Department of Mathematical Sciences welcomes

Steve Hurder
University of Illinois at Chicago

Geometry and Dynamics of Solenoids

ABSTRACT:

A classical solenoid is the space obtained by considering the result of taking an infinite sequence of finite coverings of the circle. Classical solenoids, such as the Smale solenoid, arise naturally as invariant sets in the dynamics of a perturbation of a flow with periodic orbits, and are well-understood. In this talk, we will consider the problem of understanding the properties of solenoids obtained by considering the limit of sequences of finite coverings of a higher dimensional manifold M. As it turns out, this problem is not so simple! Their study takes us into the world of group actions on Cantor sets corresponding to group actions on rooted trees, and the algebraic structure of pro-finite groups. The study of these Cantor dynamical systems reveals unexpected phenomena, including wild actions which have non-Hausdorff qualities, and the properties of arboreal actions of absolute Galois groups associated to number fields.

ABOUT THE SPEAKER:

The speaker got his doctorate from the University of Illinois at Urbana Champaign in 1980, on a topic combining the classification of foliations with methods of rational homotopy theory. He was a postdoc at the Institute for Advanced Study in 1980-81, an Instructor at Princeton University from 1981-83, and an MSRI Fellow from 1983-85. He has been a faculty member at the University of Illinois at Chicago ever since, though with more than 20 Invited Visiting Positions at various universities in Europe and Japan during this time. He received the Sloan Fellowship in 1985, was a University Scholar at UIC in 1991-94, and was in the first class of AMS Fellows in 2012. Besides mathematics, he enjoys gardening, and his annual production of "hot pepper sauce" featuring home-grown ghost peppers, and occasionally ghost brownies, is a much anticipated autumnal event for the staff in the department.

October 19, 2018

Hosted by:
Prof. Bruce Kitchens

Tea begins at 2:30
in LD 259

Research Topic
begins at 3:00
in LD 229

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