Work (Architecture)

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Abstract

WORK is an annual publication of the Department of Architecture that documents student work in design studios and courses in the Master of Architecture and Post-Professional programs, as well as events, faculty news and student awards. It also includes abstracts of PhD dissertations defended that year. It provides an opportunity to explore the creative work of our students and is a permanent record of work in the Department.

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WORK 2005/2006

UNIVERSITY OF PENNSYLVANIA
SCHOOL OF DESIGN
DEPARTMENT OF ARCHITECTURE

Detlef Mertins, Department Chair
William Braham, Associate Department Chair

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Clara Klein: ARCH 746 with David Ruy: Generative Models.

INTRODUCTION: RESEARCH, EXPERIMENTATION, INNOVATION

In a world that changes as quickly and unpredictably as ours today, one of the most important things for students to learn is, in fact, how to learn and how to keep on learning: how to incorporate critical perspectives and research as formative activities, how to use each new opportunity to gain knowledge and build new skills, and how to develop dexterity in order to respond effectively to new situations and challenges. As architects, we seek to help clients and society to conceptualize and materialize potentials latent in the evolution of human culture. The social, environmental, and urban challenges of our time make experimentation and innovation no longer the exception to the rule, but the rule itself—integral to the vitality and value of the profession.

At PennDesign, we pursue experimentation and innovation in all aspects of design, media and construction, taking advantage of new developments in technology as well as new models in science to envision environments that enhance lives in diverse settings around the world. Our graduate programs provide a robust academic infrastructure for students to acquire the diverse set of skills and knowledge needed for creative practice today, as well as a critical orientation to contemporary societal issues. Our design studios foster abilities to conceptualize and realize new cultural formations that cut across the old division between the social and natural, local and global, as well as traditional definitions of disciplines. At the same time, we continue to value the old and remain atuned to continuities across time and generations, be they productive or destructive. We encourage interdisciplinary studies and offer dual degrees with Landscape Architecture, City and Regional Planning, Historic Preservation and Business Management, as well as Certificates in Ecological Design and Real Estate.

This past year, we launched two new research units: the Non-Linear Systems Organization (N$_L$SO), directed by renowned structural engineer Cecil Balmond of Arup, to explore how architecture can learn from mathematics and the sciences—non-linear, algorithmic and complex—in the design of material structures across an open-ended range of scales, programs, and materials. We also launched the Penn/Tsinghua T. C. Chan Center for Building Simulation and Energy Studies, co-directed by leading researchers Ali Malkawi and Yi Jiang. The Chan Center aims to become an locus for innovation in building technology that advances sustainable design in China, the U.S. and around the world. For more information on these two initiatives see www.nso.penndesign.net and www.design.upenn.edu/bses.

Experimentation and innovation are increasingly permeating our core curriculum as well, as design studios and courses adapt every year in tandem with advances in the field. This year, Helene Furjan joined our faculty and reoriented history and theory courses toward contemporary research cultures, issues and techniques. Having redefined our first design studio last year to focus on generative models for making form and space, our second studio this year merged those skills with analyses of urban dynamics to propose strategic interventions into the urban fabric and public life of a community in Philadelphia. This was the fifth year of our Research Studios during the final semester, with subjects ranging from Ali Rahim's immersion in loops of emergent behavior to Cecil Balmond's extension of algorithmic design methods to campus planning; Winka Dubbeldam's work within the networks and meshworks of urban life and economies; Homa Farjadi's alchemical mixture of Wright's Usonia houses, Inaki Abalos's conception of "good life" and obsolescent suburban shopping malls; Steven Kieran and James Timberlake's explorations of off-site manufacturing techniques for loft housing; François Roche's design of conceptual-material robots to build structures of indeterminate complexity; and David Adjaye's spatializing of latent hybrid institutions within the neighborhoods of Philadelphia. I would like to thank François and David for being visiting professors, and for David agreeing to be the first incumbent of our new endowed chair, the Louis I. Kahn Professor of Architecture.

I would also like to thank all the faculty, students and staff in the Department for their extraordinary dedication and pushing the envelope of design.

