

Postdoc position

Idema lab

Department of Bionanoscience, TU Delft

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We have an opening for a postdoc position in theoretical biophysics, in either of the two main research lines of our group.

Option 1: Membrane-cytoskeleton interactions

Cells and organelles undergo significant reshaping both during division and in essential cell processes like endocytosis and crawling. Shape changes that affect the whole cell involve both the cellular membrane, as the barrier between the inside and the outside of the cell, and the active cytoskeleton, which generates the necessary forces for the deformation. In this project, we'll investigate the interaction between cytoskeleton and membrane, with a special focus on how this interaction can facilitate the cellular processes mentioned above. A potential application is the division of liposomes as part of the ongoing effort of building an artificial cell. Potential experimental collaborators include the groups of Gijsje Koenderink, Marileen Dogterom and Cees Dekker (all in the same department).

Option 2: Collective dynamics of self-propelling active particles

Tissues, colonies and populations consist of large collections of active individual cells, that together form complex structures. As the number of individuals in such a group is typically between 10^2 to 10^9 , neither continuum nor individual particle-based analytical methods can be used to study their behavior in full detail. Moreover, because the particles are active, results from equilibrium statistical physics do not necessarily apply. We therefore study the behavior of such collections using computer simulations. In this project, we'll explicitly include differences between agents, with direct applications to tissue formation and bacterial colony development.

More information about the research projects in our group can be found on our [group website](#) and in our [publications](#).

About our group

We're a fairly small theoretical (bio)physics group embedded in a predominantly experimental department that brings together scientist with backgrounds ranging from mathematics to biology. We collaborate closely with various experimental groups both inside and outside the department, and with theory groups in mathematics, physics and computer science. We frequently host undergraduate (BSc and MSc) students from the physics and nanobiology programs for their final project.

About the position

We're looking for someone with a background in theoretical soft matter or biophysics, who is interested in working on biologically-motivated problems and in collaborating with experimentalist. Experience with simulations is a pro. As part of the position, you'll get to co-supervise undergraduate students for their final project, which can be spin-offs from your own project. If you're interested in developing your teaching skills, you can (but don't have to) participate in the group's teaching activities. You'll also be encouraged and supported in applying for additional funding (e.g. NWO-Veni or Marie-Curie grants) but the position is not dependent on obtaining a grant. We offer a stimulating and collaborative environment with frequent opportunities for interacting with other group members, the other theory group in the department, experimental groups, and related groups in the Netherlands and abroad. Naturally you can contact us if you have any specific questions about the position.

How to apply

Send a motivation letter and a curriculum vitae, including at least two references, to Dr. Timon Idema (t.idema [at] tudelft [dot] nl). Depending on distance, initial interviews may be done over skype, followed by a visit to the department. Application will be open until the position is filled.