

# Berlin Center for Studies of Complex Chemical Systems

Fritz-Haber-Institut der Max-Planck-Gesellschaft, Humboldt-Universität, Max-Delbrück-Centrum für Molekulare Medizin, Otto-von-Guericke-Universität Magdeburg, Physikalisch-Technische Bundesanstalt, Technische Universität Berlin, Universität Potsdam.

Seminar

## Complex Nonlinear Processes in Chemistry and Biology

*Honorary Chairman: G. Ertl.*

*Organizers: M. Bär, C. Beta, H. Engel, M. Falcke, M. J. B. Hauser, J. Kurths, A. S. Mikhailov, P. Plath, L. Schimansky-Geier, and H. Stark.*

Friday, 19th April, 2013, 16:00 s.t.

**Address:** Richard-Willstätter-Haus, Faradayweg 10, 14195 Berlin, U-Bahnhof Thielplatz (U3).

Dr. Sergio Alonso

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### Pattern Formation in an active poroelastic model of cell cytoplasm

Many processes in living cells are controlled by biochemical substances regulating active stresses. The cytoplasm is an active material with both viscoelastic and liquid properties. The cytoskeleton is described as a solid matrix that together with the cytosol as an interstitial fluid constitutes a poroelastic material forming the cytoplasm. We incorporate the active stress into a two-phase model of the cytoplasm which accounts for the spatiotemporal dynamics of the cytoskeleton and the cytosol. We find different forms of mechanochemical waves including traveling, standing, and rotating waves by employing linear stability analysis and numerical simulations [1].

[1] M. Radszuweit, S. Alonso, H. Engel and M. Bär, PRL, 138102 (2013)

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