

## ***"Exploiting Structural Indeterminacy: Thrust Network Analysis for 3-D Equilibrium"***

Friday, November 14  
12:30 - 2:00pm  
Room 3-133

### **Philippe Block**

PhD candidate in Building Technology  
Department of Architecture, MIT

#### *Abstract*

This lecture presents a new computational form-finding method for exploring three-dimensional equilibrium shapes. Through the use of intuitive graphical methods, the designer gains control over the exploration of form, which blurs the boundaries between funicular and free-form design. Several projects will demonstrate the power of this innovative method for the safety assessment of historic vaults with complex geometries in unreinforced masonry and for the design exploration of funicular (axial-force only) shapes. A pavilion in Austin, TX illustrates the process of designing, engineering, proto-typing, fabricating and constructing a new structural vault in stone. This project demonstrates the power of Thrust Network Analysis (TNA) for structurally informed, but surprising design explorations.

#### *Bio*

Philippe Block is an architectural engineer trained at the Vrije Universiteit Brussel (2003) and at MIT (SMArchS 2005). He worked as a visiting researcher at the Royal Danish Academy of Arts in Copenhagen (Fall 2007) and at the Institute for Lightweight Structures and Conceptual Design (ILEK) in Stuttgart (Spring 2008). He has won numerous awards for his research, including the Hangai Prize from the International Association of Shell and Spatial Structures in 2007.