11th Annual

Pi Mu Epsilon

Lecture

Maxwell's Problem, 150 years later: from bridges to nano-mechanics

Presented by

Ileana Streinu

Professor of Computer Science and Mathematics
Smith College

Finding a combinatorial characterization for rigid bar-and-joint frameworks in dimensions higher than 3 is an easy-to-state yet elusive, long standing open problem in rigidity theory, originating in two geometry papers from the 19th century of the renowned physicist James Clerk Maxwell. I will summarize our current state of knowledge on Maxwell's problem, and present recent developments leading to a surprising range of applications, from folding robot arms and origami to analyzing the flexibility of molecules and designing materials with unusual mechanical properties.

No advanced prerequisites are necessary. To help build the geometric and kinematic intuitions, the relevant mathematical concepts and techniques will be introduced primarily through physical models and animated graphics.

Wednesday

November 1st, 2017

4:00-5:00 p.m.

115 Avery Hall

University of Nebraska-Lincoln

Reception: 348 Avery Hall
3:30-4:00 p.m.

Sponsored by the Department of Mathematics, the Nebraska Alpha Chapter of Pi Mu Epsilon and the Nebraska Math Scholars Program

Ileana Streinu

Ileana Streinu is the Charles N. Clark Professor of Computer Science and Mathematics at Smith College. She is a 2012 Fellow of the American Mathematical Society and has been awarded the 2010 Robbins Prize of the American Mathematical Society for her algorithmic solution of the carpenter's rule problemy and the 2004 Moisil Prize of the Romanian Academy.

Professor Streinu's area of research is combinatorial and computational geometry. She enjoys working on both theoretical and applied problems. She employs tools from combinatorics, graph theory, rigidity theory, oriented matroids, linear programming and computational algebraic geometry, to work on problems with applications in computer graphics, graph drawing, robotics, statistics, data visualization and, more recently, computational structural biology.