

CALIFORNIA STATE UNIVERSITY, LONG BEACH

# THE MATHEMATICS COLLOQUIUM

Presents

**Dr. William Ziemer**

Department of Mathematics & Statistics  
California State University, Long Beach

Speaking on

*Understanding Special Relativity by the Geometry of Spacetime*

**Friday, April 17, 2009**

**12:00noon – 1:00PM**

**FO3-200A**

**Abstract:**

After Einstein's 1905 paper on relativity, Minkowski recognized that the structure of spacetime that Einstein described was already known in mathematical community as a semi-Riemannian manifold. This talk will use only the most basic geometry: a (hyperbolic) dot product, and the (hyperbolic) Pythagorean Theorem. The talk will establish Time Dilation, Space Contraction, Simultaneity Paradox, and the Twin Paradox. This will be accessible to graduate students and advanced undergraduates.