# Generalized Geometry and String Theory
# Dec. 2-Dec. 7, 2012

## MEALS

*Breakfast (Buffet): 7:00–9:30 am, Sally Borden Building, Monday–Friday
*Lunch (Buffet): 11:30 am–1:30 pm, Sally Borden Building, Monday–Friday
*Dinner (Buffet): 5:30–7:30 pm, Sally Borden Building, Sunday–Thursday
Coffee Breaks: As per daily schedule, in the foyer of the TransCanada Pipeline Pavilion (TCPL)
***Please remember to scan your meal card at the host/hostess station in the dining room for each meal.**

## SCHEDULE

### Sunday

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| **16:00** | Check-in begins (Front Desk - Professional Development Centre - open 24 hours) |
| **17:30–19:30** | Buffet Dinner, Sally Borden Building |
| **20:00** | Informal gathering in 2nd floor lounge, Corbett Hall (if desired)<br>Beverages and a small assortment of snacks are available on a cash honor system. |

### Monday

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| **7:00–8:45** | Breakfast |
| **8:45–9:00** | Introduction and Welcome by BIRS Station Manager, TCPL |
| **9:00-10:00** | Li-Sheng Tseng, "Lefschetz maps and symplectic compactifications" |
| **10:00-10:30** | Coffee Break, TCPL |
| **10:30-11:30** | Daniel Waldram, ""Hypermultiplet structures" and moment maps for generalised diffeomorphisms" |
| **11:30–13:00** | Lunch |
| **13:00–14:00** | Guided Tour of The Banff Centre; meet in the 2nd floor lounge, Corbett Hall |
| **14:00** | Group Photo; meet in foyer of TCPL (photograph will be taken outdoors so a jacket might be required). |
| **14:15-15:15** | Washington Taylor, "Global aspects of F-theory and elliptically fibered Calabi-Yau manifolds" |
| **15:15-15:30** | Coffee Break, TCPL |
| **15:30-16:30** | Allan Adams |
| **17:30–19:30** | Dinner |

### Tuesday

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|---|---|
| **7:00–9:00** | Breakfast |
| **9:00-10:00** | Eric Sharpe, "Abelian GLSM's, gerbes, and homological projective duality" |
| **10:00-10:30** | Coffee Break, TCPL |
| **10:30-11:30** | Ilarion Melnikov, "(0,2) Moduli" |
| **11:30–13:30** | Lunch |
| **13:30-14:30** | Savdeep Sethi, "Target spaces from chiral gauge theory" |
| **14:30-15:00** | Coffee Break, TCPL |
| **15:00-16:00** | Nick Halmagyi, "Aspects of BPS, AdS4 black holes" |
| **17:30–19:30** | Dinner |

**Wednesday**

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|---|---|
| **7:00–9:00** | Breakfast |
| | Free Morning |
| **11:30–13:30** | Lunch |
| **13:30-14:30** | Rafael Torres, "Generalized complex structures of different type" |
| **14:30-15:00** | Coffee Break, TCPL |
| **15:00-16:00** | Philip Candelas, "An Abundance of K3 Fibrations from Polyhedra with Interchangeable Parts" |
| **17:30–19:30** | Dinner |
| **19:30-20:30** | David Berman |
| **20:30-21:30** | Alessandro Tomasiello, "A Geometric Classification of Supersymmetric Solutions in String Theory" |

**Thursday**

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|---|---|
| **7:00–9:00** | Breakfast |
| **9:00-10:00** | Ruben Minasian, "Higher derivative couplings and the B-field" |
| **10:00-10:30** | Coffee Break, TCPL |
| **10:30-11:30** | Sheldon Katz, "Log Calabi-Yau spaces and a new weak coupling limit of F-theory" |
| **11:30–13:30** | Lunch |
| | Free Afternoon |
| **17:30–19:30** | Dinner |
| **19:30-20:30** | Josh Lapan |
| **20:30-21:30** | Marco Gualtieri, "Deformations of generalized Kahler manifolds" |

**Friday**

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|---|---|
| **7:00–9:00** | Breakfast |
| | Informal discussion |
| **11:30–13:30** | Lunch |
| **Checkout by 12 noon.** | |

