



# Penn Design

**April 3-4**  
**Nonlinear Fabrication**  
*Strange Loops in the Product's Lifecycle*

# University of Pennsylvania

PennDesign, Dept. of Architecture

*This event has been made possible through the generous support of Bentley Systems and PennDesign.*

## The N<sub>1</sub>S<sub>0</sub> Annual Conference

[www.nso.penndesign.net](http://www.nso.penndesign.net)

### April 3

**Thursday 6:30pm, Wu & Chen Auditorium  
Levine Hall, UPenn**

Opening Remarks: Cecil Balmond

**Keynote Lecture: Manuel DeLanda**

*Please join us after the lecture to celebrate Cecil Balmond's new book, Element.*

### April 4

**Friday 9am, Upper Gallery  
Meyerson Hall, UPenn**

**9:00am-11:00am**

**Current Research at the N<sub>1</sub>S<sub>0</sub>**

Moderator: Cecil Balmond

Participants: Jenny Sabin and Ferda Kolatan (N<sub>1</sub>S<sub>0</sub> Senior Researchers), Peter Jones (N<sub>1</sub>S<sub>0</sub> Fellow), Winka Dubbeldam (Archi-Tectonics) Anne Plant (NIST), Roland Snooks (Kakkugia), Theo Spyropoulos (AA DRL)

**11:15am-1:30pm**

**Without Tools, the Future of Fabrication**

Moderator: David Ruy

Participants: Behrokh Khoshnevis (USC, Center for Rapid Automated Fabrication Technologies), Andrew Snow (EOS), Marcelo Spina (Patterns), Peter Testa (Testa & Weiser), Chris Tuck (Rapid Manufacturing Research Group, Loughborough University), Tom Wiscombe (Emergent)

**3:00pm-4:15pm**

**Closing Comments**

Moderators: Cecil Balmond and David Ruy

Participants: William Braham, Winka Dubbeldam, Behrokh Khoshnevis, Dettlef Mertins, Anne Plant, Theo Spyropoulos, Peter Testa, Chris Tuck, Tom Wiscombe

## Nonlinear Fabrication

*Strange Loops in the Product's Lifecycle*

Though matter itself has always found its expressions through nonlinear organizations, architecture's modes of intervention in the life of matter have been linear and willful. As architecture continues its age-old struggles against material realities, the future holds astonishing possibilities as we slowly discern the nuances of complex material organizations and cultivate new regimes of expression. Rather than superimposing design on the inscrutable patterns of a complex material history, the most optimistic cases in material practices today are characterized by a shift towards a collaboration with the material world.

Though digital fabrication technologies have been celebrated as ever more efficient ways to conduct business as usual, the convergence of computation, life sciences, and radical new experiments in material research points to a far less predictable future for design culture. 3d printing a building, manufacturing without tooling, weaving and braiding composite materials to form a structural system, designing building components with intelligent agents, are some of the astonishing projects being investigated today. This year's conference evaluates the NSO's ongoing research into "Nonlinear Fabrication" and opens the discussion to the frontiers of material practice.

[front image, False color image of 2-D Stress Chain Experiment, Dan Howell at Duke Physics]