ARCH 4803/6352/8803 Theory of Architecture II / Special Topics – Fall 2018
College of Architecture / Georgia Institute of Technology
Instructor: Prof. Lars Spuybroek, email: nox@luna.nl
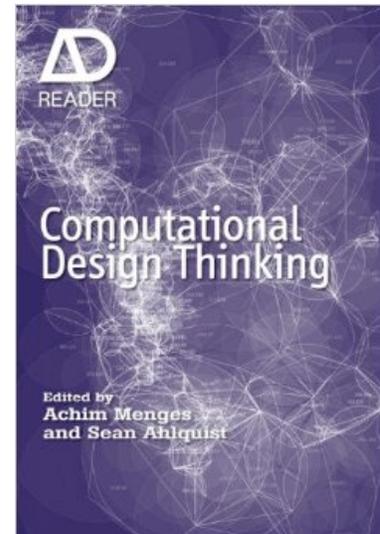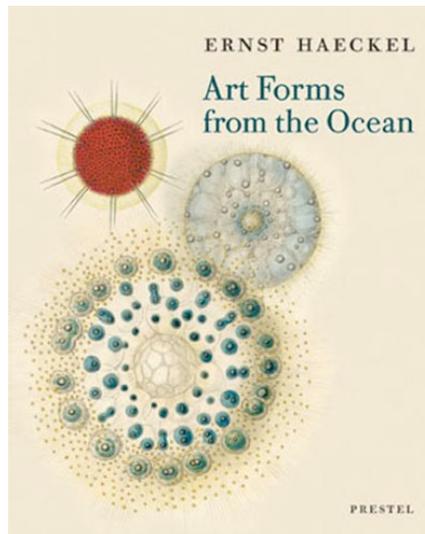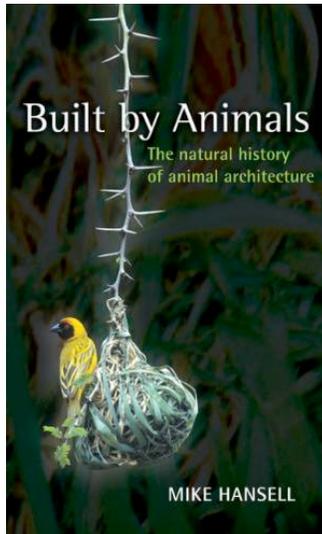Tue/Thu 1.30-2.45PM @ Van Leer E361

Fall 2018 – *Bioconstructivisms: Tinkering vs Engineering*

Structure is usually viewed as clearly defined elements linking up in a state of either tension or compression, where all form simply follows the laws of force. The structures of nature, however, exhibit far greater complexity than any humanly engineered system. Without exception natural structures are in constant temporal development; their parts fulfill many, often conflicting roles simultaneously; and there is enormous redundancy in such systems. When we look at how soap bubbles interact or how the brain grows, how birds build their nests, or how the skin can wrinkle; we always observe the same excessive variation in combination with a rigorous logic.

"Nature is always tinkering," said the evolutionary biologist François Jacob in the early 1970s. The concept of tinkering is based on a constant redefinition and variation of elements. *Bioconstructivism is the art of tinkering: combining logic with vagueness*. This elective discusses the main protagonists of such ideas. We will be looking into early concepts of biomimetics such as Fechner's and Francé's research into plant morphology; the analogue computing techniques of Antoni Gaudi and Frei Otto; the work of Ernst Haeckel who discovered the complexity of Radiolaria; as well as how digital design techniques can both generate and use such complex structures for architectural and engineering solutions. We will see how two worlds that have been separated since ages, art and engineering (*Beaux-Arts* and *Polytechnique*), can be brought together by contemporary forms of biomimetics and digital morphogenesis.

Each student will do six presentations in PowerPoint (minimum 15-20 slides) consisting of (a) a general outline of the author's argument; (b) a slow-paced reconstruction of that argument while using quotes from the texts; (c) diagrams, tables and/or images for clarfication; (d) extra background information of other authors, theories or ideas which the author is refererring to in the text. Both during and after the presentation a discussion emerges between the professor and the students, which can involve the participation of other students.

Lars Spuybroek is Professor of Architecture since 2001 and the author of several books on architecture and digital design. He built the *HtwoOexpo* water pavilion, the *D-tower* and the *Son-O-House*. He also wrote *The Architecture of Continuity* and *The Sympathy of Things*, as well as editing the Research & Design series. His work was exhibited at three Venice Biennales and is part of the permanent collection of the CCA in Montreal a.o.