Projects for 6333

1.1. ***Gerbes and bundle gerbes; higher bundle gerbes [Ramiro]***

Background material (simplicial presheaves):
- Daniel S. Freed, Michael J. Hopkins: Chern–Weil forms and abstract homotopy theory, Sections 1–6
- Domenico Fiorenza, Urs Schreiber, Jim Stasheff: Čech cocycles for differential characteristic classes: an ∞-Lie theoretic construction, Section 3
- James Simons, Dennis Sullivan: Axiomatic characterization of ordinary differential cohomology

1.2. ***Foliations [Nilan]***

- Ieke Moerdijk, Janez Mrčun: Introduction to foliations and Lie groupoids
- David Carchedi: On the homotopy type of higher orbifolds and Haefliger classifying spaces
- André Haefliger: Homotopy and integrability

1.3. ***Higher gauge theory [Stephen]***

- John C. Baez, Urs Schreiber: Higher gauge theory
- John C. Baez, John Huerta: An invitation to higher gauge theory

Examples: magnetic currents as a bundle gerbes with connection; Kalb-Ramond fields; supergravity C-fields; Ramond–Ramond fields as cocycles in differential K-theory

Projects for 6332

2.1. *The string Lie 2-group*

- Christopher Schommer-Pries: Central extensions of smooth 2-groups and a finite-dimensional string 2-group
- Konrad Waldorf: A construction of string 2-group models using a transgression-regression technique

2.2. L_∞-*algebras*

- Hisham Sati, Urs Schreiber, Jim Stasheff: L_∞-Algebra Connections and Applications to String- and Chern–Simons n-Transport

2.3. *Principal ∞-bundles*

- Thomas Nikolaus, Urs Schreiber, Danny Stevenson: Principal ∞-bundles (3 papers)

2.4. *Chern–Simons and Wess–Zumino–Witten theory*

- Domenico Fiorenza, Urs Schreiber, Jim Stasheff: Čech cocycles for differential characteristic classes: an ∞-Lie theoretic construction.
- Domenico Fiorenza, Urs Schreiber, Jim Stasheff: Extended higher cup-product Chern–Simons theory
- Domenico Fiorenza, Urs Schreiber, Jim Stasheff: A higher stacky perspective on Chern–Simons theory
- Alan Carey, Stuart Johnson, Michael Murray, Danny Stevenson, Bai-Ling Wang: Bundle gerbes for Chern–Simons and Wess–Zumino–Witten theories

2.5. *Differential characteristic classes*

- Daniel S. Freed, Michael J. Hopkins: Chern–Weil forms and abstract homotopy theory
- Domenico Fiorenza, Urs Schreiber, Jim Stasheff: Čech cocycles for differential characteristic classes: an ∞-Lie theoretic construction.

2.6. *Differential K-theory and its applications to physics [Ramiro]*

- Daniel Grady, Hisham Sati: Differential KO-theory: constructions, computations, and applications
- Daniel S. Freed, Michael Hopkins: On Ramond-Ramond fields and K-theory
- Jacques Distler, Daniel S. Freed, Gregory W. Moore: Orientifold précis (talk to Dan Grady about this paper)
- Richard J. Szabo: Quantization of Higher Abelian Gauge Theory in Generalized Differential Cohomology