

# Complex world, simple rules:

## The School of Systems Science at Beijing Normal University

Muduo (traditional bell) at BNU

Founded in 1902, Beijing Normal University (BNU) is one of the top 10 universities in China, offering a strong emphasis on the humanities and sciences. The history of systems science studies at BNU began in 1979 with the establishment of the Institute of Nonequilibrium Systems. In 1985, the field of systems theory was founded, sparking a concerted effort by BNU to develop and grow systems science at the university. In the intervening three decades, BNU's systems science program has garnered support from many famous scholars—including world-renowned engineer Hsue-Shen Tsien and Nobel Prize-winning physical chemist Ilya Prigogine—and has grown into an internationally competitive program, providing students with a strong foundation in a broad range of systems-related disciplines.

### The School of Systems Science

The School of Systems Science (SSS) was established in 2013, with the aim of creating a globally recognized institution for scientific research and training. The school strives to be a pioneer in building a solid base for systems science in China, while also offering a platform for interdisciplinary research and scientific innovation at BNU.

SSS is committed to discovering the "simple rules" that guide our exploration of this complex world, to expanding the frontiers of systems science research, to cultivating exceptional students and researchers, and to transforming academic progress in systems science into forces for social and economic change, all with the goal of deepening our understanding of nature and society.

"Systems science focuses on tackling the basic scientific problems underlying the nature and evolution of complex systems."



Clockwise, from left: BNU's Jingshi Academic Hall, gate of the Zhuhai campus, and SSS logo and motto.

### A broad research base

As a discipline, systems science focuses on tackling the basic scientific problems underlying the nature and evolution of complex systems. As the discipline has developed and matured over the past 30 years, researchers at BNU have attempted to reveal the general rules of complex systems through the study of their evolution. Areas of study include the emergent behavior of complex systems and the intelligent control of the nature and function of these systems. The direction and level of scientific research at SSS is on par with international systems science research and follows similar trends.

The work done at SSS spans an impressively broad range of topics, comprising six primary subfields: 1) fundamental theories of complex systems, 2) social and economic systems, 3) biological ecosystems and the self-organizing behavior of the brain and cognition, 4) multiagent systems and evolutionary algorithms, 5) information technology for artificial intelligence systems, and 6) the science of science. Research coming out of SSS has gained worldwide attention. Its groundbreaking work has aroused widespread interest both in the scientific community and in the public sphere in areas such as network reconstruction and control, the network structure of Chinese characters and related learning systems, the spiking neural

network model for understanding working memory, and a parameter-free model for human mobility. It should be noted that SSS is open to the pursuit of other fields of interdisciplinary research in the natural and social sciences beyond the six listed above.

With its drive to enhance our understanding of the richness and complexity of the world around us, SSS aims to train exceptional scientists with a solid academic foundation and strong interdisciplinary skills in systems science. These graduates will become proactive leaders with a strong sense of social responsibility and a comprehensive global vision. The school warmly welcomes applications and cooperation from top researchers from around the world.

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