universität wien

Fakultät für Mathematik

EINLADUNG
Mathematisches Kolloquium
und
Junior Kolloquium

Arnold Neumaier *(Universität Wien)*
Mittwoch, 8. März 2017

14:30 Uhr – Junior Kolloquium:
"Reproducing Kernel Hilbert Spaces"

15.45 Uhr – Kaffeepause

16.15 – Vortrag:
**"Coherent Spaces -- a Nonlinear
Generalization of Hilbert Spaces"**

Anschließend vinum cum pane

Ort: Fakultät für Mathematik, Oskar Morgenstern-Platz 1, Sky Lounge

Christian Krattenthaler

Junior Kolloquium:
Abstract:

This lecture gives an introduction to reproducing kernel Hilbert spaces and their basic properties. To demonstrate their power it is shown how to derive simple error estimates for numerical integration. Examples of reproducing kernels were first discussed by Zaremba 1907 in the context of boundary value problems and by Mercer 1909 in the context of integral equations. The theory was systematically developed by Aronszajn 1950, Krein 1963, and others. Of particular importance is the use of reproducing kernels in complex analysis and group theory, where they are the basis of many important theorems. Reproducing kernel Hilbert spaces and the associated coherent states also have applications in many other fields of mathematics, statistics, physics, and engineering. Coherent spaces (the subject of the subsequent Mathematical Kolloquium lecture) abstract the essential geometric properties needed to define a reproducing kernel Hilbert space.

Vortrag:
Abstract:

The notion of a coherent space is a nonlinear version of the notion of a complex Euclidean space: The vector space axioms are dropped while the notion of inner product is kept. Coherent spaces provide a setting for the study of geometry in a different direction than traditional metric, topological, and differential geometry. Just as it pays to study the properties of manifolds independently of their embedding into a Euclidean space, so it appears fruitful to study the properties of coherent spaces independent of their embedding into a Hilbert space. Coherent spaces have close relations to reproducing kernel Hilbert spaces, Fock spaces, and unitary group representations, and many other fields of mathematics, statistics, and physics. The lecture covers basic notions about coherent spaces and their symmetries. Some of the relations to the fields mentioned will be outlined. (For a complete list of application fields see \url{http://www.mat.univie.ac.at/~neum/cohLectures.pdf}. If you contact me sufficiently in advance, you might affect the fields selected.)