Detlef Mertins, Chair
August 2006

Andrew Lucia

ARCH 501
DESIGN STUDIO I / ARCHITECTURE AND COMPLEXITY / RHETT RUSSO, COORDINATOR
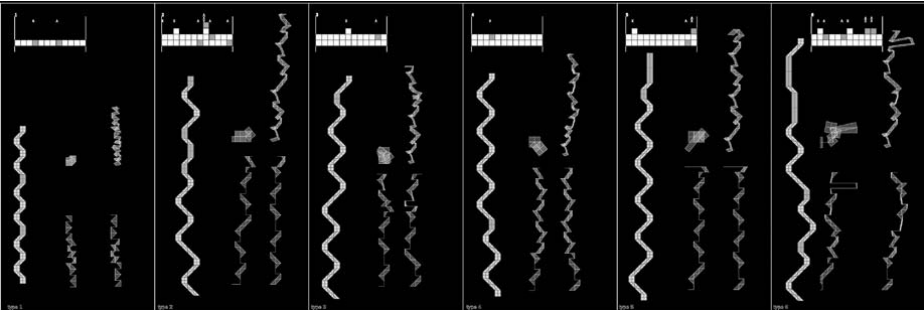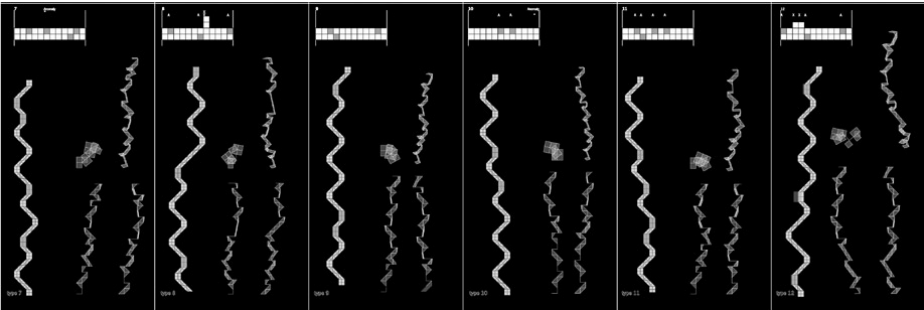
Measurement has always been fundamental to architecture and yet with its long history the use of mathematical methods has remained rather simple. What are the opportunities of approaching design as a process of studying the mathematical relationships between things, rather than the pursuit of a single form? How do we define useful parameters in the design process, and how can design benefit from the deployment of variables and attributes verse those prescribed by function alone? How might a systems based approach initiate a better understanding of complex behaviors and allow for a higher degree of spatial and formal variation? In addition to these questions this studio introduces fundamental processes of design, computation and fabrication.

The studio focused on issues surrounding complexity and the concept of systems. The applications of systems theory is trans-disciplinary, with critical discourses being developed in biology, economics, sociology, mathematics, computing, and cybernetics. Complexity theory is a critical response to questions concerning ontology, which has traditionally relied on causal explanations and linear thinking as a way of defining phenomena in the sciences. The students were asked to formulate a different approach; one that sought to isolate phenomena into levels of interrelatedness by defining what is irreducible for any given level. Scripting, manual drawing and digital modeling were all vital parts for formulating and executing these inquiries.

The semester consisted of three projects. The first project, Parametrics and Pathology, began as an analysis of pathologies that systematically alter the proportion and morphology of the human body. Techniques were developed for cataloging various types of deformation in the form of graphic analysis, mathematical expressions, and the development of parameter based assemblies. The second project continued with this research toward the design of The Institute for Genetic Drift. The mission of the IGD is to preserve the genetic material of animals; a genetic archive that would sustain diversity, so that genes could be reintroduced back into the gene pool at a later date. Located in downtown Philadelphia, this facility was developed within an urban setting as an annex to the College of Physicians. The final project, The Mauna Kea International Center and Observatory (MKIC) explored the history of geometric methods developed for celestial observation and navigation. Located on a now dormant volcano in Hawaii, proposals negotiated the interior demands of housing the telescope, the complexity of an operable and dynamic envelope, and the integration of the building into the steep terrain.

