

# Berkeley-Stanford Joint Algebraic Geometry Colloquium

Tuesday, October 2, at Berkeley

Frank-Olaf Schreyer (Saarbruecken)

3:45-4:45, Evans 939

## Over-constrained mechanisms and curves of genus 7

**Abstract:** I will describe the algebraic geometry behind certain kinds of “mechanisms” – those made from rigid rods, hinged together and attached to the “ground” at some points. A mechanism is called over-constrained if the dimension of the variety of movements it can make exceeds the “expected dimension”, computed from the number of objects that can move, and the number of constraints satisfied, much as one would compute the “expected dimension” of a variety as the dimension of the ambient space minus the number of equations. I will present a general approach to the discovery of over-determined mechanisms, and study a specific kind of “platform robot” – basically a table that sits on top of rods of various lengths attached to the floor and hinged so that they can meet floor and table at any angle – that is connected to algebraic curves of genus 7.

Andrew Sommese (Notre Dame)

5:00–6:00, Evans 939

## Recent results in numerical algebraic geometry

**Abstract:** Following an overview of Numerical Algebraic Geometry, some recent work will be presented:

- a) work with J. Hauenstein and C. Wampler on regeneration, a new equation-by-equation approach to solving large polynomial systems.
- b) work with D. Bates, J. Hauenstein, and C. Wampler on adaptive multiprecision and Bertini, our new software for doing numerical algebraic geometry computations.
- c) work with D. Bates, C. Peterson, and C. Wampler on numerical computation of the geometric genus of curve components of algebraic sets.

**There will be a dinner afterward. Because reservations must be made in advance, Stanford people should inform Ravi Vakil by *Saturday, September 29*.**

The Berkeley-Stanford Algebraic Geometry Colloquium covers the full range of topics in algebraic geometry, and is intended for a broader audience than a typical research seminar. Graduate students and researchers in nearby fields are particularly welcome. Each meeting features two speakers chosen for their contributions to the field and their expository ability. There will be a dinner afterwards.

To organize transportation from Stanford to Berkeley, please contact Jun Li, Dragos Oprea, Sam Payne, and Ravi Vakil.