

Mathematics Colloquium

Friday, January 17th @ 4:00 pm -- PS 307

Einstein solvmanifolds of negative Ricci curvature: new examples



By: Megan Kerr,

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I will describe recent results constructing explicit new examples of non-symmetric Einstein solvmanifolds, as well as some of their geometric features. The method is a combination of two techniques. The first is due to H. Tamaru, who obtains new "attached" Einstein solvmanifolds, submanifolds (although not totally geodesic) of noncompact symmetric spaces. By combining Tamaru's construction with a method due to Carolyn Gordon and M. Kerr, we create Einstein solvmanifolds "associated" to the "attached" solvmanifolds. These new examples are no longer contained in symmetric spaces. With each technique, the (constant) Ricci curvature is preserved, even though the algebra and geometry change.

Professor Kerr: My area of research is Riemannian geometry, specifically the global geometry of Lie groups. I am interested in invariant structures, such as Einstein metrics, on homogeneous and low-cohomogeneity manifolds. I work in the area of global differential geometry. Geometry is the study of the shapes of manifolds, which are generalized surfaces. I consider a special class of manifolds with a high degree of symmetry, called homogeneous and low-cohomogeneity spaces. My work involves varying the shape of a given manifold so that the symmetries, or most of them, remain. This work harnesses the interactions of the analytic notion of curvature with the algebraic structure of Lie groups. Most of my results involve finding new examples in settings where the "big questions" are about the existence of examples: What kinds of examples arise? Why are they rare? What are the obstructions? I am an active member of the Association for Women in Mathematics (recently served terms on the Schafer prize selection committee and JMM workshop organizing committee). Through the AWM I have enjoyed meeting and working with successful women mathematicians in a broad range of research areas and at a variety of universities and colleges. Doing mathematics is a terrific way to see the world. Recent conferences have taken me to San Francisco, Middlebury, Aspen, Rio de Janeiro, and Cuernavaca.

For Colloquium attendees, refreshments will be served in PS 317 at 3:30 pm