** 5-day workshop participants are welcome to use BIRS facilities (BIRS Coffee Lounge, TCPL and Reading Room) until 3 pm on Friday, although participants are still required to checkout of the guest rooms by 12 noon. **

# Generalized Geometry and String Theory
# Dec. 2-Dec. 7, 2012

**ABSTRACTS**
**(in alphabetic order by speaker surname)**

Speaker: **Allan Adams** (MIT)
Title:
Abstract:

Speaker: **David Berman** (Queen Mary, University of London)
Title:
Abstract:

Speaker: **Philip Candelas** (Oxford)
Title: *An Abundance of K3 Fibrations from Polyhedra with Interchangeable Parts*
Abstract:

Speaker: **Marco Gualtieri** (University of Toronto)
Title: *Deformations of generalized Kahler manifolds*
Abstract: I will describe an explicit construction of generalized Kahler manifolds which takes advantage of their inherent holomorphic Poisson and Dirac geometry.

Speaker: **Nick Halmagyi** (Universite Paris VI)
Title: *Aspects of BPS, AdS4 black holes*
Abstract:

Speaker: **Sheldon Katz** (University of Illinois)
Title: *Log Calabi-Yau spaces and a new weak coupling limit of F-theory*
Abstract:

Speaker: **Josh Lapan** (McGill University)
Title:
Abstract:

Speaker: **Ilarion Melnikov** (Max Planck Institute for Gravitational Physics (Albert Einstein Institute))
Title: *(0,2) Moduli*
Abstract:

Speaker: **Ruben Minasian** (CEA Saclay)
Title: *Higher derivative couplings and the B-field*
Abstract: I'll discuss how the presence of B-field changes the bulk (IIA - one loop) and D-brane couplings involving the powers of curvature tensor.

Speaker: **Savdeep Sethi** (University of Chicago)
Title: *Target spaces from chiral gauge theory*
Abstract:

Speaker: **Eric Sharpe** (Virginia Tech)
Title: *Abelian GLSM's, gerbes, and homological projective duality*
Abstract:

Speaker: **Washington Taylor** (MIT)
Title: *Global aspects of F-theory and elliptically fibered Calabi-Yau manifolds*
Abstract:

Speaker: **Alessandro Tomasiello** (Universita‘ di Milano-Bicocca)
Title: *A Geometric Classification of Supersymmetric Solutions in String Theory*
Abstract: I will show how to apply the techniques of generalized complex geometry to any ten-dimensional supersymmetric solution (not necessarily involving a factor with an $AdS_4$ or $Minkowski_4$ metric) in type II theories. I will describe a system of differential equations in terms of a form describing a generalized ISpin(7) structure. This system is equivalent to unbroken supersymmetry. One of the equations reproduces all the pure spinors equations for four-dimensional vacua. I will also comment on work in progress to compare the new system to N=2 gauged supergravity in four dimensions.

Speaker: **Rafael Torres** (Oxford)
Title: *Generalized complex structures of different type*
Abstract: The canonical bundle of a generalized complex structure is generated by a complex differential form (subject to certain requirements). The type of the structure is determined locally by such a form. An interesting trait is that the type need not be globally constant on a generalized complex manifold, but it might jump along a submanifold known as the type change locus. In this talk, we will discuss generalized complex structures of different types in dimension four. Examples of structures with arbitrarily many type change loci will be constructed.

Speaker: **Li-Sheng Tseng** (University of California Irvine)
Title: *Lefschetz maps and symplectic compactifications*
Abstract:

Speaker: **Daniel Waldram** (Imperial College London)
Title: *"Hypermultiplet structures" and moment maps for generalised diffeomorphisms*
Abstract: We introduce a new structure in exceptional generalised geometry that extends the notion of generalised complex geometry. It is defined in 4,5,6 and 7 dimensions and includes examples of symplectic, complex, contact and hyper-Kahler geometries. Physically it describes the hypermultiplet degrees of freedom in generic theories with 8 supercharges arising in flux compactifications of type IIA or IIB or eleven-dimensional supergravity. Remarkably, the integrability conditions are given by moment maps for the group of generalised diffeomorphisms – the symmetries of the corresponding exceptional Courant bracket.