

DEPARTMENT OF MATHEMATICAL SCIENCES

Colloquium

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WPI**

Title: Real solutions to polynomial systems and Newton Homotopies.

Abstract: Given a system of n polynomials in n variables, a common problem in numerical algebraic geometry is to find all its real solutions without having to compute all its complex solutions. A first approach to this issue could be to use Newton's method. However, the fractal nature of the boundaries of the basins of attraction for Newton's method can cause numerical instability when using a random initial guess. In this talk, we will give an overview of Newton Homotopy: a generalization of Newton's method that fits within the framework of homotopy continuation methods. We will then discuss new geometric results describing the boundaries of the basins of attraction in Newton Homotopies for small generic systems. This is based on joint work with Jennifer Buettner, Jonathan Hauenstein, Caroline Hills, Hoon Hong, and Emma Schmidt.

Friday, October 2

11:00 am – 12:00 pm

Stratton 202



WPI