KARL-FRANZENS-UNIVERSITÄT GRAZ
UNIVERSITY OF GRAZ
Institute of Mathematics and Scientific Computing

Mathematical Colloquium

Speaker: **Prof. Friedrich Pillichshammer**
(JKU Linz)

Titel: **Quasi-Monte Carlo integration, discrepancy and tractability**

Abstract:
In the first part of the talk we give a brief glimpse of discrepancy theory and quasi-Monte Carlo integration.
The second, main part is devoted to three notions of discrepancies with respect to the Lp norm and a variety of test sets. The Lp star discrepancy uses as test sets the class of axis-parallel boxes anchored in the origin, the Lp extreme discrepancy uses arbitrary axis-parallel boxes and the Lp periodic discrepancy uses so-called periodic intervals which range over the whole torus. All three geometrical notions of discrepancy can be interpreted as worst-case error for quasi-Monte Carlo integration in corresponding function spaces.
We compare these notions of discrepancy, discuss some relationships and present results for typical QMC point sets such as digital nets and lattice point sets. We turn our attention also to the dependence on the dimension d and examine whether these discrepancies satisfy some tractability properties or suffer from the curse of dimensionality.

The talk is based on joint works with Josef Dick (UNSW), Aicke Hinrichs (JKU Linz) and Ralph Kritzinger (JKU Linz).

Time: June 9, 2022; 5pm

Place: HS 11.01 (Heinrichstrasse 36/ground floor)