Dresden, Germany**
Poster Presentation: Magnetic Hopfions in Frustrated Magnets
Duration: 7 days

Soft Skill Workshops

- 10/2023 **Workshop on “Academic Writing”**, *Workshop organized by GC Plus, University of Duisburg-Essen, Germany*
Duration: Half day
- 08/2023 **Workshop on “Self-, Time- and Project-Management – Personal Development for reaching more in less time”**, *Workshop organized by Centre for Nanointegration (CENIDE), University of Duisburg-Essen, Germany*
Duration: 1 day
- 08/2023 **Workshop on “Leading discussions in small and large groups”**, *Workshop organized by the team for Equal Opportunities of the Faculty of Physics as part of Soft Skill Summer 2023, University of Duisburg-Essen, Germany*
Duration: 1 day
- 08/2023 **Workshop on “Women and Career”**, *Workshop organized by the team for Equal Opportunities of the Faculty of Physics as part of Soft Skill Summer 2023, University of Duisburg-Essen, Germany*
Duration: 1 day

Teaching Activities

- SS 2025 **Course Co-Organizer**, *Analytical Mechanics (Theory II)*, Prof. Dr. Karin Everschor-Sitte, University of Duisburg-Essen, Germany
- WS 2024 **Tutor**, *Newtonian Mechanics and Special Relativity (Theory I)*, Prof. Dr. Karin Everschor-Sitte, University of Duisburg-Essen, Germany
- SS 2024 **Tutor**, *Atomic and Molecular Physics, Quantum Phenomena (Exp. IV)*, Prof. Dr. Martin Mittendorf, University of Duisburg-Essen, Germany
- WS 2023 **Tutor**, *Statistical Physics (Theory V)*, Prof. Dr. Karin Everschor-Sitte, University of Duisburg-Essen, Germany

Skills

Programming

- Matlab ● ● ● ● ○
- Python ● ● ● ○ ○

Scientific Software and Graphics

- Mumax3 ● ● ● ● ●
- Paraview ● ● ● ● ●
- Netgen ● ● ● ● ○
- Nmag ● ● ● ● ○
- Origin ● ● ● ● ○
- Latex ● ● ● ● ○
- Spirit ● ● ● ○ ○

Operating Systems

- Windows ● ● ● ● ●
- macOS ● ● ● ● ○

Languages

- Malayalam ● ● ● ● ●
- English ● ● ● ● ●
- Hindi ● ● ● ● ○