# Project Employee / Research Assistant for printable 2D nanomaterial ink formulation and testing
## Aalto University



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| **Job Title** | Project Employee / Research Assistant for printable 2D nanomaterial ink formulation and testing |
| **Department** | T304 Dept. Applied Physics |
| **Institution** | Aalto University<br>, , Finland |
| **Date Posted** | Jan. 15, 2025 |
| **Application Deadline** | Open until filled |
| **Position Start Date** | Available immediately |
| **Job Categories** | Research Scientist/Associate |
| **Academic Field(s)** | Physics - General |
| **Job Website** | https://aalto.wd3.myworkdayjobs.com/aalto/job/Otaniemi-Espoo-Finland/Project-Employee---Research-Assistant-for-printable-2D-nanomaterial-ink-formulation-and-testing_R41976 |
| **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 nearly 4 500 other faculty and staff working on our dynamic campus in Espoo, Greater Helsinki, Finland. 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

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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.

The Department of Applied Physics is looking for either a Project Employee (M.Sc.) or a Research Assistant (Bachelor or Master level student) to work on printable 2D nanomaterial ink formulation.

The work is in the context of Business Finland -supported Research-to-business program and will be performed in close collaboration with industrial partners.

According to the World Health Organization, pollution and toxic gases are relevant to 7 million deaths annually, 12% of global fatality. This causes a 6% loss in the global gross domestic product, as estimated by the World Bank. Thus, knowing the type and level of surrounding gases is increasingly urgent. Further issues come from climate change and the escalated geopolitical tension that can lead to the use of battle gases.

The commercial gas sensors made by conventional electronics have intrinsic drawbacks, e.g., high production and energy costs, low selectivity leading to false alarms, difficulty in calibrations, replacements, and recycling, which make them unable to adapt to the future sustainability. In the sustainable smart gas sensor (SGS) project, we aim to develop a low-cost, low-energy consumption, and biodegradable multi-gas sensor by printing, and further estimating possibilities for scaling up.

The SGS project is in perfect alignment with the strategic goals of Finland, where sustainability, bio-derived materials, high-value applications, and dual-use technologies hold significant importance. This alignment ensures that the SGS will contribute substantially to the Finnish business landscape.

Your role and goals

The final goal of the full Research-to-Business project (R2B) is to demonstrate a bio-degradable smart gas sensor, capable of detecting various analysts at low concentrations. The project consists of three major parts: sensor printing, circuit design and integration and development of an AI algorithm.

In your role you will formulate the printable ink and develop reliable printing protocols with various printing technologies. The role requires close collaboration with electrical engineers for circuit design and materials scientists for sensing measurement and AI training.

You will formulate and optimize the rheology and composition of our nanocomposite inks for various

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printing methods (mainly ink-jet printing, extrusion printing and screen printing will be studied with our partners). You will print gas sensors on various substrates (papers, polymer sheets) using the above-mentioned inks and test their performance with the team members and our partners.

The goal is a proof of concept that our nanocomposites can print gas sensors with distinct performance towards targeting gases. Together with the team, you will identify the feasible technology for large-scale sensor fabrication in the future as well as technical problems that need to be solved for further development.

Your network and team

The position is at the Department of Applied Physics of Aalto University School of Science. The work will be done in collaboration with industrial clients. Dr. Zhongpeng Lyu will act as daily supervisor and Prof. Olli Ikkala as the manager.

Your experience and ambitions

Required and desired qualifications: * Hands-on experience on ink formulation, rheology measurement and various printing technologies * Hands-on experience in wet chemistry synthesis and chemical safety * Knowledge of colloids and nanomaterials * Basic skills in device measurement * Problem solving and analytical skills * Ability in team collaboration and technical presentation * Good written and oral communication skills in English. Finnish language is not required.

What we offer

Your tasks belong to a fixed work package under the Research-to-Business project. The contract is for fixed term, equivalent to 6 months full-time workload. The planned start date is the 1st of March 2025. Depending on your degree qualifications, we offer either a Project Employee contract or a Research Assistant contract. The tasks can be adapted to the employee's background and knowledge. Working alongside studies is also possible, in which case the work is done part-time during the academic term.

The main workplace is at the premises of the Department of Applied Physics in Otaniemi (Nanotalo). In part the work is done at the premises of the Department of Bioproducts and Biosystems in Otaniemi and occasionally visiting Tampere University in Hervanta.

Join us!

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Please share the following application materials in English with us through our recruitment site, by clicking the "Apply now!” -button. * Brief cover letter (max one page) * CV (max two pages) with a list of publications and recommendations, and contact information of the recommenders, if any * Academic transcripts of your B.Sc. and M.Sc. studies

The deadline for applications is February 14th, 2025. We encourage you to apply as soon as possible since we aim to fill this position as soon as a suitable candidate is found. We will go through applications, and we may invite suitable candidates to interview already during the application period. You will hear from us at the latest by the end of February 2025.

Aalto University reserves the right for justified reasons to leave the position open, extend the application period, reopen the application process, and 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). Aalto University’s students and visitors should apply as external candidates with personal (not Aalto) email.

More information

For more information regarding the open position, please contact Dr. Zhongpeng Lyu ([url=mailto:zhongpeng.lyu@aalto.fi]zhongpeng.lyu@aalto.fi). If you have questions regarding the recruitment process, please contact HR Advisor Hanna Multisilta ([url=mailto:hanna.multisilta@aalto.fi]hanna.multisilta@aalto.fi).

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. Read more about working at Aalto: [url=https://www.aalto.fi/en/careers-at-aalto]Careers at Aalto | Aalto University

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About Finland

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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]Living in Finland | Aalto Universityand [url=https://www.aalto.fi/en/careers-at-aalto/for-international-staff]For international staff | 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