



**Speaker:** Ezra Getzler  
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Tuesday, February 24, 2015  
3:00 PM  
258 Hurley Hall

**Title:** Towards a symplectic form on the derived stack of perfect complexes

**Abstract:**

Shulman (following ideas of Bott) constructed closed differential forms in the total de Rham complex of the nerve of a compact Lie group which realize the Chern-Weil correspondence. (In the case of  $U(n)$ , these classes lift to differential characters by the work of Cheeger and Simons: it would be very interesting to extend this to all groups. This has been done for classes in  $H^4$  when  $G$  is simple by Gawedzki and collaborators, where this problem is seen as corresponding to quantization of the so-called WZW model.) Shulman's main theorem is that the differential form associated to an invariant polynomial of degree  $k$  is, in the terminology of Pantev, Toën, Vacquié and Vezzosi, a form of degree  $2k$  in the complex of closed  $k$ -forms.

The second Chern class defines a “shifted symplectic form” on this stack. Toën and Vezzosi have extended this class to the derived stack where one considers not the groupoid of isomorphisms between vector spaces, but rather the higher groupoid of quasi-isomorphisms between perfect complexes. Their proof of its existence invokes Lurie’s proof of the cobordism hypothesis. In this talk, I describe partial results in constructing this form explicitly.