

BI-CO MATHEMATICS COLLOQUIUM

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“Cars, Cartoons, and Cohomology”

Monday, September 16, 2019

Talk at 4:00 – Park 338

Tea at 3:30 – Park 361, Math Lounge

Abstract:

How do you program a 3D printer to get the sleek curves on your model of your favorite car? How do animators make sure that complicated surfaces appear smooth on screen? And what do these questions have to do with algebra?

The surface of your model car or your favorite Pixar character's face is made up of a collection of polynomials that fit together smoothly called a spline. These splines are models, but they are also algebraic objects that can be added and multiplied. Some splines contain deep information about the structure of groups and algebraic varieties, encoding their *torus-equivariant-cohomology*.

This talk will introduce you to splines and their traditional uses, show you how a concept that started centuries ago with shipbuilders has become a powerful tool of algebraic combinatorics. We will make connections with algebraic geometry and present some recent results with undergraduates about algebraic splines.

BRYN MAWR COLLEGE