

B I - C O M A T H E M A T I C S C O L L O Q U I U M

Professor Ty Cunningham
Bryn Mawr College

“Moving Cycloids”

Monday, October 23, 2006

Talk at 4:15 – Park 328
Tea at 3:45 – Park 355, Math Lounge

Abstract:

When a circle rolls without slipping on a line, a point on the circle traces a cycloid. If a circle rolls inside a larger circle, you get a hypocycloid. The talk will take off from what I call the *Takeya phenomenon*, a misnomer, based on a false conjecture. It is that a line segment of fixed length can just turn inside a three-cusped hypocycloid, by being tangent to it, while its endpoints move on it. The object of my talk is to understand this phenomenon by generalizing it.

This can be called “kinetic geometry”, the geometry of moving figures. Like all geometry it wants to be understood by pictures, as well as by proofs. This calls for animated pictures, which are made possible by computer graphics. So the talk will be largely an exhibition of moving pictures.

The only background needed is calculus in two dimensions.

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