



Berlin
Mathematical
School

BMS Friday Colloquium

Friday 22 June 2012 at 14:15

Tea before the lecture begins at 13:00

BMS Loft, Urania, An der Urania 17, 10787 Berlin

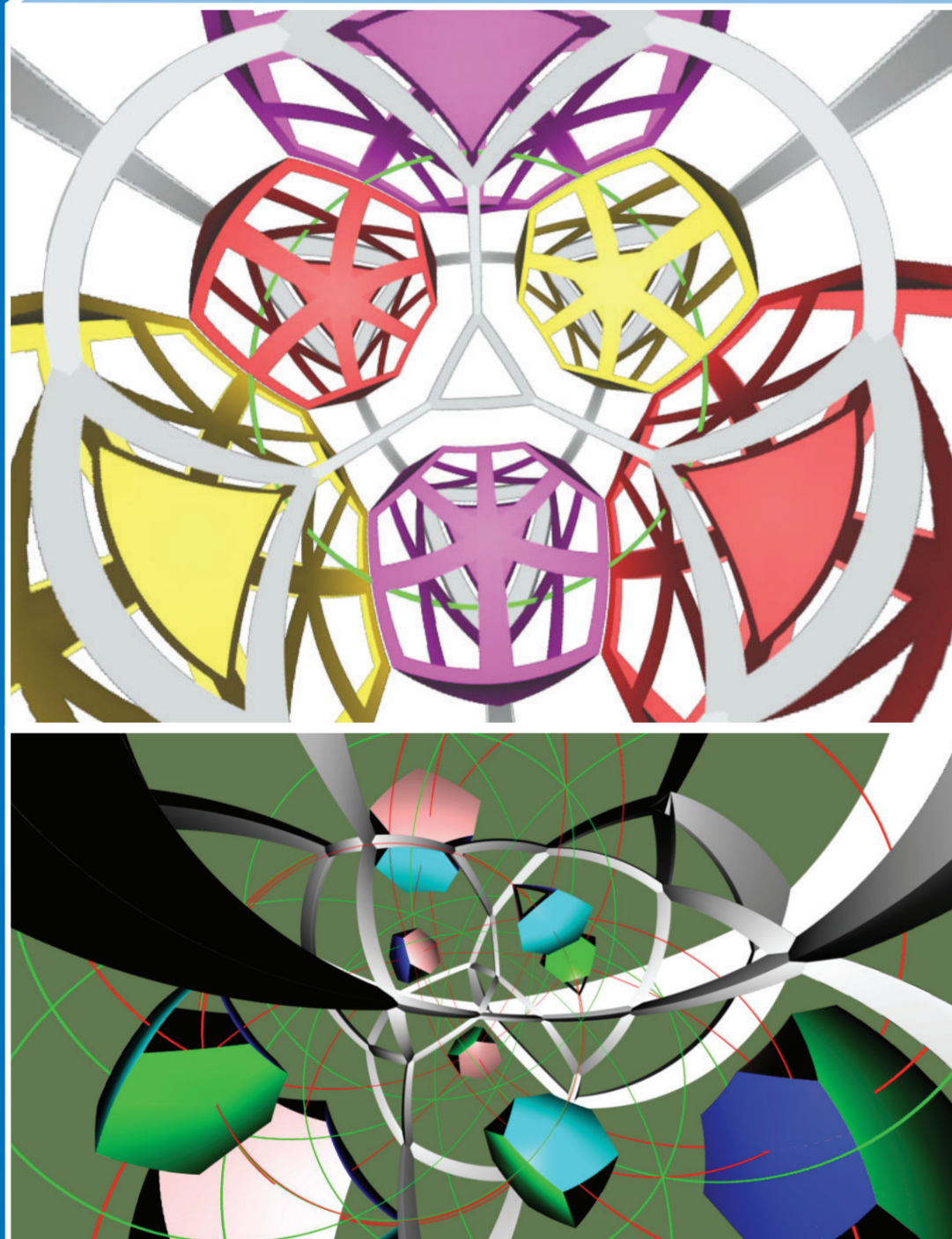
Tom Banchoff

(Brown U)

Folds, Intersections and Inflections for Smooth and Polyhedral Surfaces: Distinguishing Cylinders from Möbius Bands

Any simple closed curve C on a surface in three-space has a strip neighborhood that will be either a cylinder or a Möbius band and there are a number of ways of seeing which kind of strip it is. When the surface sits in Euclidean 3-space, we can determine *gateway curves* W on the surface so that C intersects W an even number of times if the strip is a cylinder and an odd number of times if the strip is a Möbius band. We provide three different gateway curves that serve this purpose: the *fold chain* of a projection to a plane, the *intersection curve* where the surface passes through itself, and the newest example, the *inflection chain*, given in the smooth case by the points of the surface where the mean curvature equals zero. These examples give an introduction to the extrinsic geometry of characteristic classes. The presentation will feature interactive computer graphics illustrations and animations of surfaces in three- and four-space.

Tom Banchoff is a professor of mathematics at Brown University. He specializes in geometry and the use of computer graphics in teaching and research. During the Summer semester April-July 2012, he is the BMS Professor teaching a graduate topics course in Extrinsic Geometry of Smooth Surfaces and Polyhedra.



Pictures by Tom Banchoff and Charles Gunn