
New trends in Analysis
Nouvelles tendances en matière d'analyse
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FRANCISCO TORRES DE LIZAU, Universidad de Sevilla

ROBERT HASLHOFER, University of Toronto
Free boundary minimal disks in convex balls

The classical Lusternik-Schnirelman theorem says that any 2-sphere equipped with an arbitrary metric contains at least 3 embedded geodesic loops. Moving up one dimension, Yau asked about the existence of multiple embedded minimal surfaces of simple topology, namely minimal 2-spheres in 3-spheres or minimal 2-disks in 3-balls. In this talk, I will discuss joint work with Dan Ketover, where we show that every strictly convex 3-ball with nonnegative Ricci-curvature contains at least 3 embedded free boundary minimal 2-disks for any generic metric, and at least 2 solutions even without genericity assumption. Our approach combines ideas from min-max theory, geometric flows, and degree theory.

DMITRY JAKOBSON, McGill
Nodal solutions of Yamabe equations and curvature prescription

We discuss several old and new results about conformal invariants arising from nodal solutions of Yamabe type equations, and applications to curvature prescription

DAN MANGOUBI, Einstein Institute of Mathematics

ALBA DOLORES GARCÍA RUIZ, CUNEF Universidad

BRUNO STAFFA, Rice University

JOHN TOTH, McGill University

JÉRÔME VETOIS, McGill University
Nonexistence of extremals for the second conformal eigenvalue in low dimensions

In this talk, we will consider the second conformal eigenvalue on a closed Riemannian manifold of positive Yamabe type and dimension greater than or equal to 3. The second conformal eigenvalue is defined as the infimum of the second eigenvalue of the conformal Laplacian in a conformal class of metrics with renormalized volume. We will discuss a recent result showing that this infimum is not attained for metrics close to the round metric on the sphere in dimensions 3 to 10, which contrasts

sharply with the situation in dimensions greater than or equal to 11, where Ammann and Humbert obtained the existence of minimizers on any closed nonlocally conformally flat manifold. This is a joint work with Bruno Premoselli (Université Libre de Bruxelles).