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DLR – DAAD Fellowships
Fellowship No. 391

Research Area : Space

Research Topic: **Assessing the prediction potential of satellite data of global ship movements for economic indices**

DLR Institute: Institute of Materials Physics in Space, Research Group Complex Plasmas, DLR Oberpfaffenhofen

Position: Postdoctoral Fellow

Openings: 1

Job Specification:

The intensive investigations of many particle systems (mainly complex plasmas) to study generic phenomena of emergence and phase transitions in solids and liquids on the microcanonical level has also led to a profound expertise in multivariate nonlinear time series analysis in the research group complex plasmas. The partly newly developed techniques are frequently applied to the analysis of complex systems in general, like atmospheric research, medical or econophysics. Recently, it was e.g. demonstrated that the nonlinear correlation structure among stocks significantly varied in past economic crises and that network-based measures may have the potential to serve as early indicators for drastic changes in the economic environment.

Mandatory AIS (satellite) data of all global ship movements represent a very natural source of information about the global flow of good and may have the potential to predict future developments of economic sectors and their corresponding financial indices. The successful candidate is going to unveal possible correlations and causal relations between real world (here: ship traffic) and the financial data and to develop now- and forcasting methods. The study, which is based on already acquired data of the ship traffic and financial market, will first focus on investigating relations in a well-selected economic sector. It is expected that linear and nonlinear similarity as well as causality measures, complex networks and methods of machine learning will become relevant to decipher the interconnections among and

between the two data set(s). The outcome of the pilot study is then to be generalized to further economic sectors.

Required Qualification: Master degree and PhD in physics, preferable in statistical physics, programming experience

Advantageous Skills: Experience in complex systems, nonlinear data analysis and theory and application of networks

English competence: See requirements on www.daad.de/dlr; good communication skills

Earliest Start Date: As soon as possible

Application Deadline: Until position filled

Further Information: http://www.dlr.de
http://www.daad.de/dlr
http://complex-plasmas.dlr.de