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**UNIVERSITÄT
BERN**

Philosophisch-
naturwissenschaftliche Fakultät

Departement Mathematik und Statistik

Mathematisches Institut

Mathematical Colloquia

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Monday, 06 March 2023

17:15 h, lecture room B6 (ExWi)

Prof. Dr. Gregor Kemper, Technische Universität München

Distance geometry, algebra and drones

Abstract : Is it always possible to reconstruct a point configuration in the plane from the unlabeled set of mutual distances between the points? This and other questions translate to invariant theory and ultimately to problems in computational commutative algebra. As it turns out, the following question is related: Can a drone, or a ground-based vehicle, reconstruct the shape of a room from hearing echoes of a sound bouncing off the walls? What if it is unknown at what time the sound was emitted? Attacking these questions again leads to commutative algebra and requires massive computer algebra computations. The talk presents results by Mireille Boutin and the speaker, some of them old and some recent.