PIMS Applied Mathematics Seminar Series

Tuesday
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University of Saskatchewan
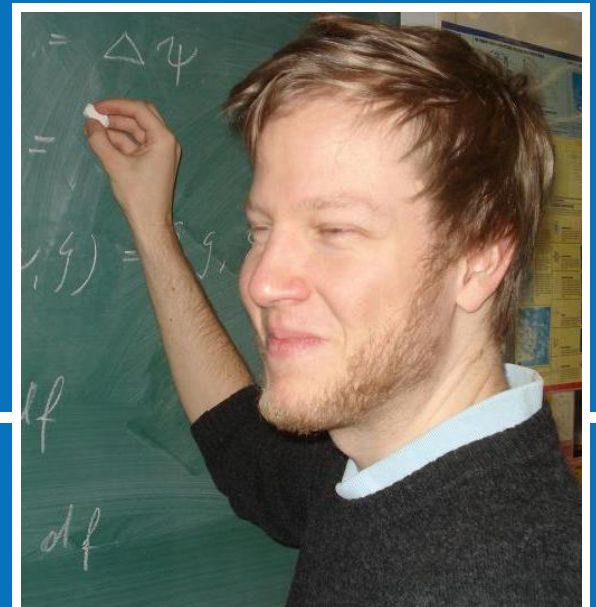
ARTS Building
101 Room
3:30 PM

Novel methods for geometric numerical integration

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Abstract:

Many models describing physical phenomena are in the form of nonlinear differential equations that are challenging to solve analytically and thus have to be solved numerically. Standard numerical techniques often do not capture essential geometric properties of these models and thus important features are lost when they are discretized. Preserving geometric properties of models numerically is necessary when long time integrations are required. Methods that preserve them are called geometric numerical integrators. They play an important role in fields such as astronomy, molecular dynamics and climate prediction. In this talk I will present methods for the construction of geometric integrators. I will show several examples for such integrators with relevance in fluid mechanics and classical physics.

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