

**PhD: Self-organization as a buffer for evolution, using cell polarity as a model.**

**Engels -- Faculty/department** Applied Sciences

**Level** Master degree

**Maximum employment** 38 hours per week (1 FTE)

**Duration of contract** 4 years

**Salary scale** €2062 to €2638

### Applied Sciences

The Faculty of Applied Sciences is the largest faculty of TU Delft, with around 550 scientists, a support staff of 250 and 1,800 students. The faculty conducts fundamental, application-oriented research and offers scientific education at the bachelor, master and doctoral levels. The faculty is active in the fields of Life and Health Science & Technology, Nanoscience, Chemical Engineering, Radiation Science & Technology, and Applied Physics.

A new Department of Bionanoscience has been established at TU Delft, dedicated to research at the interface between nanoscience, synthetic biology, and cell biology. It studies single cells in all their complexity down to the molecular level, from both fundamental scientific and application points of view. The new department operates as part of the Kavli Institute of Nanoscience at the Faculty of Applied Sciences and aims at a leading international position.

### Job description

Core cellular functions are maintained during the course of evolution, even if essential proteins are lost or diversify, or new proteins are gained. How this is achieved is a completely open question. One possibility is that self-organization buffers cellular functions against evolutionary changes in individual proteins. Self-organization is the dynamic organization that emerges from the collective behavior of components, which individually cannot account for the final dynamic pattern. In this project we use the polarity network in budding yeast as a model to study the role of self-organization on evolution. During polarity establishment, a network of proteins self-organizes into a protein pattern on the cell membrane, which marks the site of daughter cell emergence. This process is vital for proliferation. In this pioneering project you will study how much the spatial-temporal organization of the polarity machinery changes (due to self-organization) during a previously established evolutionary trajectory. To achieve this goal you will establish high throughput life cell microscopy and super resolution microscopy assays, set-up quantitative data analysis methods and collaborate with other group members for yeast genetics.

### Requirements

We are looking for an experimentalist who is eager to combine microscopy and data analysis and has a keen interest in evolutionary biophysics. We are a highly collaborative research

group that likes to work on challenging and ambitious problems, that typically combine experiments with computational work. We expect the candidate to have an independent and well-organized work style, to be communicative, and to contribute to our open, interactive, and social lab culture. Applicants are invited to submit an email including cover letter, CV with publication list, and names/email addresses of 3 or more references, to Liedewij Laan ([l.laan@tudelft.nl](mailto:l.laan@tudelft.nl)).

[www.tudelft.nl/laanlab](http://www.tudelft.nl/laanlab)

### Conditions of employment

TU Delft offers an attractive benefits package, including a flexible work week, free high-speed Internet access from home (with a contract of two years or longer), and the option of assembling a customised compensation and benefits package. Salary and benefits are in accordance with the Collective Labour Agreement for Dutch Universities. Delft University of Technology strives to increase the number of women in higher academic positions; women are therefore especially encouraged to apply.

As a PhD candidate you will be enrolled in the TU Delft Graduate School. TU Delft Graduate School provides an inspiring research environment; an excellent team of supervisors, academic staff and a mentor; and a Doctoral Education Programme aimed at developing your transferable, discipline-related and research skills. Please visit [www.phd.tudelft.nl](http://www.phd.tudelft.nl) for more information.

### Information and application

For more information about this position, please contact Dr. ir. Liedewij Laan, phone: +31 (0)15-2782856, e-mail: [l.laan@tudelft.nl](mailto:l.laan@tudelft.nl). To apply, please e-mail a detailed CV, a letter of application and references by August 12th, please refer to vacancy number ????????