

Postdoctoral Researcher on Theory of Optical Control of  
Van der Waals Quantum Magnets and Multiferroics  
Aalto University

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Posted Jun. 28, 2024, set to expire Dec. 30, 2024

**Job Title** Postdoctoral Researcher on Theory of Optical Control of Van  
der Waals Quantum Magnets and Multiferroics

**Department** T304 Dept. Applied Physics

**Institution** Aalto University  
, , Finland

**Date Posted** Jun. 28, 2024

**Application Deadline** Open until filled

**Position Start Date** Available immediately

**Job Categories** Post-Doc

**Academic Field(s)** Physics - General

**Job Website** [https://aalto.wd3.myworkdayjobs.com/aalto/job/Kide/Postdoctoral-Researcher-on-Theory-of-Optical-Control-of-Van-der-Waals-Quantum-Magnets-and-Multiferroics\\_R40175](https://aalto.wd3.myworkdayjobs.com/aalto/job/Kide/Postdoctoral-Researcher-on-Theory-of-Optical-Control-of-Van-der-Waals-Quantum-Magnets-and-Multiferroics_R40175)

**Apply By Email**

**Job Description**

Aalto University is where science and art meet technology and business. We shape a sustainable future by making research breakthroughs in and across our disciplines, sparking the game changers of tomorrow and creating novel solutions to major global challenges. Our community is made up of 13 000 students, 400 professors and close to 4 500 other faculty and staff working on our dynamic campus in Espoo, Greater Helsinki, Finland. Diversity is part of who we are, and we actively work to ensure our community's diversity and inclusiveness. This is why we warmly encourage qualified candidates from all backgrounds to join our community.

At the Department of Applied Physics, our pioneering research in physical sciences creates important industrial applications that hold great technological potential. Our research focuses on Materials physics, Quantum technology, Soft & living matter, and Advanced energy solutions. Topics extend

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from fundamental research to important applications. We educate future generations of research and development professionals, data specialists, technology experts, inventors, and scientists for industry and society.

The Department of Applied Physics is now looking for a

Postdoctoral Researcher on Theory of Optical Control of Van der Waals Quantum Magnets and Multiferroics

We invite applications for a two-year postdoctoral position in the field of theoretical quantum materials, focused on optics in van der Waals magnets. The prospective postdoc will work on the theoretical fundamentals of controlling magnetic states of two-dimensional magnets using light. The project aims to drive ordered magnets to a quantum spin liquid regime and drive a non-collinear magnet to a multiferroic state, with the ultimate objective of achieving precise optical control over these magnetic states.

The project will be carried out in collaboration between the theory group of “Correlated Quantum Materials” (Prof. Jose Lado) and the experimental group of “Photonics” (Prof. Zhipei Sun) at Aalto University. The position will focus on theoretical and computational modeling of van der Waals heterostructures, aiming at phenomena that can be potentially realized at the group of Prof. Zhipei Sun at Aalto.

Your role and experience

Van der Waals magnets represent a disruptive platform for fundamental quantum phenomena, providing unique opportunities for the electric control of complex magnetic phenomena through optical means. Traditionally, controlling magnetic states has been a challenging task, but the rise of two-dimensional materials offers new possibilities due to their tunable properties. The ability to manipulate the Hamiltonian through twist, stack, and proximity effects in these materials provides a genuine playground for groundbreaking applications in two-dimensional skyrmionics, magneto-optics, quantum magnetism, spinorbitronics, and electrically controllable fractional quantum matter.

The postdoc will work on developing theoretical strategies to control the magnetic states of two-dimensional magnets using light. This includes exploring how to theoretically exploit anisotropic magnetic interactions, charge reconstructions, twist engineering, and proximity effects to achieve unconventional magnetic states. The research will have a strong emphasis on both fundamental theory and applications in experimental devices developed at Aalto. We seek highly motivated individuals with a strong background in theoretical physics and quantum materials, interested in emergent physics in

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artificial van der Waals heterostructures.

Other requirements: \* PhD degree (by the starting date of the postdoctoral position). Candidates that will get their Ph.D. degree prior to the start of the position are eligible to apply. \* Working proficiency in English. Finnish language is not required.

#### What we offer

The fixed term contract is initially for 2 years and the annual workload of research and teaching staff at Aalto University is 1612 hours. Aalto University follows the salary system of Finnish universities. The starting salary for a postdoc ranges from 4020 € to 4420 € per month (gross), depending on previous experience. The contract includes Aalto University occupational healthcare.

Our vast array of professional development opportunities means you will grow and learn, having the chance to participate actively in staff trainings and development projects based on your interests and needs. There is great freedom in your role, and we have a flexible modern working culture. We work in a hybrid way, and the primary workplace is Otaniemi, Espoo. The Otaniemi campus is a thriving and connected community of 100 nationalities, 13,000 students and 4,500 employees. Life at the campus is vibrant and filled with amazing architecture, calming nature, and a variety of cafes, restaurants, services and good connections along the recently opened metro line.

#### Join us!

To apply, please submit your application including the attachments mentioned below as one single PDF document in English through our online recruitment system (“Apply Now!”).

- (1) Letter of motivation
- (2) CV including a list of publications
- (3) Ph.D. degree certificate (if available), or a short statement mentioning the expected date of the Ph.D. defense
- (4) Contact details of two referees

The deadline for applications is 17.8.2024. The position will be filled as soon as a suitable candidate is identified. For additional information, kindly contact Prof. Jose Lado ([jose.lado\(at\)aalto.fi](mailto:jose.lado@aalto.fi)). Aalto University reserves the right for justified reasons to leave the position open, to extend the application period, reopen the application process, and to consider candidates who have not submitted applications during the application period.

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We will go through applications, and we may invite suitable candidates to interview already during the application period. We aim to have a transparent and equal recruitment process, so feel free to ask us for feedback.

Please note: Aalto University's employees should apply for the position via our internal HR system Workday (Internal Jobs) by using their existing Workday user account (not via the external webpage for open positions). Aalto University's students and visitors should apply as external candidates with personal (not aalto) email.

Want to know more about us and your future colleagues? You can watch these videos:

[url=https://www.youtube.com/watch?v=#61;5k\_og\_6zUJQ]Aalto University - Towards a better world, [url=https://www.youtube.com/watch?v=#61;dUfEGVM-ZP8&feature=#61;youtu.be]Aalto People , and [url=https://www.youtube.com/watch?v=#61;ZK6pDWm1\_CE]Shaping a Sustainable Future. Read more about working at Aalto: [url=https://www.aalto.fi/en/careers-at-aalto]https://www.aalto.fi/en/careers-at-aalto

Check out our new virtual campus experience: [url=https://virtualtour.aalto.fi/]https://virtualtour.aalto.fi/

### About Finland

Finland is a great place for living with or without family - it is a safe, politically stable and well-organized Nordic society. Finland is consistently ranked high in quality of life and was just listed again as the happiest country in the world: [url=https://worldhappiness.report/news/its-a-three-peat-finland-keeps-top-spot-as-happiest-country-in-world/]https://worldhappiness.report/news/its-a-three-peat-finland-keeps-top-spot-as-happiest-country-in-world/. For more information about living in Finland: [url=https://www.aalto.fi/en/careers-at-aalto/living-in-finland]https://www.aalto.fi/en/careers-at-aalto/living-in-finland.

### Contact Information

Please reference Academickeys in your cover letter when applying for or inquiring about this job announcement.

### Contact

Finland

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