BI-CO MATHEMATICS COLLOQUIUM

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"Metamaterial Lens Design"

Monday, October 3, 2016

Talk at 4:00 – Park 338
Tea at 3:30 – Park 355, Math Lounge

Abstract:

We prove how to design a lens that focuses monochromatic radiation from a light source into a given point when the lens is constructed out of an exotic material known as a Metamaterial (meta = μετα = "beyond" in Greek). Such materials do not exist naturally, but have been constructed in the laboratory in the early 2000's. The research on the behavior of these materials has been extremely active in recent years, especially for applications to invisibility cloaking and development of a "superlens", which can in principle image objects at the smallest scales. In this talk we will discuss the precise construction of the lens; i.e., given one surface of the lens, we construct the second surface explicitly, and show that most of the time the slab has a non-rectangular geometry, even if the given surface is planar. Most of the mathematics involved should be understandable to calculus students. This is joint work with Cristian Gutiérrez.

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