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UNIVERSITET

PhD student in Nanomagnetism with a focus on neuromorphic applications

2026-05-07

Are you interested in working with simulations and method development at the intersection of physics and AI, with the support of competent and friendly colleagues in an international environment? Are you looking for an employer that invests in sustainable employeeship and offers safe, favourable working conditions? We welcome you to apply for a PhD position in Nanomagnetism with a focus on neuromorphic applications at Uppsala University.

The Department of Physics and Astronomy is located in the Ångström Laboratory and employs nearly 400 people, around 100 of whom are doctoral students. It offers a broad physics curriculum to undergraduate and graduate students, participation in nationally and internationally leading projects for researchers, and opportunities for partnership with industry and various outreach activities. Read more on https://www.uu.se/physics. (https://www.uu.se/en/department/physics-and-astronomy)

The Division of Materials Theory conducts world-class research in theoretical materials science and condensed matter theory, with a focus on both the development and application of advanced numerical and analytical methods. Research at the division includes, among other areas, magnetism and magnetic phenomena, electronic structure of materials, materials for green energy, correlated systems, superconductivity, and quantum information. The division is organized into two research programs: Materials Theory and Quantum Matter Theory. Together, these programs form a very dynamic and creative research environment consisting of around 70 active researchers.

Duties

We are seeking a motivated and ambitious PhD student in

theoretical and numerical nanomagnetism, with a focus on simulations of materials that can exhibit neuromorphic behavior. The work involves the use and development of advanced computational methods, such as atomistic spin dynamics (ASD) and electronic structure theory (DFT).

The aim of the project is to predict new materials and geometries for neuromorphic computing using realistic and physically well-founded models, where physical phenomena that mimic the information-processing mechanisms of the human brain are exploited. Such systems have the potential to enable energy-efficient computations and optimizations for future AI-like applications.

A central part of the project consists of method development, in which existing simulation techniques are further developed using machine-learning algorithms to enable more efficient, scalable, and realistic simulations and material predictions.

The project is part of a larger research initiative involving collaborations between research groups at Uppsala University, KTH Royal Institute of Technology, and Örebro University. Within this initiative, expertise in artificial intelligence, machine learning, theoretical magnetism, and electronic structure theory is brought together with the aim of identifying new magnetic neuromorphic phenomena and applications. Project webpage: https://wise-materials.org/project/brain-inspired-ai-design. (https://wise-materials.org/project/brain-inspired-ai-design-of-topological-magnets-for-sustainable-computing-2/)

This recruitment is connected to the Wallenberg Initiative Materials Science for Sustainability (WISE, wise-materials.org). WISE, funded by the Knut and Alice Wallenberg Foundation, is the largest-ever investment in materials science in Sweden and encompasses major efforts at Sweden's foremost universities over the course of 12 years. The vision is a sustainable future through materials science. Read more: https://wise-materials.org. (https://wise-materials.org/)

All early-stage researchers recruited into the WISE program will be a part of the WISE Research School https://wise-materials.org/research-school/ (https://wise-materials.org/research-school/), an ambitious nationwide program of seminars, courses, research visits, and other activities to promote a strong multi-disciplinary and international network between PhD students, postdocs, researchers, and industry.

The PhD position is fully funded and limited to four years of full-time studies. The PhD student is expected to primarily devote their time to their own doctoral education, including

research and coursework. Other duties at the department, such as teaching and administrative work, may be included within the scope of the position (up to a maximum of 20%), in which case the total duration of the employment will be extended accordingly.

Requirements

To meet the entry requirements for doctoral studies, you must

- hold a Master's (second-cycle) degree in physics or material science, or
- have completed at least 240 credits in higher education, with at least 60 credits at Master's level including an independent project worth at least 15 credits, or
- have acquired substantially equivalent knowledge in some other way.

A requirement for the position is very good proficiency in English, both spoken and written, as well as the ability to work both independently and in collaboration with others. In addition, the applicant's personal qualities, experience, and qualifications must, taken together, be assessed as providing good prerequisites for pursuing and completing doctoral studies at a high academic level.

Additional qualifications

A strong interest in the relevant research field, as well as scientific curiosity and creativity in approaching complex research problems, is desirable. Experience in programming and numerical simulations, as well as interest in or experience with machine learning and other AI-based methods, is considered meritorious. Experience in electronic structure calculations and magnetic simulations, for example based on DFT, Monte Carlo methods, or atomistic spin dynamics, is also considered an advantage.

Rules governing PhD students are set out in the Higher Education Ordinance chapter 5, §§ 1–7 and in Uppsala University's rules and guidelines. (https://www.uu.se/medarbetare/organisation-styrning/regler/)

About the employment

The employment is a temporary position according to the Higher Education Ordinance chapter 5 § 7. Scope of employment 100 %. Starting date as agreed. Placement: Uppsala.

For further information about the position, please contact: Dr.

Anders Bergman, anders.bergman@physics.uu.se, +46 793 477 420, or Dr. Maryna Pankratova, maryna.pankratova@physics.uu.se.

In this recruitment we have replaced the cover letter with questions that you are asked to answer when making your application. The answers will be used as a part of the selection process. The application must also include a CV (max. 2 pages) and copies of relevant grades. Please also attach a copy of the master's thesis (completed or draft). Contact details for a reference person for a letter of recommendation must also be included in the application.

Please submit your application by 29 May 2026, UFV-PA 2026/1498.

Are you considering moving to Sweden to work at Uppsala University? Find out more about what it´s like to work and live in Sweden. (https://www.uu.se/en/about-uu/join-us/why-choose-sweden)

Uppsala University is a broad research university with a strong international position. The ultimate goal is to conduct education and research of the highest quality and relevance to make a difference in society. Our most important asset is all of our 7,600 employees and 53,000 students who, with curiosity and commitment, make Uppsala University one of Sweden's most exciting workplaces.

Read more about our benefits and what it is like to work at Uppsala University https://uu.se/om-uu/jobba-hos-oss/ (https://uu.se/om-uu/jobba-hos-oss/)

The position may be subject to security vetting. If security vetting is conducted, the applicant must pass the vetting process to be eligible for employment.

Please do not send offers of recruitment or advertising services.

Submit your application through Uppsala University's recruitment system.

Placement:	Department of Physics and Astronomy
Scope:	Full time
Working hours:	100%
Type of employment:	Temporary position
Pay:	Fast lön
Number of positions:	1