

University of Notre Dame Department of Mathematics  
**SPECIAL LECTURE SERIES**

**Moritz Groth**

University of Bonn, Germany

*Will give a lecture entitled:*

A Short Course on  $\infty$ -Categories

*On*

Monday, September 6, 2010

*At*

1:45 PM

*In*

258 Hurley Hall

***Abstract***

This is a short series of talks on some aspects of the theory of  $\infty$ -categories as studied intensively by Joyal and Lurie. The theory of  $\infty$ -categories is a model for a theory of  $(\infty, 1)$ -categories and there is a close relation to other approaches as there are, e.g., model categories and simplicially enriched categories. In this series, we sketch some of the central constructions one can perform with  $\infty$ -categories and describe the relation to simplicially enriched categories and model categories.

**Talk 1:** We introduce  $\infty$ -categories and examine some consequences which result immediately from the inner horn filling condition. Important examples for  $\infty$ -categories are ordinary categories and Kan complexes. Moreover, we will see that every  $\infty$ -category has an associated homotopy category. We then turn shortly to simplicially enriched categories and sketch how these are related to  $\infty$ -categories via the coherent nerve construction.