

## PhD-student / Postdoc

### *Mesoscopic spatial dynamics in cellular information processing*

<b>Research/ Job description</b>	<p>The aim of this project is to correlate the stochastic spatial dynamics of information-carrying molecules to their function in living cells. Most cellular computations are carried out by proteins, but their abundance is dynamically regulated by gene expression mediated by transcription of DNA into messenger RNA (mRNA), and subsequent translation of mRNA into protein. The movement of these molecules are often governed by anomalous diffusive laws, but whether and how such stochastic spatial dynamics affect the function of these molecules remain largely open questions.</p> <p>Recent advances in light microscopy and molecular labelling techniques have made it possible to observe individual molecules in living cells. We will monitor the movement of both RNA and protein molecules in living bacteria by single-molecule fluorescence microscopy. The stochastic trajectories of mRNA molecules that code for cellular organelles will be correlated with the appearance of the coded protein structures as the mRNA are translated. At the protein level, we will monitor the movement of individual proteins interacting with organellar spatial structures as they participate in signalling reactions. We will derive mobility parameters for these molecules that can be compared between wildtype cells and mutants, and the functional effects of perturbing such spatial dynamics will be tested by <i>in vivo</i> fluorescence resonance energy transfer (FRET) measurements of pathway output.</p>
<b>Location</b>	<p>The FOM Institute for Atomic and Molecular Physics (AMOLF) performs leading fundamental research on physics of Biomolecular Systems and Nano Photonics; two areas with key potential for technical innovations. The Institute contributes to knowledge transfer to industry and society and trains talented young researchers. AMOLF is located at Science Park Amsterdam, The Netherlands, and engages approximately 130 scientists and 50 support staff. See also <a href="http://www.amolf.nl">www.amolf.nl</a></p> <p>The System Biology group at AMOLF is focusing on Physical Systems Biology and will begin operations in February, 2009.</p>
<b>Required qualifications</b>	<p>We seek outstanding candidates with a background in physics, engineering, mathematics or quantitative/systems biology. Experience/knowledge in biophysics, statistical mechanics, control theory and feedback is a plus, but a greater emphasis will be placed on the calibre and drive of the individual. PhD candidates must meet the requirements for an MSc-degree. Postdoc candidates must meet the requirements for a doctors-degree.</p>
<b>Terms of employment</b>	<p>The position is intended as full-time (38 hrs / week, 12 months /</p>

	<p>year) appointment in the service of Foundation for Fundamental Research on Matter (FOM) for the duration of two (postdoc) or four (PhD) years. After successful completion of the PhD research a PhD degree will be granted at a Netherlands university. Several courses are offered, specially developed for PhD-students. AMOLF assists any new foreign employees with housing and visa applications and compensates their transport costs and furnishing expenses.</p>
<p><b>For further information please contact</b></p>	<p>Dr. Tom Shimizu E-mail: t.shimizu@seebelow *</p>
<p><b>Applications can be send to</b></p>	<p>FOM Institute AMOLF Personnel dept. Postbus 41883 1009 DB Amsterdam The Netherlands application@seebelow * Please quote vacancy # 0809.26</p> <p>Please send your:</p> <ul style="list-style-type: none"> <li>- Resume;</li> <li>- Motivation on why you want to join the group (max. 1 page).</li> </ul> <p>Applications without this motivation will not be taken into account. However, with this motivation your application will receive our full attention.</p> <p>* Replace seebelow by amolf.nl</p>