

R H I T

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

Wednesday, March 29, 2006

Room G219 Crapo Hall

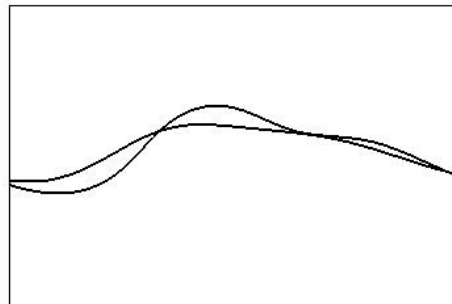
**7th period
(1:35 – 2:25 p.m.)**

**David Finn
Rose-Hulman Math Professor**

Will present

Bicycle Tracks on the Plane and the Sphere

ABSTRACT: The title problem of the MAA book “**Which way did the bicycle go? ... and other intriguing mathematical mysteries**” by Konhauser, Velleman and Wagon considers the following situation: *Imagine a 20-foot wide mud patch through which a bicycle has just passed, with its front and rear tires leaving tracks as illustrated below. In which direction was the bicyclist traveling?* This problem is motivated by the Sherlock Holmes mystery, The Priory School, in which the great detective encounters a pair of tire tracks in the mud and immediately deduces the direction the bicycle was going. This evidence then leads to the finding of a duke’s son and the arrest of a murderer.



In this talk, we will describe solutions to two variations of this problem on both the plane and the sphere in which a criminal could potentially fool the great detective as it is possible for an incredible bicyclist to create tracks for which it is impossible to determine which direction the bicycle went by only the geometry of the tracks. Moreover, an incredible bicyclist can also defeat the great detective by riding in such a way to leave only one track, possibly causing the detective into believing he is pursuing a unicyclist instead.