



# THEMATIC PROGRAM ON CALABI-YAU VARIETIES: ARITHMETIC, GEOMETRY AND PHYSICS

## Workshop 4: Hodge Theory in String Theory

**ORGANIZERS** Charles Doran (Alberta), Radu Laza (Stony Brook), David Morrison (Santa Barbara),  
Johannes Walcher (McGill)

**November 18–22, 2013**  
**FIELDS INSTITUTE, ROOM 230**

Hodge theory has played an important role in understanding the interaction between mathematics and physics over the past two decades. For instance, the predictions of mirror symmetry can be understood as expansions of the period integrals at the boundary of the moduli space of complex structures. This workshop aims to survey and explore the interaction between Hodge theory and physics in the understanding of Calabi-Yau varieties. Specifically, we focus on the study of moduli spaces of Calabi-Yau varieties and their compactifications from the perspective of period maps, with applications to various string dualities. Conversely, we expect that ideas from physics will lead to new insights on the mathematical side.

Topics will include (but not limited to):

- Degenerations of Hodge structures
- Compactifications of period domains
- Period maps, Picard-Fuchs differential equations
- Hodge theory and algebraic cycles
- Arithmetic properties of periods
- String theory and Hodge theory

### CONFIRMED SPEAKERS

Matthew Ballard (South Carolina)  
Charles Doran (Alberta)  
Michael Dettweiler (Bayreuth)  
Alice Garbagnati (Milano)  
Ludmil Katzarkov (Miami)  
Matt Kerr (Washington U. St. Louis)  
Anca Mustata (Cork)  
Kefeng Liu (UCLA)  
David Morrison (Santa Barbara)  
Hossein Movasati (IMPA)  
Greg Pearlstein (Texas A & M)  
Chris Peters (Grenoble)  
Giulia Sacca (Stony Brook)  
Sampei Usui (Osaka)  
Claire Voisin (Jussieu)  
Johannes Walcher (McGill)  
Kang Zuo (Mainz)



This is a joint workshop with  
PIMS CRG Program “Geometry  
and Physics”.

There will be a concentrated graduate course the week of November 11 at the Fields Institute prior to workshop 4.

The Coxeter Lecture Series by Claire Voisin will take place November 13, 14 and 18, 2013 at the Fields Institute.

The schedule for the concentrated graduate course and for the workshop as well as titles and abstracts of talks will be posted on the Fields program webpage.

For more information, please visit:

**[www.fields.utoronto.ca/programs/scientific/13-14/calabi-yau](http://www.fields.utoronto.ca/programs/scientific/13-14/calabi-yau)**



The Fields Institute for Research in Mathematical Sciences

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