Take advantage of

Central Activities

- The Bernstein Conference is the network's central scientific forum. It is the largest annual computational neuroscience conference in Europe, attracting an international audience from across the world.
- Central public relations increase the national and international visibility of the network addressing different scientific and non-scientific audiences.

Further Benefits

- cutting edge neuroscience across disciplines
- unique research infrastructure
- strong national and international links
- stepping stones for your scientific career
- reduced fees to the Bernstein Conference
- special funds for special activities related to the Bernstein Conference

Be part of the Bernstein Network!

www.bernstein-network.de

Bernstein Network Computational Neuroscience

The Bernstein Network is a research network in the field of computational neuroscience. It unites different scientific disciplines, such as physics, biology, mathematics, medical science, psychology, computer science, engineering and philosophy in the endeavor to understand how the brain functions. The close combination of neurobiological experiments with theoretical models and computer simulations allows scientists of the Bernstein Network to pursue innovative approaches with regard to one of the most complex structures nature has created in the course of evolution: the human brain.

The network started in 2004 with a funding initiative of the Federal Ministry of Education and Research (BMBF) to develop and interconnect research structures in computational neuroscience throughout Germany and to promote the transfer of theoretical insight into clinical and technical applications.

It is named after the German physiologist and biophysicist Julius Bernstein (1839-1917) whose „Membrane Theory" provided the first biophysical explanation for how nerve cells encode and transmit information by electrical currents.
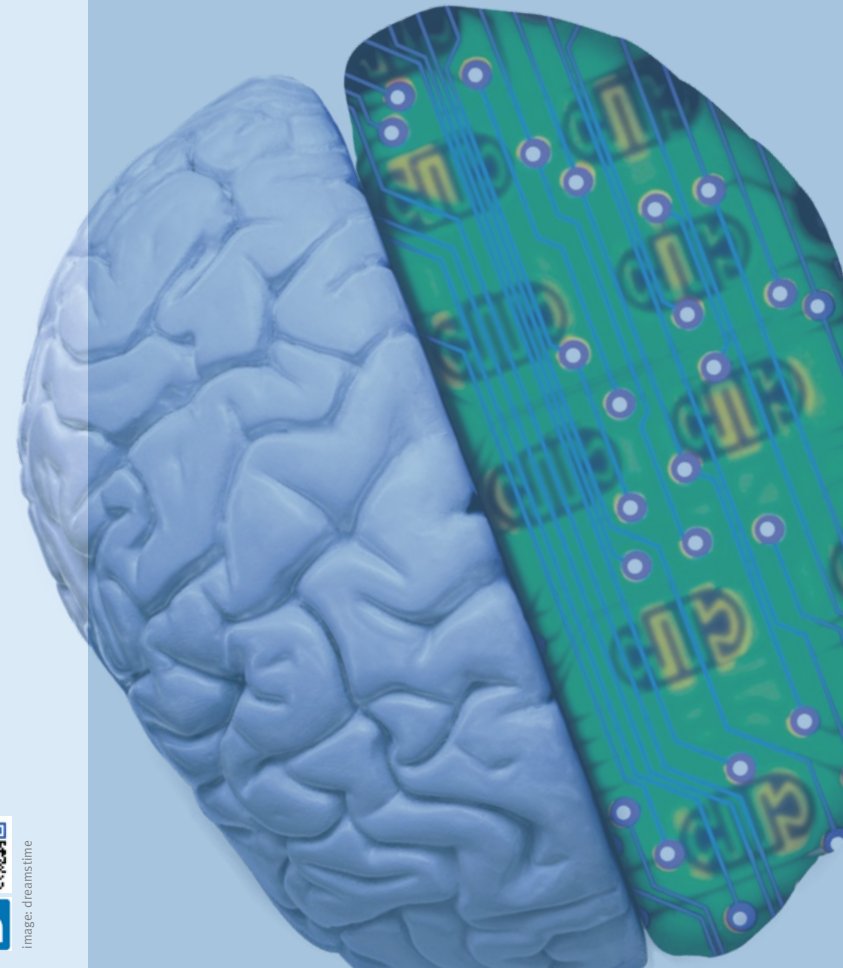
For more information, contact

Bernstein Coordination Site (BCOS)
Branch Office of the Forschungszentrum Jülich
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image: dreamstime

Computational Neuroscience ...

