Research fellow in the field of superconductivity in graphite and related materials
Aalto University

Job Title	Research fellow in the field of superconductivity in graphite and related materials
Department	T304 Dept. Applied Physics
Institution	Aalto University , , Finland
Date Posted	Nov. 21, 2025
Application Deadline	Open until filled
Position Start Date	Available immediately
Job Categories	Research Scientist/Associate
Academic Field(s)	Physics - General Physics - Condensed Matter/Low Temperature
Job Website	https://aalto.wd3.myworkdayjobs.com/aalto/job/Otaniemi-Espoo-Finland/Research-fellow-in-the-field-of-superconductivity-in-graphite-and-related-materials_R44831
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

Research fellow in the field of superconductivity in graphite and related materials
Aalto University

industrial applications that hold great technological potential. Our research focuses on Materials physics, Quantum technology, Soft & living matter, and Advanced energy solutions. Topics extend 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.

NANO group at the Department of Applied Physics, is seeking outstanding candidates for the position of

Research Fellow
We are looking for talented condensed matter experimentalists to work on superconductivity in graphite and related materials at Aalto University School of Science. In this position you will have a chance to make fundamental discoveries in superconductivity based on flat band superconductivity, either in stacked two dimensional systems or in graphite with embedded stacking faults. These discoveries may pave the way for superconducting technology at room temperature.

Our goal is to investigate flat band superconductivity using twisted bilayer graphene (TBG) and engineered stacking faults in graphite as platforms. In the beginning, a large effort will be invested in understanding the superfluid weight in TBG systems, and how the superfluid weight is connected to the kinetic inductance of these materials. In addition, Josephson junctions including flat band superconductors will be constructed and studied. The planned measurements will be centered in circuit QED type of measurements at microwave frequencies. The implications of this fundamental flat band work will then be applied to multilayered graphite with stacking faults. Properly engineered graphite may form a system that eventually provides a robust room temperature superconductor for technological applications.

Your role and goals
Your role will be in the design of new circuits, supervision of graduate students, participation to the fabrication of devices, implementing and carrying out measurements over a broad range of temperatures, participation in international collaborative work in flat band superconductivity, as well as interaction with theorists to understand what kind of information can be extracted from the measurements.

The work is done as teamwork in the NANO research group at Aalto University School of Science, in collaboration with the groups in the National Center of Excellence QTF - Quantum Technology Finland, and the theory groups of Prof. Päivi Törmä at Aalto University and Prof. Tero Heikkilä at Jyväskylä University. In parallel, the NANO group is pursuing work on fractional Chern insulator in twisted TMD materials. Since there is clear synergy between twisted graphene and twisted TMD samples, you can

Research fellow in the field of superconductivity in graphite and related materials
Aalto University

also contribute to our TMD work which aims to realize non-Abelian anyons without magnetic field.

Your experience and ambitions
We are looking for highly motivated postdoctoral researchers to work on superconducting materials having flat bands and to characterize such novel superconductivity using ultralow-noise microwave experiments. The work is at the leading edge of quantum science, which calls for talented people with understanding of theoretical issues in topological materials and eagerness to work on tough experimental challenges. We expect the candidates to have:

* Several years of successful postdoctoral research in physics, quantum technology, or materials science
* Experience on 2D materials and quantum devices
* Good understanding of superconductivity and topological materials
* Mastering of micro and nanofabrication techniques
* Automation of experiments with MATLAB, Python, or equivalent
* At least a working knowledge of microwave techniques
* Experience on operating dilution refrigerators is desirable
* Excellent skills in English. Finnish language is not required.

What we offer
A vigorous research environment of quantum technology in one of the largest innovation hubs of Nordic countries. Our research group NANO is a member of the Academy of Finland’s Center of Excellence “QTF- Quantum Technology Finland”, national flagship project “Finnish Quantum Flagship”, and a wider, multidisciplinary collaboration Institute Q. The work takes place using state-of-the-art measurement and nanofabrication facilities at Low Temperature Laboratory and Micronova nanofabrication center, which are part of the national OtaNano research infrastructure ([url=http://www.aalto.fi/en/otanano]www.aalto.fi/en/otanano).

In this position, you have the possibility to follow closely the development of quantum technology and modern superconducting device engineering. You will gain experience on high-frequency operation and measurement of superconducting quantum circuits, which forms the basis of the most promising present paradigm for quantum computation. Furthermore, the collaboration within InstituteQ opens up avenues for applications of your knowhow and newly developed technologies.

The fixed term contract is for five years. 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 research fellow from 4500€ to 5000€ per month, depending on previous experience. The contract includes Aalto University occupational healthcare. The primary workplace will

Research fellow in the field of superconductivity in graphite and related materials
Aalto University

be the Otaniemi Campus at Aalto University.

Ready to apply?
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”).

(1) Letter of motivation
(2) CV including list of publications
(3) Degree certificates and academic transcripts
(4) Contact details of at least two referees (or letters of recommendation, if already available)

The deadline for applications is December 21, 2025, while the screening of candidates will start immediately. The position will be filled as soon as a suitable candidate is identified. For additional information, kindly contact 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, reopen the application process, and to consider candidates who have not submitted applications during the application period.

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).

Want to know more about us and your future colleagues? You can watch these videos: [url=https://www.youtube.com/watch?v=i8zawpNMVG8]This is Aalto University! [url=https://www.youtube.com/watch?v=5k_og_6zUJQ]Aalto University - Towards a better world and [url=https://www.youtube.com/watch?v=ZK6pDWm1_CE]Shaping a Sustainable Future.
Read more about working at Aalto: [url=https://www.aalto.fi/en/careers-at-aalto]Careers at Aalto | Aalto University
Check out our new virtual campus experience: [url=https://virtualtour.aalto.fi/]Aalto University - virtual campus tour

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 listed again as the happiest country in the world: [url=https://worldhappiness.report/news/world-happiness-report-2024-most-comprehensive-picture-yet-of-happiness-across-generations/]World Happiness Report 2024
More about Aalto University:

Research fellow in the field of superconductivity in graphite and related materials
Aalto University

[url=https://www.aalto.fi/en/open-positions]Aalto.fi
[url=https://www.youtube.com/user/aaltouniversity]youtube.com/user/aaltouniversity
[url=https://www.linkedin.com/school/aalto-university/]linkedin.com/school/aalto-university/
[url=https://www.facebook.com/aaltouniversity]www.facebook.com/aaltouniversity
[url=https://instagram.com/aaltouniversity]instagram.com/aaltouniversityTo view information about Workday Accessibility, please click here.Please see more of our Open Positions here.

Contact Information

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

Contact

Finland