

# PHILOSOPHY MEETS COGNITIVE SCIENCE

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Bochum · Osnabrück  
Situating Cognition RTG

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Website: [www.rub.de/phil-lang](http://www.rub.de/phil-lang).  
Venue: Thursday, November 9, 2017, 16-18, room GA 04/187.  
All interested students and scholars are cordially invited to  
the following talk of the research colloquium:

## Prof. Dr. Holger Lyre

(Magdeburg)

### Structures, dynamics and mechanisms in neuroscience – an integrative account

Proponents of mechanistic explanations have recently proclaimed that all explanations in the neurosciences appeal to mechanisms. The purpose of the paper is to critically assess this statement and to develop an integrative account that connects a large range of both mechanistic and dynamical explanations. I develop and defend four theses about the relationship between dynamical and mechanistic explanations: that dynamical explanations are structurally grounded, that they are multiply realizable, possess realizing mechanisms and provide a powerful top-down heuristic. Four examples shall support my points: the harmonic oscillator, the Haken-Kelso-Bunz model of bimanual coordination, the Watt governor and the Gierer-Meinhardt model of biological pattern formation. I also develop the picture of “horizontal” and “vertical” directions of explanations to illustrate the different perspectives of the dynamical and mechanistic approach as well as their potential integration by means of intersection points.