Postdoc Position for Anyon Particles and Topological Phenomena in Designer Platform
Aalto University

Job Title	Postdoc Position for Anyon Particles and Topological Phenomena in Designer Platform
Department	T304 Dept. Applied Physics
Institution	Aalto University , , Finland
Date Posted	Jan. 12, 2023
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/Otaniemi-Espoo-Finland/Postdoc-Position-for-Anyon-Particles-and-Topological-Phenomena-in-Designer-Platform_R35266
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 12 000 students, 400 professors and close to 4 000 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.

The Quantum Circuits and Noise group at the Department of Applied Physics is now looking for a

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Postdoctoral researcher

We are seeking applications for experimental research on anyon particle and topological phenomena in the NANO group, Department of Applied Physics at Aalto University, Finland. We are leading research in quantum technologies based on hybrid van-der Waals quantum materials. These hybrid-circuits form a promising avenue for emerging topological quantum technologies. Our research focuses on the development of supersensitive quantum sensors for the charge, flux, and phonons based on 2-D materials. We are part of the Center of Excellence in Quantum Technology Finland (CoE QTF), a national flagship program for research on quantum science and technology. Our researcher collaborates with several top-level academic groups and quantum technology companies in Finland and around the world.

The motivation of the research is to develop a technological platform for the emergent quasiparticle in a designer quantum material formed at low temperatures. The van der Waals materials can be easily combined in vertical heterostructures, providing an outstanding platform to engineer elusive quantum states of matter. The material response is not only defined by the properties of the building blocks but also arises from the quantum mechanical interactions between them. Thus, it allows the creative combinations of electronic orders that no naturally occurring material possesses. In this project, we will probe these exotic quasiparticles aka ‘anyons’ formed due to interlayer and intralayer interactions via quantum transport. This project will advance the potential relevance of designer material platforms for quantum information science and technology.

Your role

Being a postdoc researcher, you will design, fabricate, and characterize the van der Waals/ 2-D materials quantum devices using in-house state-of-art micro and nanofabrication facilities. The quantum transport studies will be performed at high magnetic fields and sub-10 mK temperatures. You will develop noise and current-current correlation spectroscopy to probe the charge dynamics in designer topological quantum material. Furthermore, the feasibility of possible technological applications in quantum information will be explored. The project will also involve analysis, scientific interpretation, and dissemination of the data. The publication of research in scientific journals, presentation of data at conferences, and meetings with collaborating groups will be an integral part of the research.

Your network and team

Aalto University is the center of quantum technology research in Finland. Being a postdoc researcher, you will be part of the Center of Excellence QTF’s vibrant community working on emergent quantum

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technologies in Europe. You will be collaborating with top-level theorists and experimentalists working on the Otaniemi campus, the largest quantum technology hub in Northern Europe.

Aalto University is an equal opportunity employer committed to diversity and inclusion of people with disability. The NANO group team constitutes researchers from across the world and supports gender equality.

Your experience and ambitions

We are looking for a highly motivated researcher to join our team. You should have an excellent study record in physics, electrical engineering, or related disciplines. Prior experience in the fields of mesoscopic physics, superconductivity, microwave engineering, cleanroom activities, and instrument programming will be a plus. We encourage researchers who have strong interests in quantum technologies to apply.

We require the candidates to have excellent skills in English. Finnish language is not required. To be eligible, a postdoctoral researcher must hold a PhD degree in a suitable field.

What we offer

The project will be funded by the Academy of Finland and the EU. The research will be performed at the Low-Temperature Laboratory situated on the Otaniemi Campus of Aalto University. The laboratory is known for its world record in achieving the lowest temperature in the universe. It is well-equipped with low-temperature experimental facilities. The local facilities available for the research activities are dilution fridges equipped with a high magnetic field, RAMAN spectrometer, rf sputter, metal evaporator, van der Waals material transfer station, e-beam, scanning electron microscope facility, atomic microscopy, and Reactive Ion etching system. All quantum devices will be fabricated in the OtaNano cleanroom.

The position is filled for two years with possible extension up to 5 years altogether. The annual workload of research and teaching staff at Aalto University is currently 1612 hours. Aalto University follows the salary system of Finnish universities. The salary ranges for a postdoc from 3800€ to 4100€ per month (gross), depending on previous experience. The starting salary is 3800 €/month and increases as you progress in your research. The contract includes Aalto University occupational healthcare.

Ready to apply?

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To apply for the position, please submit your application including the attachments mentioned below as one single PDF document in English through our online recruitment system by using the link on Aalto University’s web page ("Apply Now”).

Letter of motivation/Cover letter CV with description of skills and experience PhD Diploma Contact details of two academic advisors

The deadline for applications is 1st March 2023. We will go through applications, and we may invite suitable candidates to interview already during the application period. The position will be filled as soon as a suitable candidate is identified: therefore, we encourage you to send an application as soon as possible. For further information on this project, contact Dr. Manohar Kumar: manohar.kumar(at)aalto.fi. or Prof. Pertti Hakonen: pertti.hakonen(at)aalto.fi.

Aalto University reserves the right for justified reasons to leave the position open, to extend the application period, and to consider candidates who have not applied during the announced application period.

Please note: Aalto University’s employees and visitors should apply for the position via our internal system Workday à find jobs (not external aalto.fi webpage on open positions) by using their existing Workday user account.

Want to know more about us and your future colleagues? You can watch these videos: [url=https://www.youtube.com/watch?v=5k_og_6zUJQ]Aalto University - Towards a better world, [url=https://www.youtube.com/watch?v=dUfEGVM-ZP8&feature=youtu.be]Aalto People , and [url=https://www.youtube.com/watch?v=ZK6pDWm1_CE]Shaping a Sustainable Future. And this webpage about Aalto and Finland: [url=https://www.aalto.fi/en/services/welcome-to-aalto-university-and-finland-info-package]https://www.aalto.fi/en/services/welcome-to-aalto-university-and-finland-info-package

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:

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[url=https://www.aalto.fi/services/about-finland]https://www.aalto.fi/services/about-finland.

Contract: fixed term initially for 2 years, with a possible extension up to five years altogether | Starting date: Earliest possible | Full-time

Keywords: Quantum technologies, Microwave engineering, Low-Temperature physics, Quantum Hall, Quantum transport, Graphene, and Transition metal dichalcogenides

More about Aalto University:
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Contact Information

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

Contact

Finland