

Mathematics Colloquium at IUB

DANIEL GRIESER

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will speak on

*Eigenvalue Estimates, Isoperimetric Inequalities
and Flows in Networks*

Date: Monday, October 10, 2005

Time: 17:15

Place: Lecture Hall Research II, IUB

Abstract:

The Laplace operator is a basic object in analysis, differential geometry, probability theory, quantum mechanics, as well as graph theory (in its discrete form). A central problem is the determination, or at least estimation, of its lowest eigenvalue in terms of the ‘geometry’ of the space on which the Laplacian is defined. One such estimate is ‘Cheeger’s inequality’, which relates the lowest eigenvalue to a quantity h which closely resembles the classical isoperimetric constant. In this talk I will give a new perspective on this quantity h by relating it to the problem of flowing a maximum amount of fluid through the space given certain local capacity constraints. This relation involves a continuous analogue of the classical Max Flow Min Cut Theorem in network theory. From this new perspective we get effective ways of estimating h and new proofs of Cheeger’s inequality as well as inequalities of the lowest eigenvalue in terms of the inradius.

Colloquium Tea at ca. 16:45 in the Tea Room of Research II, close to the lecture hall. Everybody is welcome!

M. STOLL