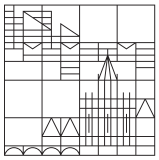
Master Fachseminar on Real Algebraic Geometry

Universität Konstanz



organized by Dr. Maria Infusino and Prof. Salma Kuhlmann

The Core Variety - a new approach to the Truncated Moment Problem

Sarah-Tanja Hess

June 24th, 11.45 – 13.15, Room D404

Abstract. The classical Truncated Moment Problem asks whether a real-valued linear functional defined on the space $\mathbb{R}[X_1, \ldots, X_n]_d$ can be represented as integration with respect to a non-negative Radon measure on $\mathbb{R}^n$. While huge progress has been made in finding solvability criteria for the full case, i.e. when the starting functional is defined on the whole polynomial algebra $\mathbb{R}[X_1, \ldots, X_n]$, new approaches are needed for getting solutions to the truncated case. In 2017 L. A. Fialkow introduced a new approach to the Truncated Moment Problem using the core variety, which we are going to investigate in this talk. We will derive the most important properties of the core variety along with an illustrative example, and see how the core variety can be used to establish necessary and sufficient conditions for solving the classical Truncated Moment Problem. Furthermore, we will pose some open questions and emphasize the great potential of this approach.