
**School of Management and Engineering Vaud, Yverdon-les-Bains,
Switzerland**

Lecture Series SIT (Simulation des Systèmes Thermiques): Lecture No. 1, 2016

Friday, 8th of April 2016, 14:55, Cheseaux, Salle C23

**What Can Convection Teach Us about
the Nature of Turbulence?****Prof. Dr. Friedrich Hermann Busse**
University of Bayreuth
Institute of Theoretical Physics**Abstract**

Thermal convection in a fluid layer heated from below provides a most convenient setting for experimental and theoretical studies of turbulence. The Rayleigh number R as a measure of the applied temperature difference is the control parameter. The Prandtl number is the second dimensionless parameter describing the ratio of the two nonlinearities governing the system. The evolution from simple convection rolls to convective turbulence with increasing R can either be simulated numerically or be studied through following sequences of subsequent bifurcations. The regular solutions obtained in the latter case often exhibit the patterns that become visible as coherent structures in the turbulent version of the system. Similarly, in experiments turbulence evolves usually with increasing control parameter through uncontrolled initial or inlet conditions. Alternatively, through controlled initial and boundary conditions sequences of subsequent regular spatially and time-periodic flows may be realized as will be demonstrated by a short movie.

The lecturer

Friedrich Hermann Busse (* 30. September 1936 in Berlin) is a German physicist, who is working in the field of fluid mechanics, geo- and astrophysics. He studied from 1956 at the University of Göttingen and from 1958 at the Ludwig-Maximilians-University in München, where in 1962 he graduated in theoretical physics. After employments at MIT, UCLA and the Max-Planck-Institut of Physics in Munich, in 1970 he became Associate Professor (PA) at UCLA and 1973 Ordinary Professor (PO). From 1984 he was professor at the University of Bayreuth and professor in residence at the Geophysical and Planetary Physics Department of Earth and Space Science of UCLA. He is member of numerous physical societies and won prestigious scientific prizes, see also Wikipedia:

https://de.wikipedia.org/wiki/Friedrich_Hermann_Busse and <http://www.busse.physik.uni-bayreuth.de/de/index.html>