

TEMPLE UNIVERSITY MATHEMATICS COLLOQUIUM

Ileana Streinu

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will speak on

Folding Carpenter's Rules, Robot Arms, Proteins: from geometry to combinatorics

ABSTRACT: The Carpenter's Rule problem, first appearing in the topology community in the mid 70's and then in Computer Science in the 90's as a robot arm motion planning problem, asks whether every simple planar polygon with fixed edge lengths can be reconfigured continuously between two positions, without producing any self-intersections along the way. The solution is a mixture of ideas from geometry, rigidity theory and polyhedral combinatorics, all leading to a curious (but nice and friendly) object, called a pseudo-triangulation.

A main attraction of this talk is its graphical appeal: every concept I define is elementary, depicted graphically (with lots of two- and three-dimensional props) and easy to understand. The "protein" part of the title leads to the future, to one of the major problems in science today (protein folding): I will conclude by telling you what is the connection between folding a robot arm and a protein, and where this research is leading.

MONDAY, 13 APRIL 2009

LECTURE AT 4:00 PM

COFFEE, TEA, AND REFRESHMENTS FROM 3-5 PM

ROOM 617, WACHMAN BUILDING

DEPARTMENT OF MATHEMATICS