TEMPLE UNIVERSITY MATHEMATICS COLLOQUIUM

Sergei Tabachnikov

Penn State

will speak on

The mysterious Pentagram Map

ABSTRACT: The pentagram map acts on plane n-gons, considered up to projective equivalence, by drawing the diagonals that connect second-nearest vertices and taking the new n-gon formed by their intersections; it also acts on more general objects called twisted polygons. Introduced by R. Schwartz about 18 years ago, the pentagram map has quasi-periodic behavior usually encountered in integrable systems. I shall demonstrate that the pentagram map has an invariant Poisson structure, sufficiently many integrals, and is completely integrable in the Arnold-Liouville sense. I shall also explain that the pentagram map is a discretization of the Boussinesq equation, a well known completely integrable PDE. As a byproduct, new configuration theorems of classical projective geometry will be exhibited.

MONDAY, 12 OCTOBER 2009
LECTURE AT 4:00 PM
COFFEE, TEA, AND REFRESHMENTS FROM 3-5 PM
ROOM 617, WACHMAN BUILDING
DEPARTMENT OF MATHEMATICS