**PURDUE UNIVERSITY**

**Department of Mathematics Colloquium**

Speaker: Professor Giulio Peruginelli, University of Pisa
Title: "Atomistic and continuum modeling and simulation of crystalline solids"
Date: Tuesday, February 24, 2009
Time: 4:30 P.M.
Place: MATH 175


**Abstract**

Given a polynomial $f \in \mathbb{Q}[X]$ such that $f(\mathbb{Z}) \subset \mathbb{Z}$ (also called integer-valued polynomial), we investigate whether the set $f(\mathbb{Z})$ can be parametrized by a multivariate polynomial with integer coefficients, that is, the existence of $g \in \mathbb{Z}[X_1, \dots, X_m]$ such that $f(\mathbb{Z}) = g(\mathbb{Z}^m)$. If this happens we say that $f(\mathbb{Z})$ is $\mathbb{Z}$-parametrizable. We give a complete classification of integer valued polynomials $f(X)$ such that $f(\mathbb{Z})$ is $\mathbb{Z}$-parametrizable. In particular it turns out that some power of 2 is a common denominator of the coefficients of $f$ and there exists a rational $\beta$ with odd numerator and odd prime-power denominator such that $f(X) = f(\beta - X)$. Moreover if $f(\mathbb{Z})$ is likewise parametrizable, then this can be done by a polynomial in one or two variables.

This is a joint work with Umberto Zannier.


Refreshments will be served in the Math Library Lounge at 4:00 p.m.