Department of Mathematics and Statistics

COLLOQUIUM

Monday, October 8, 2012

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Smooth vs. discrete Morse theory

Abstract: Morse theory (by Marston Morse, around 1935) analyzes any smooth manifold by looking at an arbitrary smooth function defined on it. Discrete Morse Theory (by Robin Forman, around 2000) is more elementary: It works on simplicial complexes, and it allows to "simplify" them without changing the homotopy. Both theories are used in a variety of applications, for example in shape recognition.

Since every smooth manifold can be triangulated (which means, one can find a simplicial complex homeomorphic to it), we may compare the two theories on the common battleground of "triangulations of manifolds". For example, both theories yield upper bounds for the Betti numbers (via the so-called Morse inequalities). Which of the two theories gives sharper bounds?

This is partly joint work with Karim Adiprasito.

4:00 – 5:00 pm
Adel Math Bldg, Room 164

Refreshments at 3:45

Weekly seminars:
Algebra, Combinatorics, Geometry, Topology (ACGT) Seminar:
Tuesday, October 9, 12:45 – 2:00 pm, AMB 164. Speaker: TBA, Title: TBA.

Applied Mathematics Seminar:
Thursday, October 11, 12:45 – 1:45, AMB 164. Speaker: TBA, Title: TBA.

Friday Afternoon Undergraduate Mathematics Seminar (FAMUS):
Friday, October 12, 3:00 – 4:00 pm, AMB 164. (refreshments)