

BI-CO MATHEMATICS COLLOQUIUM

R. Andrew Hicks

"Controlling Ray Bundles with Reflectors"

Monday, September 8, 2014

Talk at 4:00 – H109

Tea at 3:30 – KINSC Math Lounge, H208

Abstract:

How does one design a driver side mirror without a blind spot that does not distort the image? This is essentially the fundamental problem of optical design, which is to guide a given collection of light rays to some prescribed target points on a surface via a family of optical components, such as mirrors and lenses. We consider the problem of performing this task for a single 2-parameter ray bundle as typically is generated by a single source, show that a single reflector is not adequate to solve the problem, and give estimates on how bad the situation can. We will describe applications, including a driver-side mirror without the blind spot problem and mirrors designed for panoramic imaging. Prototypes will be available for inspection.

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