



## PhD Position

A position for research students is offered in the International Research Training Group 1740 at Humboldt-University, Institute of Physics. A doctorate in Physics is to be obtained within three years beginning Sep 1, 2014 or later. We are looking for students with a master's degree in Physics and experiences in at least one of the following fields: theoretical neurophysics, stochastic processes, complex networks (programming skills required). The IRTG offers fellowships, a structured and modern study, training and soft-skills program, including annual summer schools, workshops, dual supervision and a six-month PhD candidate exchange program in Sao Paulo, Brazil.

Networks with non-trivial topology have become a very powerful approach for understanding large complex systems in various fields of applications including Neuroscience, Engineering, Sociology and Economy. In neuronal networks, as well as many other natural systems, one frequently deals with networks of changing topology. We intend to study in this project principles of self-organization in evolving neuronal circuits, particularly the developmental mechanisms that generate criticality in those networks. To bring these principles closer to applications, we will in addition investigate the influence of heterogeneity in the network structure, multiscale connectivity and stochasticity. These theoretical studies will be closely connected with the experimental investigation of networks of retina slices.

In this project we intend to study the behavior of coupled dynamical systems with time-delayed interactions. Such systems appear by the modeling of neuronal networks or interacting lasers. Our goal is to describe and control dynamical patterns appearing in such systems. The project is closely connected to the fields of applied mathematics and theoretical physics.

If interested please contact PD Dr. Sten Rüdiger at [sten.ruediger@physik.hu-berlin.de](mailto:sten.ruediger@physik.hu-berlin.de) (attach CV, thesis, publications).

Your contact person:

PD Dr. Sten Rüdiger  
Humboldt-Universität zu Berlin  
Institut für Physik  
Newtonstr. 15  
12489 Berlin  
Germany

E-Mail: [sten.ruediger@physik.hu-berlin.de](mailto:sten.ruediger@physik.hu-berlin.de)