

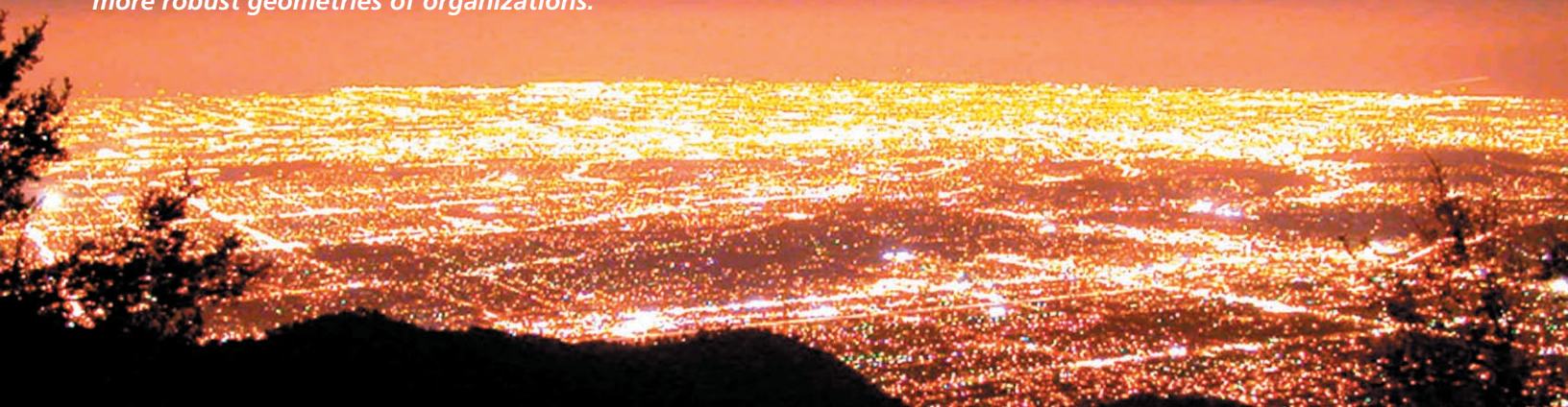
OFF the Grid

University of Pennsylvania, Dept. of Architecture, Fall 2005, Studio 601

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This studio will design housing prototypes relative to alternative infrastructures. With a specific focus on power grids and networks, we will examine the design implications of a shift towards emerging energy technologies and more robust geometries of organizations.



Site and Program

The site for the testing of design prototypes will be east of Phoenix in an area known as **Superstition Vistas**. This area spans 360 square miles and is currently the subject of great debate with regard to the future of urban sprawl in one of the fastest growing areas of the country. The subdivision model of housing which has been a model of urban growth in the second half of the twentieth century is endemic to this region, and is producing a vast horizontal expansion with questionable prospects for sustainability. The projects in this studio will address this phenomenon of urban sprawl by co-evolving alternative **subdivision geometries and associated housing prototypes**. This problem is more than a purely geometric one. Any alternative to our current models of efficient universal organization have to take into account problems of energy, material, and most importantly, societal values and aesthetics. However the studio will discover that issues of geometry, matter, and meaning are surprisingly intertwined.

One of the most important factors in sprawl is the pervasive cultural desire in the United States for **autonomy** and independence. Therefore, no speculation about the future of our infrastructure can take place without taking into account our desires and needs for living, and this is why infrastructure and housing are tethered problems. The ability of design intelligence to formulate and re-formulate the possibilities for how we desire to live is where architecture can make a difference.

The studio will take into account recent research into the possibilities of **digital fabrication** and the ideas of **mass-customization**. But rather than accept the consumerism latent in this idea, we will ask how the economic conditions driving the trend is already an ecological phenomenon. The coordinated visual studies section will provide workshops into **scripting and coding** to provide skills relative to the veiled implications of generation and collaboration in this emergent practice.

The Energy Grid

The Californian energy crisis of 2000-01 and the great blackout of summer 2003 is clear evidence that our energy infrastructure not only needs to reconsider its heavy dependence on fossil fuels but its primitive organizational structures. This studio will study the current state of affairs and focus design propositions on the development of new housing prototypes that might point to new models of energy generation, distribution, and consumption.

Any electricity put back into the grid results in the strange sight of an electric meter running backwards. This is the interesting possibility of a localized energy infrastructure owned and managed by the subdivision zone itself. By supplementing traditional fossil fuel generators with alternative resources (solar, wind, bio-diesel), projects will examine the implications of **micro-infrastructures** that go off the universal energy grid and establishes a two-way exchange of energy. This immediately raises problems of architectural integration with technology, and expressions of collectivity and individuality.

The Forest is a Computer

The problems of energy, habitation, and the future of the built environment necessitates rethinking the conceptual divisions between the technological and the organic regimes. This studio will investigate current thought in ecology that moves towards a blurring of artificial/natural distinctions.

The ecologist Daniel Botkin points out that nature has historically been understood through two great metaphors. Nature as a fellow creature, alive and intelligent (mother nature), which was supplanted in the late seventeenth and eighteenth century with the metaphor of nature as a great, calibrated mechanism. Botkin calls attention to the fact that much of our assumed attitudes towards natural reserves and the idea of a precarious ecological equilibrium are extensions of this mechanistic metaphor. As Botkin provocatively points out, we are witnessing the emergence of a new metaphor: nature as a computer. This metaphor elucidates possibilities for a deep collaboration with the processes of the material world at the computational level as we begin to understand the inner workings of what had been inaccessible, sublime powers. "Nature in the twenty-first century will be a nature that we make, the question is the degree to which this molding will be intentional or unintentional, desirable or undesirable."