

# Digital Fabrication & Deployable structures

**Blockseminar:**

Construction of a prototype of a deployable structure  
built with the laser cutter Sabko 1290

**28 Feb - 03 Mar**



Collaborative Design Laboratory  
[www.colab.tu-berlin.de](http://www.colab.tu-berlin.de)

Technische Universität Berlin  
Fak. VI - Institut für Architektur  
FG Architekturdarstellung und Gestaltung

Sekr. A28, Raum A812  
T: +49 [0] 30-314-72730  
Straße des 17. Juni 152, 10623 Berlin



# DEPLOYABLE HABITAT

## Objective

The main objective of this seminar is to design and build different prototypes of deployable structures that can colonize a space to be inhabited temporarily.

Both the notion of inhabiting as the development of deployable structures imply an indeterminate character. Therefore, we propose students to design an **“inhabitable cell”**: studying possible activities that could be carried out inside a minimal space, and at the same time, to think about the structural system chosen and the future construction of this prototype.

Each team of students –between 4 or 5 people- will design their prototype for a maximum area of 2.40 x 2.40 m. Students will start their designs following different basic schemes of deployable structures, given by the teachers, although during the process each team could propose and explore other alternatives and more complex designs.

Teams will consider in their projects different ways to optimize their designs, and the prototypes should be built attending to limited space and time.



## **Prototype**

The prototypes will be built on 1:1 scale and will attend to the physical and real characteristics of the project.

Each final design and prototype will be evaluated, therefore, according to the spatial quality, the capacity to be deployed and the optimal use of material resources.

## **Research**

Each team will design a summary document describing the proposal. It will be necessary to include a diagram with numerical values of the previous parameters.

## **Result**

At the end of the seminar the prototypes will be exhibited and they will be checked together. Therefore, a final publication (DINA5 format) will compile descriptions about the projects, graphic documents, parametric diagrams, pictures of the prototypes.



