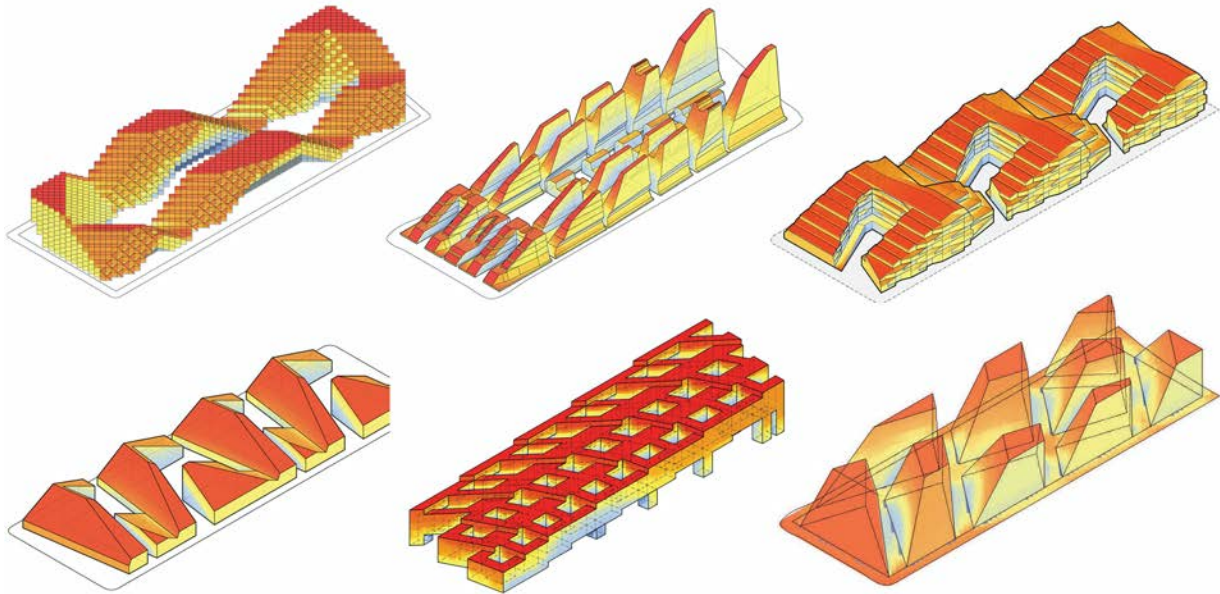


# SOLAR SCULPTING

## building form and energy

Politecnico di Milano - AUIC  
Master Program in Architecture  
Advanced Design Studio  
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### COURSE OVERVIEW

#### **Aim of the project**

The sun provides a vast majority of the energy available on the earth: coal, oil, natural gas, biomass, and even the wind and hydropower to generate electricity originally derive from sunlight. Human metabolism also runs on solar energy, although it cannot use it directly, relying instead on plants to convert solar radiation into chemical energy for food. Buildings, too, can directly harness the sun: passive solar design employs building's orientation, footprint and layout, materials and colours to achieve favourable conditions to humans without the use of machines.

**Solar Sculpting investigates the relationship between form and solar energy in buildings, using form-finding strategies based on solar radiation to shape a mid-rise housing building for New York City. Students will explore the potential for passive, adaptive and active solar design principles to achieve comparable results in terms of energy performance and visual comfort in buildings, based on optimised shape rather than on mechanical systems.**

Results from the optimisation of building form will provide the basis for the integration of cost-effective, low-maintenance façade energy systems for new multi-family housing. By integrating and extending current solar technologies, such as photovoltaics and solar thermal, for the predominantly vertical infrastructure of the city, the studio targets innovative building mass and surface strategies that are highly energy efficient, generate on-site renewable energy, and produce a new formal vocabulary for sustainable construction.

The Studio is part of an international research program between the Polytechnic in Milan and Pratt Institute in New York to share content and expertise.