Colloquium

University of Notre Dame
Department of Mathematics

Speaker: Demetre Kazaras

Duke University

Will give a lecture entitled
The geometry of scalar curvature and mass in general relativity

Date: Tuesday, January 24, 2023
Time: 4:00 PM
Location: 127 Hayes-Healy Hall

Zoom URL: www.google.com/url?q=https://notredame.zoom.us/j/93770367560?pwd%3DYkMwZ0FsbG9sZmkrM0Q4SUR3ZGFOZz09&sa=D&source=calendar&ust=1670878000972144&usg=AOvVaw3g0JFeTkp_fOWiT7x-VUgI

Departmental Tea: Tea in Room 257 (lounge in Hurley Hall) at 3:30 p.m.

Abstract:

In general relativity, the space we inhabit is modeled by a Riemannian manifold. The fundamental restriction this theory places upon spatial geometry is a lower bound on this manifold's scalar curvature. It is an essential problem in pure geometry to understand the geometric and topological features of this condition. For instance, if a manifold has positive scalar curvature, what may we conclude about the lengths of its curves, the areas of its surfaces, and the topology of the underlying manifold? I will explain many results in this direction, and sketch proofs by analyzing objects I call 'spacetime harmonic functions.' Leveraging these new ideas, I will also describe progress on geometric versions of the following questions: How flat is a gravitational system with little total mass? How can we tell when matter will coalesce to form a black hole?

Demetre Kazaras - Duke University