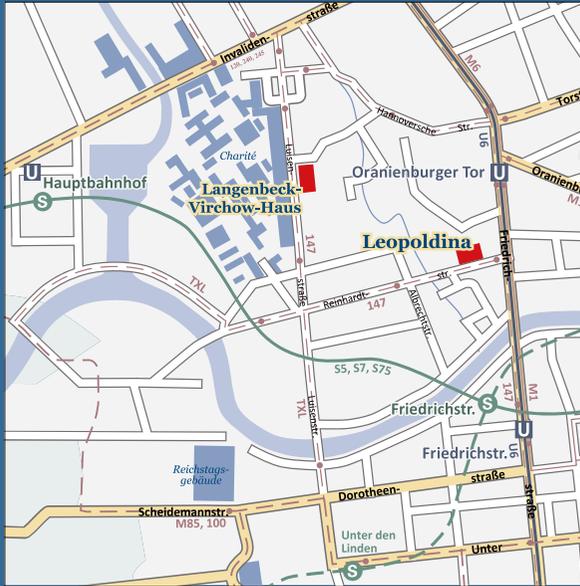


How to get there



Venue

Lecture Hall
Langenbeck-Virchow-Haus
Luisenstr. 58/59
10117 Berlin

The Langenbeck-Virchow-Haus is located next to the Charité in the center of Berlin. It is a ten-minute walk from Berlin central station. Buses 147 and TXL run from central station and Friedrichstraße to Karlplatz. From Karlplatz the TXL connects you to Tegel airport within 30 minutes.

Founded in 1652, the Leopoldina brings together some 1,500 outstanding scientists from about 30 countries. It is dedicated to the advancement of science for the benefit of humankind and to shaping a better future. In its role as the German National Academy of Sciences, the Leopoldina represents the German scientific community in international committees. It offers unbiased scientific opinions on political and societal questions, publishing independent studies of national and international significance. The Leopoldina promotes scientific and public debate, supports young scientists, confers awards for scientific achievements, conducts research projects, and campaigns for the human rights of persecuted scientists.



Leopoldina
Nationale Akademie
der Wissenschaften

Edvard Moser *Nobel Laureate*

Grid Cells and the Brain's Map of Space

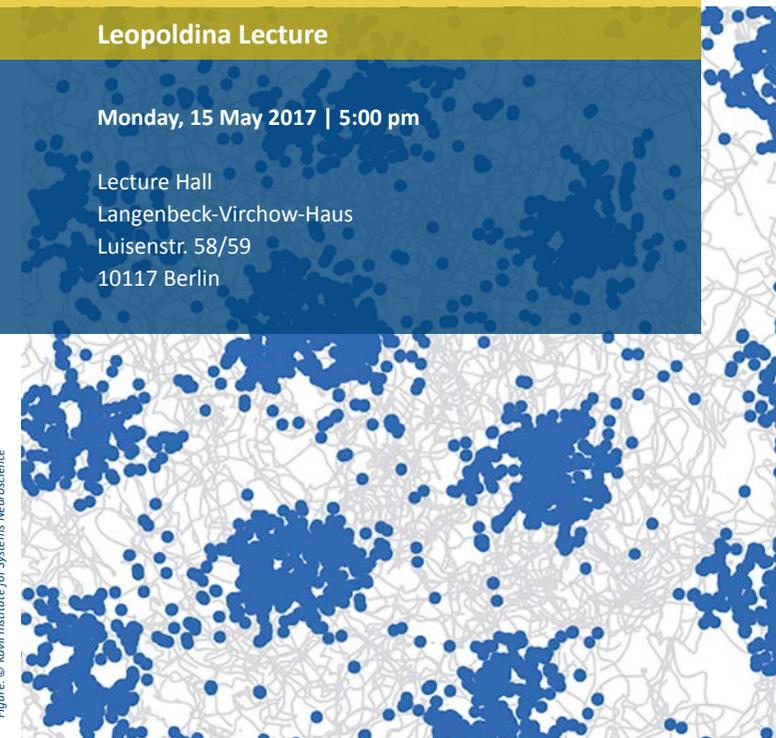
Leopoldina Lecture

Monday, 15 May 2017 | 5:00 pm

Lecture Hall
Langenbeck-Virchow-Haus
Luisenstr. 58/59
10117 Berlin

Contact:

Dr. Katja Patzwaldt
German National Academy of Sciences Leopoldina
Phone: +49 (0)30 203 8997 - 431
E-Mail: katja.patzwaldt@leopoldina.org



Grid Cells and the Brain's Map of Space

The medial entorhinal cortex (MEC) is part of the brain's circuit for dynamic representation of self-location. A key component of this representation is the grid cell, whose spatial firing fields tile environments in a periodic hexagonal pattern, like in a Chinese checkerboard. The MEC circuit contains also other functional cell types, such as head direction cells and border cells, which are intermingled among the grid cells. In this lecture, I will review evidence pointing to MEC network properties as elements of the mechanism for grid formation. I will further demonstrate that running speed is represented in the firing rate of a ubiquitous but functionally dedicated population of MEC neurons, and I will show that speed is represented across a wider brain circuit that includes speed cells in the mesencephalic locomotor region, whose outputs may reach the MEC via speed cells in the diagonal band of Broca. Finally I will present data pointing to some of the mechanisms underlying the early development of the grid-cell system. I will show that maturation of the entorhinal-hippocampal circuit is driven by excitatory activity in the stellate cells of the MEC, with stellate cells instructing progressive maturation through the entorhinal-hippocampal circuit.

With the discovery of place cells and grid cells, as well as other co-localized spatial cell types, it has become possible to study neural computation at the high end of the cortical hierarchy, quite independently of sensory inputs and motor outputs. The presence of an experimentally controllable spatial firing correlate, combined with the access to activity patterns of multiple discrete cell types, provides researchers with a model system to determine not only how specific activity patterns are generated but also how activity gets transformed from one cell type to another.

Programme

Monday, 15 May 2017 | 5:00 pm

Lecture Hall, Langenbeck-Virchow-Haus

Welcoming address

Jörg Hacker ML

President of the German National Academy of Sciences Leopoldina

Lecture

Edvard Moser ML

Founding Director of the Kavli Institute for Systems Neuroscience and Co-Director of the Centre for Neural Computation, Norwegian University of Science and Technology, Trondheim

Reception

Registration

We would kindly like to ask you to register for the lecture via:

www.leopoldina.org/de/grid-cells

ML – Member of the Leopoldina



Edvard Moser

Nobel laureate Edvard Moser is a professor of neuroscience and the Founding Director of the Kavli Institute for Systems Neuroscience, formerly Centre for the Biology of Memory, and Co-Director of Centre for Neural Computation at the Norwegian University of Science and Technology, Trondheim. He has been awarded numerous prizes and is member of many national academies of science, including the German National Academy of Sciences Leopoldina. In the year 2014, Moser won the Nobel Prize for Physiology or Medicine, sharing it with May-Britt Moser and John O'Keefe. The Nobel committee honoured "their discoveries of cells that constitute a positioning system in the brain". Spatial location and spatial memory have been key research interests to Edvard Moser for his entire academic life.

The expertise of the Leopoldina arises from their members – some 1,500 distinguished international scientists of which currently 32 are also Nobel laureates. Recent laureates are Thomas Südhof, Stefan Hell and Satoshi Omura.