COLLOQUIUM

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Coarse geometry and rigidity

Mathematics and Statistics
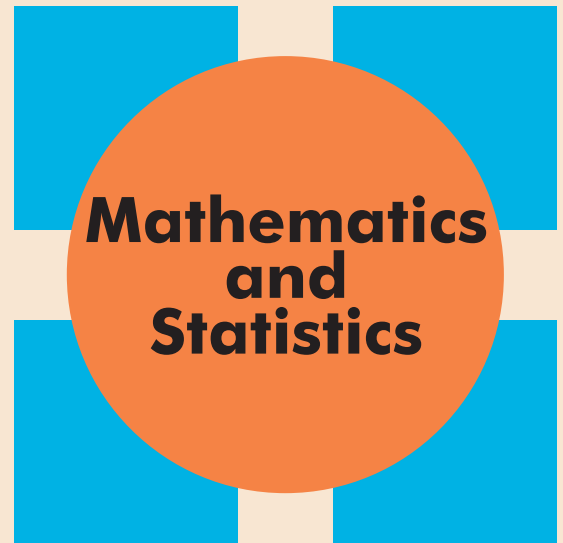
Date: Friday September 10, 2021
Time: 3:30 PM
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Abstract: Coarse geometry is the study of metric spaces when one forgets about the small scale structure and focuses only on the large scale. For example, this philosophy underlies much of geometric group theory. To a coarse space one associates an algebra of operators on a Hilbert space, called the uniform Roe algebra. No familiarity with coarse geometry, operator algebras, or logic is required. After introducing the basics of coarse spaces and uniform Roe algebras, we will consider the following rigidity questions:

(1) If the uniform Roe algebras associated to coarse spaces X and Y are isomorphic, when can we conclude that X and Y are coarsely equivalent?

(2) The uniform Roe corona is obtained by modding out the compact operators. If the uniform Roe coronas of X and Y are isomorphic, what can we conclude about the relation between the underlying uniform Roe algebras (or about the relation between X and Y)?

The answers to these questions are fairly surprising. This talk is based on a joint work with F. Baudier, B.M. Braga, A. Khukhro, A. Vignati, and R. Willett.

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