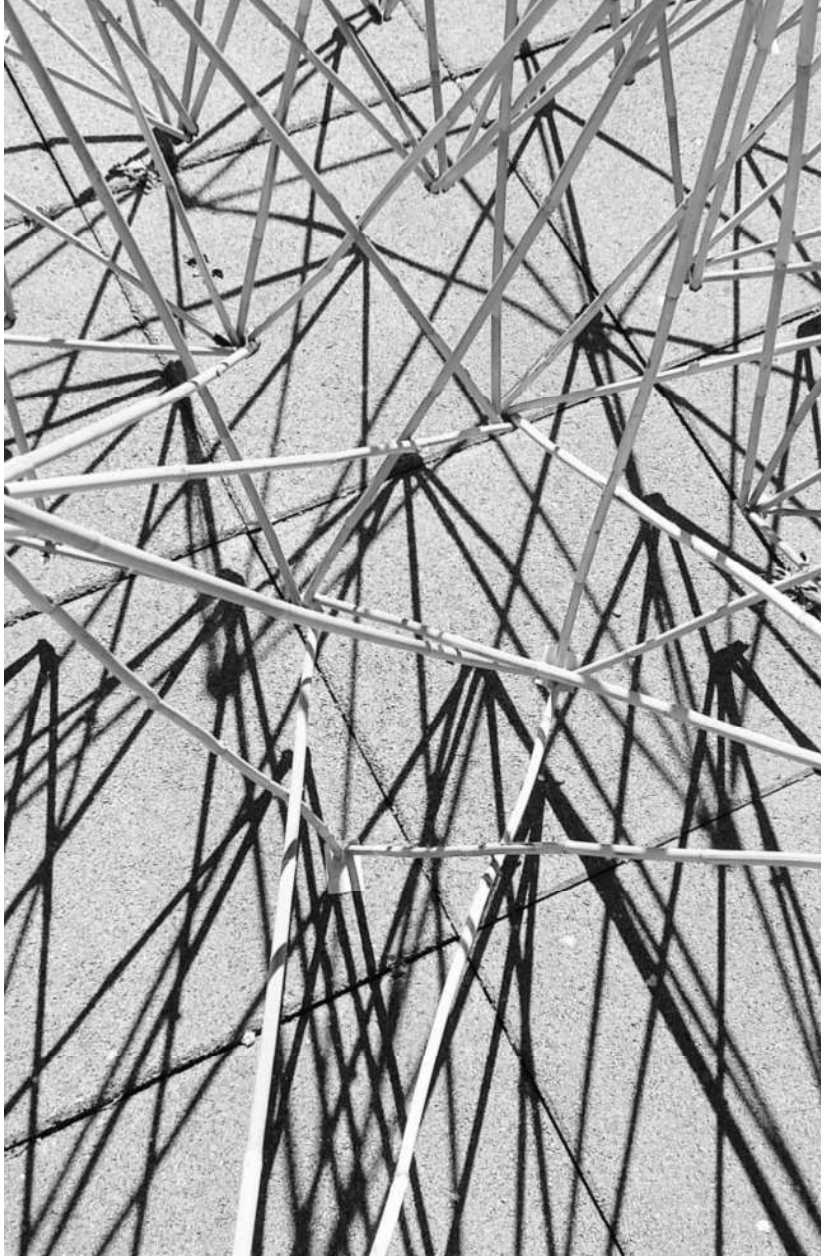


## **Final Criteria**

Prototype will be considering the following criteria:

- >>>> Best prototype built.
- >>>> Minimum weight.
- >>>> Maximum foldable index  
(unfold volume /fold volume).
- >>>> Minimum density.
- >>>> Minimum duration of the cutting process.
- >>>> Minimum duration of the assembly process.
- >>>> Minimum number of assemblies.
- >>>> Minimum number of joints.
- >>>> Minimum number of cardboard panels.
- >>>> Maximum use of the panels.
- >>>> Maximum use of the pattern.







# PROGRAMME

## Tuesday / 28.02.17

- 11:00-12:00** Presentation: Prof. Dr. I. Borrego.  
*Introduction to the academic team.*
- 12:00-13:00** Theory input 01: P. García Martínez.  
*Folding structures – Basic patents.*
- 13:00-14:00** Lunch time.
- 14:00-15:00** Theory input 01: P. García Martínez.  
*Research topic and goals.*
- 15:00-15:30** Organization of teams and research tasks.
- 15:30-18:00** Work in teams:  
First drafts, folding geometries.
- 18:00-19:00** First drafts presentations.





**Wednesday / 01.03.17**

**10:00-11:00** Theory input 02: M. Solano Rojo.

*Colonized Spaces.*

**11:00-13:00** Work in teams:

First sketch models.

**13:00-14:00** Lunch time.

**14:00-15:00** Laser cutter introduction.

**15:00-18:00** Work in teams:

Models and start fabrication.

**18:00-19:00** Models presentation.







**Thursday / 02.03.17**

**10:00-11:00** Theory input 03: M. Peña Fdez-Serrano.

*Utopic Megastructures.*

**11:00-13:00** Work in teams:

Fabrication and assembling.

**13:00-14:00** Lunch time.

**14:00-18:00** Work in teams:

Fabrication and assembling.

**18:00-19:00** Prototypes presentations.





**Friday / 03.03.17**

- 10:00-13:00** Work in teams:  
Fabrication and assembling.
- 13:00-14:00** Lunch time.
- 14:00-18:00** Work in teams:  
Fabrication and assembling.
- 18:00-19:00** Final presentation.
- 19:00-20:00** Evaluation, Awards ceremony and drinks.



## TEACHING TEAM

### **Prof. Dr. Ignacio Borrego**

Full Professor at Technische Universität Berlin, chair of Architekturdarstellung und Gestaltung, and director of CoLab/Berlin.

### **Martino Peña Fernández-Serrano**

Assistant professor at ETSAE. PhD Dissertation at the ETSAM. Final project at the TU Braunschweig. Guest researcher at the TU Berlin by Professor Mike Schlaich.

### **Pedro Garía Martínez**

Assistant professor at ETSAE. PhD Dissertation at the ETSAM. Guest researcher and teacher at ETSAM and at L'Ecole Nationale Supérieure d'Architecture de Paris la Villette.

### **Montserrat Solano Rojo**

Assistant professor at ETSAE. PhD Dissertation at the ETSAG and at Facoltà di Architettura Roma Tre. Guest researcher at Roma Tre, ENSA Toulouse and ENSA Paris Belleville.



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