

TEMPLE UNIVERSITY

Department of Mathematics

Analysis Seminar

Room 617 Wachman Hall

Monday, November 4, 2019, 2:40 p.m.

Comparison Theorems on H-type Foliations, an Invitation to sub-Riemannian Geometry

by Gianmarco Molino

University of Connecticut

Abstract:

Sub-Riemannian geometry is a generalization of Riemannian geometry to spaces that have a notion of distance, but have restrictions on the valid directions of motion. These arise in a natural way in remarkably many settings.

This talk will include a review of Riemannian geometry and an introduction to sub-Riemannian geometry; we'll then introduce the notion of H-type foliations; these are a family of sub-Riemannian manifolds that generalize both the K-contact structures arising in contact geometry and the H-type group structures. Our main focus will be recent results giving uniform comparison theorems for the Hessian and Laplacian on a family of Riemannian metrics converging to sub-Riemannian ones. From this we can conclude a sharp sub-Riemannian Bonnet-Myers type theorem.