university of groningen / faculty of science and engineering

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Autonomous Soft Materials Research Group
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Ph.D. Position in Synthetic Organic & Polymer Mechanochemistry

TactoChem – Mechano-Chemistry for Robots

QUICK FACTS

4-year fully funded Ph.D. positions (AIO, full time)
Embedded in the Lerch Lab
Stratingh Institute for Chemistry, Faculty of Science and Engineering, University of Groningen
Application deadline: December 15th, 2025
Ideal starting date: March/April 2026
Apply here!

Watch overview video here.

POSITION

A sense of touch allows us to handle objects with fine motor skills and navigate the complexities of everyday life. Robots struggle with even simple tasks, because their sensing capabilities remain limited. It is incredibly hard to achieve the level of sophistication and high-density integration of sensing, signal processing, and movement that comes so naturally to us. This project, funded by an European Starting Grant, aims to develop a new class of chemical touch sensors that can be incorporated into robotic prototypes.

Join a rapidly expanding team of PhD students and Postdocs, shape a rapidly emerging field with your insights, and become a forerunner in chemically-driven robotics. The core objective of this PhD project is to synthesize novel mechanophores – molecules that respond to mechanical force – and incorporate them into soft robotic hands to enable a sense of touch in robots. Leverage your synthetic chemistry background and learn more about polymer chemistry, rapid prototyping, and cutting edge analytical techniques.

Your main tasks will include to:

- synthesize mechano-responsive molecules and incorporate them into polymeric networks
- establish structure-activity relationships, supported by simple quantum chemical calculations
- work with polymeric networks and understand how mechanical signals activate chemical responses
- develop a systems chemistry approach to employ mechanophores for robotics
- excel in a top chemistry group with top-notch infrastructure

CANDIDATE PROFILE

We are looking for a collaborative, creative, and excellent colleague with:

- an M.Sc. degree in chemistry or equivalent.
- demonstrable research experience in organic synthesis, mechanochemistry, and/or polymers.
- motivation to design and synthesize novel mechanophores and incorporate them into soft robots
- excellent command of written and spoken English.
- willingness to acquire a variety of additional skills ranging from basic programming to 3D modelling.
- well-developed communication and collaboration skills and the ability to work independently in a multidisciplinary environment.

Ph.D. students are expected to develop scientific independence and complete research projects. Enthusiastic Ph.D. students stay abreast of developments in the field, proactively communicate research results, supervise B.Sc. and M.Sc. students, and work effectively in a team. We are looking forward for you to joining our team to create new mechanochemistry, materials, and robots.

APPLICATION

For more information, please contact Michael Lerch at *m.m.lerch@rug.nl*. The application should include a **letter of motivation**, your **curriculum vitae**, and **contact details (name, telephone number, e-mail address, and affiliation) of at least two references** for a letter of recommendation. Applications received **before Dec. 15th, 2025**, will be considered for this position. First round (online) interviews will take place on: Dec. 17-19, 2025. Second round interviews mid January 2026. Preferred starting date is negotiable but would ideally be in March/April 2026.

Applications by female scientists and candidates from underrepresented minorities are especially encouraged.

THE TEAM

Our team, led by Dr. Michael M. Lerch, aims to create a chemical operating system for robots, thereby developing novel chemistry and materials with unprecedented functions. We believe that chemistry can close the performance gap between living organisms and current electronic robots. Over the years, we have built a unique pipeline where we take newly synthesized molecules, incorporate them into materials, and shape them into functional devices. As a PhD student, you will work in an international and interdisciplinary team in a fast-paced, creative, and collaborative research environment, based at the renowned Stratingh Institute at the Faculty of Science and Engineering at the University of Groningen. The functional materials we develop are societally relevant; as part of ARC CBBC and HTRIC, we work with industrial partners and clinical experts to develop next generation functional coatings and clinically relevant robots. The University of Groningen and the Lerch Research Group strive to create an equitable, inclusive, and respectful environment, where researchers of different backgrounds and disciplines can work at the forefront of science.