The brain is probably the most complex structure nature has created in the course of evolution. Billions of nerve cells, linked by trillions of connections process enormous amounts of information within fractions of a second.
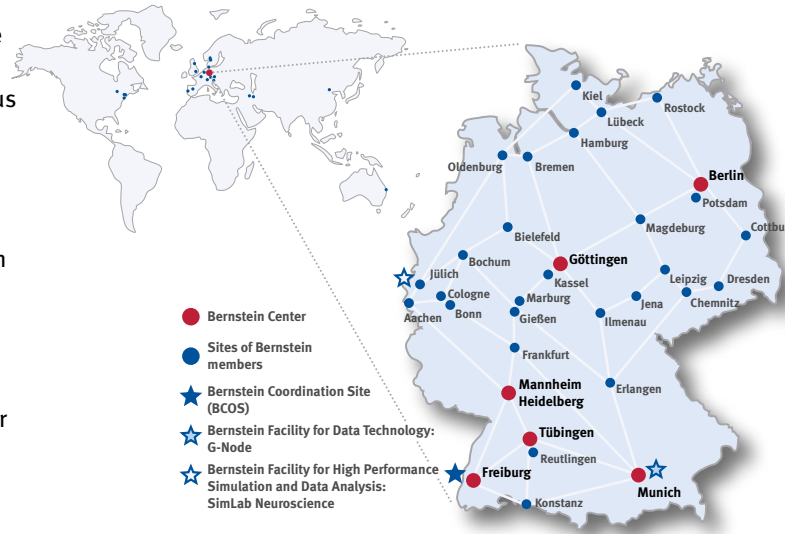
To date, technical systems cannot match the complex, swift and robust performance of the human brain. Computational neuroscience focuses on this information processing capacity from a range of different perspectives. As a field of research, it interacts across disciplines combining neurobiological and biomedical experiments with advanced data analysis, theoretical models and computer simulation to find new avenues for facing key challenges of modern society.

Research in the Bernstein Network unites physics, biology, mathematics, medical science, psychology, computer science, engineering and philosophy in the endeavor to understand how the brain functions. The research topics cover a wide range of brain functions, starting with

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... in the Bernstein Network

- 🔴 Bernstein Center
- 🔵 Sites of Bernstein members
- ⭐ Bernstein Coordination Site (BCOS)
- ⭐ Bernstein Facility for Data Technology: G-Node
- ⭐ Bernstein Facility for High Performance Simulation and Data Analysis: SimLab Neuroscience

Kiel, Lübeck, Rostock, Hamburg, Oldenburg, Bremen, Berlin, Potsdam, Bielefeld, Magdeburg, Cottbus, Bochum, Göttingen, Kassel, Leipzig, Dresden, Jülich, Marburg, Jena, Chemnitz, Cologne, Gießen, Ilmenau, Aachen, Bonn, Frankfurt, Mannheim Heidelberg, Erlangen, Tübingen, Reutlingen, Freiburg, Munich, Konstanz

different steps in processing sensory input and reaching up to cognitive functions and motor control. Cognitive performances like learning and memory or decision making might not be entirely comprehended, yet the progress in the field is significant. Already, certain processes of neurological diseases, such as epilepsy, can be simulated on the computer. This allows conclusions on their origins and, in a second step, on developing diagnostic tools and effective therapies.

Computational neuroscience within the Bernstein Network is working towards understanding the brain and changing the future. The cross-disciplinary approaches and the use of mathematical simulation of parts of the nervous system, such as individual nerve cells, synapses and entire neuronal networks can now do what Julius Bernstein could only dream about at the beginning of the 20th century.

... for young scientists

The promotion of young scientists on all levels of their academic careers is a core task of the Bernstein Network. With special offers at many Bernstein sites, the Bernstein Network paves the way for this innovative way of thinking and researching.

Scientists in the Bernstein Network significantly contribute to neuroscience programs at their local institutions. The offer ranges from Master and PhD programs, advanced courses and seminars to workshops and summer schools.

www.bernstein-network.de/en/study-training-options

SMARTSTART

On a cross-institutional scale, the Bernstein Network offers the **SMART**START Training Program in Computational Neuroscience, which is funded by the Volkswagen Foundation. It is taught in English and open to international applicants. The program provides young researchers with the opportunity to complement their previous studies with concepts, theories and techniques of computational neuroscience.

It aims at preparing them for a career in computational neuroscience; the young scientists can benefit from the Bernstein Network's wide range of topics, expertise and research opportunities all over Germany and dive into the interdisciplinary working routines of computational neuroscience.

VolkswagenStiftung

www.smartstart-compneuro.de