



# GEOMETRY, TOPOLOGY, AND PHYSICS SEMINAR

## Exact half-BPS solutions to type IIB supergravity

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Friday, November 2, 2007, 4:00 p.m.  
Room 6635 South Hall

**Abstract:** The complete Type IIB supergravity solutions with 16 supersymmetries are obtained on the manifold  $AdS_4 \times S^2 \times S^2 \times \Sigma$  with  $SO(2,3) \times SO(3) \times SO(3)$  symmetry in terms of two holomorphic functions on a Riemann surface  $\Sigma$ , which generally has a boundary. This is achieved by reducing the BPS equations using the above symmetry requirements, proving that all solutions of the BPS equations solve the full Type IIB supergravity field equations, mapping the BPS equations onto a new integrable system akin to the Liouville and Sine-Gordon theories, and mapping this integrable system to a linear equation which can be solved exactly. Amongst the infinite class of solutions, a non-singular Janus solution is identified which provides the AdS/CFT dual of the maximally supersymmetric Yang-Mills interface theory discovered recently. We outline the construction of general classes of globally non-singular solutions, including fully back-reacted  $AdS_5 \times S^5$  and supersymmetric Janus doped with D5 and/or NS5 branes.

Information about future meetings of this seminar can be found at  
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