

## NOMAD - Network of Optimization Modalities in Architectural Design

*Prof. M. Andersen, Dr. Boris Karamata  
Interdisciplinary Laboratory of Performance-Integrated Design (LIPID), ENAC, EPFL*

*Prof. E. Rey, Dan Bolomey, Loïc Fumeaux  
Laboratory of Architecture and Sustainable Technologies (LAST), ENAC, EPFL  
M Andersen: marilyne.andersen@epfl.ch*

### Abstract

Two pairs of identical experimentation modules are being developed within the framework of a collaborative initiative named NOMAD – Network of Optimization Modalities in Architectural Design - between the Interdisciplinary Laboratory of Performance-Integrated Design (LIPID) and the Laboratory of Architecture and Sustainable Technologies (LAST), both at EPFL.

NOMAD relates to a series of projects related to the optimization of the building envelope in a sustainability context. Based on comparative evaluations in two climates (cool-temperate versus hot-arid), these projects will most notably rely on a dual infrastructure: the NOMAD modules.

These modules will be located in Lausanne, Switzerland and in the Middle East (Ras-Al-Kaimah, United Arab Emirates (U.A.E.)). They are currently in design development and will be operational in the fall of 2012 for the launching of the Master in Energy Management and Sustainability Caravans. One pair of modules will be located on the main EPFL campus in Lausanne, Switzerland and the other pair will be installed on the site of the EPFL Middle East campus in Ras-Al-Kaimah, U.A.E. The modules' dimensions will be 3 m wide x 3 m high x 9 m deep so as to allow deep plan layouts, and include an active insulation skin for temperature and heat exchange control. Having the modules in pairs offers the option either rely on a reliable reference case in any measurement campaign, to hide the measurement setup from the users in field studies, or to conduct two experiments simultaneously to get most out of periods where optimal climate conditions are scarce. This dual climate approach allows us to open up an innovative and original research framework, able to generate new façade concepts with high environmental standards, and to develop bio-climatic strategies based on multiple criteria. This unique dual research facility will thus be particularly adapted to investigate climate-related issues in building technology and to enhance the educational potential in sustainable architecture at EPFL and EPFL Middle East.



**Figure 1 : NOMAD modules concept for Swiss and Middle East locations allowing flexibility in façade setup, space layout and climate conditions.**