

## MATH-IMS Joint Colloquium Series The Chinese University of Hong Kong

*This MATH-IMS Joint Colloquium Series in pure mathematics is organized by the Department of Mathematics and the Institute of Mathematical Sciences (IMS) at the Chinese University of Hong Kong. The series focus on all areas of pure mathematics together with theoretical developments and applications.*

**Date:** March 31, 2021 (Wednesday)

**Time:** 10:00am – 11:00am (Hong Kong Time)

**Zoom Link:** <https://cuhk.zoom.us/j/98846779826>

### Using foliations to understand manifolds

*Speaker: Professor Rachel Roberts*

*Washington University in Saint Louis*

**Abstract:** One approach to understanding a complicated object involves breaking the object into simpler pieces that fit back together in constrained ways. In this talk, the complicated object is an  $n$ -manifold, and the simpler pieces are obtained from foliations, in various ways, including foliation charts, leaves of a foliation, branched surfaces, and sutured manifolds. Work of Thurston in the 1970s highlighted the power of codimension one. More recently, the Floer homology theories have led to new insights. After introducing the definition of foliation and describing some basic foliation results, I will specialize to the special case of codimension one foliations in 3-manifolds. Included in the discussion will be results of Gabai, Thurston, Eliashberg-Thurston, Bowden, Kazhdan-R, and Delman-R.

**Bio:** Prof. Roberts received her Ph.D. degree from Cornell University under the direction of Prof. Allen Hatcher. After that she has been an Harry Bateman instructor in Mathematics at California Institute of Technology, and held postdoc fellowships from the National Science Foundation and MSRI. She moved to the Washington University in St Louis in 1995, where she is now Elinor Anheuser Professor of Mathematics. She was a Simons Visiting Professor at University of Warwick and Oberwolfach.