



universität
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Fakultät für Mathematik

EINLADUNG

**Mathematisches Kolloquium
und
Junior Kolloquium**

Mittwoch, 6. Juni 2018

Sky Lounge

Michael Schlosser (Universität Wien)

14:45 Uhr – Junior Kolloquium
„**The Rogers-Ramanujan identities**“

15:45 Uhr – Kaffeepause

16:15 Uhr – Vortrag
„**Bilateral identities of the Rogers-Ramanujan type**“

Anschließend vinum cum pane

Christian Krattenthaler

Junior Kolloquium: “The Rogers-Ramanujan identities“

Abstract: The first and second Rogers-Ramanujan (RR) identities have a prominent history. They were originally discovered and proved in 1894 by Leonard J. Rogers, and then independently rediscovered by the legendary self-taught Indian mathematician Srinivasa Ramanujan some time before 1913. They were also independently discovered and proved in 1917 by Issai Schur. About the RR identities Hardy remarked „It would be difficult to find more beautiful formulae than the „Rogers-Ramanujan“ identities, ...“

Apart from their intrinsic beauty, the RR identities have served as a stimulus for tremendous research around the world. The RR and related identities have found interpretations in various areas including combinatorics, number theory, probability theory, statistical mechanics, representations of Lie algebras, vertex algebras, and conformal field theory.

This talk is oriented towards a general mathematical audience and will be accessible for students. The RR identities and related identities will be surveyed, their partition-theoretic interpretations explained. Further, Watson's proof (published in 1929) of the RR identities will be carefully reviewed. This proof, commonly viewed as the most elementary proof of the RR identities, is analytic and employs the machinery of basic hypergeometric series.

Vortrag: “Bilateral identities of the Rogers-Ramanujan type”

Abstract: The Rogers-Ramanujan (RR) identities are deep identities which have found interpretations in various areas including combinatorics, number theory, probability theory, statistical mechanics, representations of Lie algebras, vertex algebras, and conformal field theory.

In this talk, a number of bilateral identities of the RR type will be presented. These identities are derived by analytic means using identities for bilateral basic hypergeometric series. Our results include bilateral extensions of the RR and of the Göllnitz-Gordon identities, and of related identities by Ramanujan, Jackson, and Slater. Corresponding results for multiserries are given as well, including multilateral extensions of the Andrews-Gordon identities, of Bressoud's even modulus identities, and others. The here revealed closed form bilateral and multilateral summations appear to be the very first of their kind. Given that the classical RR identities have well-established connections to various areas in mathematics and in physics, it is natural to expect that the new bilateral and multilateral identities can be similarly connected to those areas. This is supported by concrete combinatorial interpretations for a collection of four bilateral companions to the classical RR identities.