

Math 834a  
Instructor: Yair Minsky  
TTH 11:35-12:50  
Rm. 431 DL

### **Introduction to Representation Theory**

Riemannian geometry is a vast field. This course will be an introduction to the basic machinery, a tour through examples, and a taste of some of the theorems. An incomplete list of topics:

Review of differentiable manifolds; tensor fields; exterior derivatives; Lie derivatives; Frobenius theorem.

Riemannian metrics, connections, geodesic, exponential map, curvature tensor, Jacobi fields. Completeness and Hopf-Rinow theorem. Homogeneous spaces. Riemannian embeddings and submersions.

Myers and Synge theorems on positive curvature, Cartan-Hadamard theorem on negative curvature. Energy, harmonic maps and minimal surfaces. Rauch comparison theorem; Toponogov comparison theorem.

Other topics as time permits; e.g., the Sphere Theorem or Cheeger-Gromov compactness.

Fall Term 2014