



# Leibniz Lecture

## **Professor Dr.-Ing. Frank Allgöwer**

Head of the Institute for Systems Theory  
and Automatic Control  
University of Stuttgart, Germany  
Vice President of the DFG since 2012  
Gottfried Wilhelm Leibniz Prize Recipient, 2004

Date & Time: Tuesday, February 27, 2018, 5.00 pm  
Venue: German-Russian Institute of Advanced  
Technologies KNRTU-KAI (GRIAT)  
Chetaev Str. 18a, 420126 Kazan



The lecture will be held in English.

## **Networked Cybernetics: From the Classical Feedback Loop to the New Cybernetics of the 21st Century**

### **About the lecture:**

Feedback based automatic control has been a key enabling technology for many technological advances over the past 80 years. New application domains, like autonomous cars driving on automated highways, energy distribution via smart grids, life in smart cities or the new production paradigm Industry 4.0 do, however, require a new type of cybernetic systems and control theory that goes beyond the classical ideas. Starting from the concepts of feedback and its significance in nature and technology, we will present in this talk the new developments and challenges in connection to the control of interconnected networks of complex systems.

### **About the speaker:**

Frank Allgöwer, Vice President of the Deutsche Forschungsgemeinschaft (DFG), is the Director of the Institute for Systems Theory and Automatic Control and professor in the Mechanical Engineering Department at the University of Stuttgart in Germany. He studied Engineering Cybernetics and Applied Mathematics at the University of Stuttgart and the University of California, Los Angeles respectively. He received his PhD in Chemical Engineering from the University of Stuttgart. Prior to his present appointment, he held a professorship in the Electrical Engineering Department at ETH Zurich. He also held visiting positions at the California Institute of Technology, the NASA Ames Research Center, the DuPont Company and the University of California, Santa Barbara.

His main interests in research and teaching are in the area of systems and control with an emphasis on the development of new methods for the analysis and control of nonlinear systems. Of equal importance to the theoretical developments are practical applications and the experimental evaluation of benefits and limitations of the developed methods. Applications range from control of atomic force microscopes and biomedical applications to the control of roller coasters and systems biology.

He serves among others on the Scientific Council of the German Society for Measurement and Control (GMA) and the Board of Governors of the IEEE Control System Society, and is Chairman of the IFAC Technical Committee on Nonlinear Systems, Member of the IFAC Policy Committee, and Chairman of the International Affairs Committee of IEEE CSS. He has also been a Member of the Council of the European Union Control Association.

Frank Allgöwer has organized several international conferences and has published over 150 scientific articles. He has also received several recognitions for his work including the IEEE distinguished lectureship, appointment as an IFAC Fellow and the DFG Gottfried Wilhelm Leibniz Prize, which is Germany's most prestigious research award.

The **Deutsche Forschungsgemeinschaft (DFG, German Research Foundation)** is the largest independent research funding organisation in Germany. It is an association under German private law. Its member organisations include German universities, non-university research institutions, academies of sciences and humanities, and scientific associations. It serves all branches of science and the humanities by funding research projects and facilitating cooperation among researchers.

The DFG facilitates national and international cooperation among researchers, provides scientific policy advice and fosters relations with the private sector. It also promotes gender equality in the German scientific and academic communities and encourages the advancement and training of early career researchers.

The **Gottfried Wilhelm Leibniz Prize** has been awarded by the DFG every year since 1986 to exceptional scientists and academics for their outstanding achievements in the field of research. This most prestigious research award in Germany aims to improve the working conditions of outstanding scientists and academics, expand their research opportunities, relieve them of administrative tasks, and help them employ particularly qualified early career researchers. A maximum of €2.5 million is provided per award.

The Leibniz Lecture is a format used by the DFG to invite Leibniz Prize laureates for lectures, seminars and visits abroad in order to stimulate dialogue between the laureates and the research community, as well as with the broader public in the host country.

The DFG organises **Leibniz Lectures** in different regions around the world in order to promote German science, especially at locations where it has its own foreign representations, such as in Brazil, Russia, India, China, Japan, and the USA. Germany's scientific relations with Russia are part of a lively, centuries-old tradition. Russia is particularly significant for the German scientific system and is a priority country in the DFG's international activities. The DFG has maintained an intensive scientific dialogue with Russia for decades and, since 2003, has supported the development of bilateral cooperation through its own representative office in Moscow, the **DFG Office Russia/CIS** (<http://www.dfg.de/ru>). As well as being the DFG's liaison office, it functions as a local point of contact for Russian scientists, providing advice and supervising in cooperation programmes.

In 2012, the DFG Office organised the first Leibniz Lecture in Moscow. Since then, the following lectures have been held annually in the Russian Federation:

- 2017: Wolfgang Ertmer (Institute of Quantum Optics, Leibniz Universität Hannover), "Cold Atom Based Quantum Metrology", Faculty of Physics, Lomonosov Moscow State University (MSU), Moscow;
- 2016: Hartmut Leppin (Goethe-Universität Frankfurt/Main), "Antikes Christentum und Religiöse Gewalt" (Античное христианство и религиозное насилие), Scientific Library of Lomonosov Moscow State University (MSU), Moscow;
- 2015: Hartmut Leppin (Goethe-Universität Frankfurt/Main), "Demut und Macht: Die christlichen Kaiser der Spätantike (Смирение и власть: императоры-христиане позднего Рима)", Russian State University for Humanities, Moscow;
- 2014: Günter Ziegler (Freie Universität Berlin), "Sugar Cubes, Soap Bubbles, A Revolution and A Star: Some Stellar Images between Mathematics and Physics", Steklov Institute of Mathematics, Saint Petersburg Branch;
- 2013: Günter Ziegler (Freie Universität Berlin), "Cannons at Sparrows: Cutting Polygons via Configuration Spaces", Library Hall, Hotel Balchug, Moscow;
- 2012: Matthias Kleiner (DFG President), "Strategic Research in Engineering – Advanced Light Metal Extrusion for Low Energy Design", Lomonosov Moscow State University, Moscow.