



# Rational Form Finding

FALL 2019 OPTION STUDIO  
ANGELA PANG with guest lecturer YOSHIYUKI HIRAIWA

In search of freedom in aesthetics, the disciplines of architecture and structural design have always worked hand in hand in expanding new possibilities for form finding and space making. Rationale is the basis in modernist's approach to architecture, tracing back to the traditions of logic and order of Greek and Renaissance architecture. There have been two major trajectories in structural design in the period since World War II. The first is the gradual reduction of mass, as exemplified in the Domino House and the Miesian language. The other is the transition from clear Euclidean geometries in spatial structures (such as the Pantheon) to a return of naturalism and free forms.

Optimization precedes superfluous forms. This studio highlights the collaboration between architects and structural designers in the pursuit of possibilities of form finding. The dominant value in this collaborative relationship has been that of structural rationalism, as expounded upon by the work of Brunelleschi and Viollet-le-Duc. We hope students will learn from this studio the possibilities of close integration between structural concept and architectural design, contrary to the conventional practice of a linear progress from architect's imagery to structural engineer's implementation. Our goal for the studio is for students to discover the differences between geometry-based form making versus structurally-based rational form finding. Structure is not only a problem solving process but a key to new possibility in design.

This research-based studio is organized in three parts:

Part I is a research on precedents of past experiments between form and structure. Study on historical and contemporary precedents draw lessons to be learned. Projects for research may include Gaudi's Sagrada Familia, Candela's Bacardi Bottling Plant, SANAA & Sasaki's Rolex Learning Center at EPFL, Ishigami & Konishi's KAIT Workshop, Nishizawa & Sasaki's Teshima Art Museum, Siza & Balmond Portuguese Expo Pavilion, Ito & Balmond's Taichung Opera house among others. Part II is an experimental workshop. Led by guest lecturer structural engineer Yoshiyuki Hiraiwa from Tokyo, this is a design thinking workshop to test structural concepts learned from research and everyday materials. There will also be a series of talks by Hiraiwa on structural concept design and the relationships with architecture.

The studio will conclude with a design charrette that summarizes the works between research information and experimental knowledge. Emphasizing the importance of experimental explorations on new possibilities in form finding, a pavilion will be designed on neutral ground within the campus.