

# PhD student in Biomedical devices based on cellulose nanocomposites

Norrköping

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Skilled and committed employees are a crucial factor in the success of Linköping University. And we need more of them. Our core expertise comes from teachers and researchers, but a successful university requires experienced and motivated employees in many fields. Everyone is important. We need to recruit many new employees thanks to, among all, an expansion in our research activity. We need you here. We look forward to receiving your application!

At the Department of Science and Technology, at the university's Norrköping campus, we provide education and conduct research in physics and electronics, communications/logistics and media- and information technology. The department is recognised for its work in fields including logistics, visualisation and organic electronics. We combine academic excellence with fruitful collaboration with the Community.

Read more at <https://liu.se/en/organisation/liu/itn>

Wallenberg Wood Science Center (WWSC) is a research center striving for scientific excellence with a focus on new materials from trees. The center creates knowledge and builds competence for an innovative and sustainable future value creation from forest raw materials. WWSC is a multidisciplinary collaboration between KTH, Chalmers, and Linköping University. The base is a donation from Knut and Alice Wallenberg Foundation, and the forest industry is supporting WWSC via the national platform Treearch.

We are looking for a PhD student in Applied Physics, formally based at the Department of Science and Technology, Campus Norrköping.

## **Your work assignments and workplace**

The integration of electronic devices with sustainable, biodegradable materials is of growing interest in bioelectronics and healthcare. Abundant, renewable materials such as cellulose and lignin with excellent mechanical and electrical properties are promising for applications in these fields. Interesting composite material properties for such biomedical devices include electronic and ionic conductivity, both mixed conduction in the same material and separately, as well as gel, foam, and adhesive properties, where a degree of crosslinking is an important parameter for biodegradable and transient electronics. The PhD student will primarily pursue the development of cellulose composites and biomedical devices including: 1) Ionically

conductive, crosslinkable adhesive hydrogels with micron-scale patterning possibility to enhance the interface between technology and tissue, 2) Bioresorbable substrates to provide mechanical stability for medical implants, while dissolving afterward leaving minimally invasive electronics in place, and 3) Transient medical devices for short to mid-term therapeutic use. Advancement within these areas using naturally sustainable, degradable materials will not only improve bioelectronic devices themselves, but aid in the issues of waste and toxic degradation of traditional electronics. The initially targeted applications will build on existing collaborations and ongoing work related to recording and stimulation technologies for the peripheral and central nervous system.

The PhD student will be part of a graduate school within the Wallenberg Wood Science Center (WWSC).

The PhD student will work in the Laboratory of Organic Electronics (LOE) under the supervision of Dr. Mary Donahue. At the Laboratory of Organic Electronics (LOE) we explore electronic and optical properties of organic semiconductors, biomaterials from the forest, and hybrid organic materials. Our activities span the range from basic research to commercialization, the latter carried out in close collaboration with the institute RISE. LOE currently has ~140 researchers and research students divided into twelve units, each led by a principal investigator. Read more at [www.liu.se/loe](http://www.liu.se/loe)

As a doctoral student, you devote most of your time to doctoral studies and the research projects of which you are part. Your work may also include teaching or other departmental duties, up to a maximum of 20% of full-time.

### **Your qualifications**

You have graduated at Master's level in materials science, material chemistry, engineering biology, applied physics, or a related field or completed courses with a minimum of 240 credits, at least 60 of which must be in advanced courses. Alternatively, you have gained essentially corresponding knowledge in another way.

Desirable personal skills and traits for the position are highly motivated, ambitious, problem solving skills and teamwork ability. Experience with microfabrication and electrical / electrochemical characterization are advantageous. Research at LOE is carried out predominantly in English, so relative fluency is favorable. Great emphasis will be placed on personal qualities and suitability.

### **Terms of employment**

When taking up the post, you will be admitted to the program for doctoral studies. More information about the doctoral studies at each faculty is available at [Doctoral studies at Linköping University](#)

The employment has a duration of four years' full-time equivalent. You will initially be employed for a period of one year. The employment will subsequently be renewed for periods of maximum duration two years, depending on your progress through the study plan. The employment may be extended up to a maximum of five years, based on the amount of teaching and departmental duties you have carried out. Further extensions can be granted in special circumstances.

**Starting date**

Winter 2022/2023 or by agreement.

**Salary and employment benefits**

The salary of doctoral students is determined according to a locally negotiated salary progression.

More information about employment benefits at Linköping University is available [here](#).

**Union representatives**

Information about union representatives, see [Help for applicants](#).

**Application procedure**

Apply for the position by clicking the “Apply” button below. Your application must reach Linköping University no later than **25 November 2022**. Applications and documents received after the date above will not be considered. The application should be written in English and include: cover letter (maximum 2 pages, describe what makes you interested in this particular position and how you could contribute to the research and team), CV (including contact details to three reference persons), undergraduate transcript records with grades.

We welcome applicants with different backgrounds, experiences and perspectives - diversity enriches our work and helps us grow. Preserving everybody's equal value, rights and opportunities is a natural part of who we are. Read more about our work with: [Equal opportunities](#).

We look forward to receiving your application!

Linköping university has framework agreements and wishes to decline direct contacts from staffing- and recruitment companies as well as vendors of job advertisements.

## Contact persons

**Mary Donahue**

Principal Research Engineer

011-363142

[mary.donahue@liu.se](mailto:mary.donahue@liu.se)

**Martina Klefbeck**

HR partner

011-363166

[martina.klefbeck@liu.se](mailto:martina.klefbeck@liu.se)

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