

## ***FELIX KLEIN SEMINAR***

**Speaker: Marco Mazzucchelli**  
**École normale supérieure de Lyon**



**Date:** Thursday, December 6, 2018

**Time:** 2:00 PM

**Location:** 258 Hurley Hall

**Lecture Title:**

### **MIN-MAX CHARACTERIZATIONS OF ZOLL RIEMANNIAN MANIFOLDS**

**Abstract**

A closed Riemannian manifold is called Zoll when its unit-speed geodesics are all periodic with the same minimal period. This class of manifolds has been thoroughly studied since the seminal work of Zoll, Bott, Samelson, Berger, and many other authors. It is conjectured that, on certain closed manifolds, a Riemannian metric is Zoll if and only if its unit-speed periodic geodesics all have the same minimal period. In this talk, I will first discuss the proof of this conjecture for the 2-sphere, which builds on the work of Lusternik and Schnirelmann. I will then show an analogous result for certain higher dimensional closed manifolds, including spheres, complex and quaternionic projective spaces: a Riemannian manifold is Zoll if and only if two suitable min-max values in a free loop space coincide. This is based on joint work with Stefan Suhr.