



**Universität Konstanz**

**Fachbereich  
Mathematik und Statistik**  
Schwerpunkt  
Reelle Geometrie und Algebra

## **Einladung**

Im Oberseminar *Reelle Geometrie und Algebra* hält

**Sebastian Gruler**

(Universität Konstanz)

am **Freitag, 26.06.2015**, einen Vortrag zum Thema:

*Lower bounds on the size of positive-semidefinite  
lifts for some families of polytopes*

Der Vortrag findet um **13:30 Uhr** in **F426** statt.

Alle Interessenten sind herzlich eingeladen.

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**Abstract:** One says a polytope  $P$  admits a positive-semidefinite (psd) lift of size  $k$ , if  $P$  is the image of the intersection of the psd-cone  $S_+^k$  with an affine subspace under a linear map. The question of whether low-dimensional lifts exists is very interesting in optimization. Lee, Raghavendra and Steurer proved in a recent and celebrated work the first super-polynomial lower bounds on the size of psd-lifts for explicit families of polytopes.

This work is the main topic in my talk. I will give an idea of the proof and present some used tools and a small improvement of the bounds. But first, I present a theorem of Grigoriev (2001), that is very useful for the proof. I also give a new easy proof of it with the help of a recent result of Blekherman and Sinn.

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