

# Groupoids in Analysis and Geometry Seminar

Organizer(s): Calder Daenzer, Calvin Moore, Martin Olsson & Alan Weinstein

Tuesday, 2:10–5:00pm, 939 Evans

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May 20     **2:10–3:00, Yvette Kosmann-Schwarzbach**, Ecole Polytechnique

*Nijenhuis tensors for Courant algebroids*

**\*Note special day and time\***

We shall review the definition of the Nijenhuis torsion for endomorphisms of the generalized tangent bundle of a manifold and, more generally, of a Courant algebroid, and we shall show how Nijenhuis tensors give rise to deformed brackets.

**4:10–5:00, John Baez**, UC Riverside

*Groupoidification*

**\*Note special day and time\***

There is a systematic process that turns groupoids into vector spaces and spans of groupoids into linear operators. “Groupoidification” is the attempt to reverse this process, taking familiar structures from linear algebra and enhancing them to obtain structures involving groupoids. Like quantization, groupoidification is not entirely systematic. However, examples show that it is a good thing to try! For example, groupoidifying the quantum harmonic oscillator yields combinatorial structures associated to the groupoid of finite sets. Groupoidifying the  $q$ -deformed oscillator yields combinatorial structures associated to finite-dimensional vector spaces over the field with  $q$  elements. We can also groupoidify some mathematics related to quantum groups and representations of finite groups. We first describe the basic ideas, and then as many examples as time permits.