

The Oliver Club

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The Geometry of Polygons

Polygons have been studied for thousands of years, but only recently have mathematicians started to understand the space of all polygons (with a given number of sides of given lengths). In this talk, we will illustrate the space of all polygons through simple examples. We will show how naive ideas to categorize these spaces fail for simple reasons, but nonetheless give us some insight into basic mathematical properties.

Polygon spaces turn out to be symplectic manifolds and form an important set of examples of symplectic reductions. They are obtained via an appropriate quotient of a (larger) space with a Hamiltonian group action. We will use methods of equivariant cohomology and Hamiltonian group actions to calculate the cohomology rings of these quotients, providing a starting point to classify all manifolds and orbifolds obtained by symplectic reduction. We finish with some open questions in Hamiltonian geometry and, more specifically, about polygon space.



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Refreshments will be served at 3:30 PM in the Mathematics Department lounge (532 Malott Hall).

**Thursday, September 20, 2007
at 4:40 PM in 228 Malott Hall**