



Einladung zur öffentlichen Defensio von  
**Manjil Pratim SAIKIA, MSc**

Thema der Dissertation:

**Topics on Alternating Sign Matrices and Aztec  
Rectangles**

**Abstract:**

Mathematicians, specially combinatorialists are always on the lookout for beautiful structures and formulas. Two such beautiful formulas are respectively the number of alternating sign matrices (ASMs) of a given order and the number of domino tilings of Aztec diamonds. Each is given by a simple expression. The existence of formulas of such compelling simplicity and beauty have encouraged mathematicians to look for further refinements in these objects and enumerate them. This thesis deals with two such problems which are inspired by the lookout for formulas of some degree of simplicity and beauty.

On one hand we prove refined enumeration formulas for several symmetry classes of ASMs as well as for some closely related classes of matrices with respect to classical boundary statistics. Our results prove conjectures of Robbins, Fischer and Duchon. On the other hand, we look at the more general problem of finding the number of domino tilings of an Aztec rectangle with arbitrary defects on the boundary. The technique that is used for proving this result is called Kuo condensation. We also present a generalization of Kuo's result, which in itself is a generalization of a result of Ciucu.

**Zeit:** Freitag, 20. September 2019, 15:00 Uhr

**Ort:** Fakultät für Mathematik, Hs. 10 (2. Stock), Oskar-Morgenstern-Platz 1

**Prüfungssenat:**

Vorsitz: ao. Univ.-Prof. Dr. Joachim Mahnkopf (Universität Wien)

Univ.-Prof. Mag. Dr. Ilse Fischer (Universität Wien)

Univ.-Prof. Dipl.-Ing. Dr. Michael Drmota (Technische Universität Wien)

Univ.-Prof. Dr. Manuel Kauers (JKU Linz)