ANDREW RUGGLES: Fibrodysplasia is a slow transformation of soft tissue in the human body into hard bone. The body is deformed as new internal connections are born. Applied to the basic geometry of the Jenga block these deformations incrementally produced series of transforming assemblies. Entangled forms that emerged contained traces of several deformations derivative of the original, but hard to discern as the original rectangular shape. Once in three dimensions the incremental changes gave birth to a bottom-up born sequence carrying all of the deviations. Connected by the paths of incremental change each segment, seemingly indiscernible from its neighbor, amounted to a collective rich geometry.
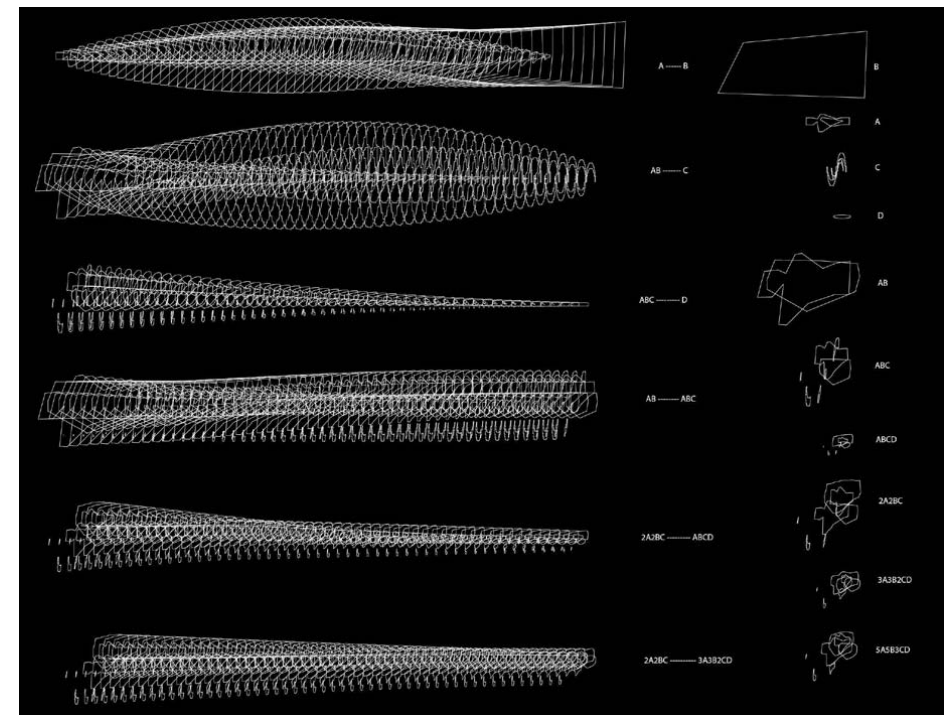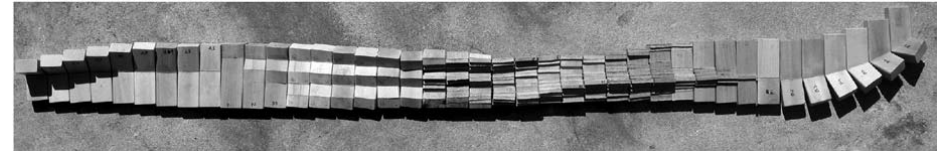
THE INSTITUTE FOR GENETIC DRIFT

KIM COOPER: A parametric design project based on the study the pathology of fibrodysplasia focusing on the porosity and degrees of freedom disclosed in its patterns of growth. This investigation resulted in the production of a series of variations which were studied, diagramed and deployed architecturally.
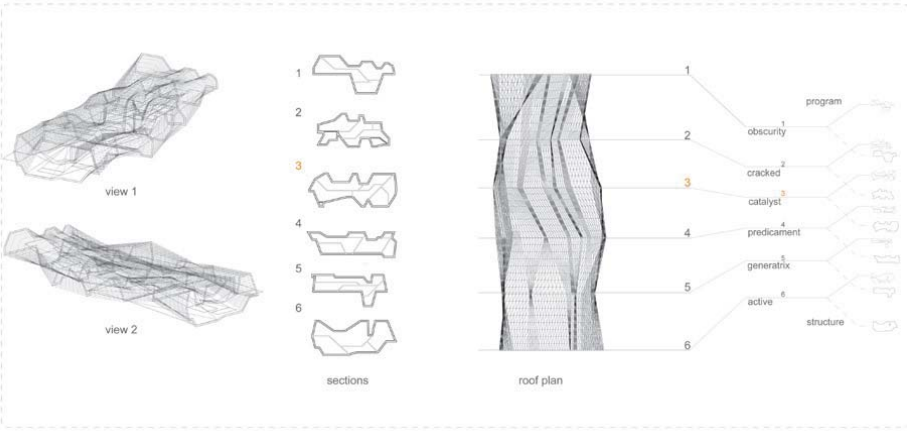
THE INSTITUTE FOR GENETIC DRIFT

KAY FAN: Parametric design methodologies were employed to design the institute. An extreme skin condition is developed into a mesh while actions are applied with a series of parameters when overlaying and intersecting the two layers systematically. Morphology of the layers informs each other to achieve complex mutation and facilitate creation of alien form. Intricate spatial experiences are delivered while walking through and on the archive and the building.

THE PLAYGROUND

view 1

view 2

sections

roof plan

program
obscurity
cracked
catalyst
predicament
generatrix
active
structure
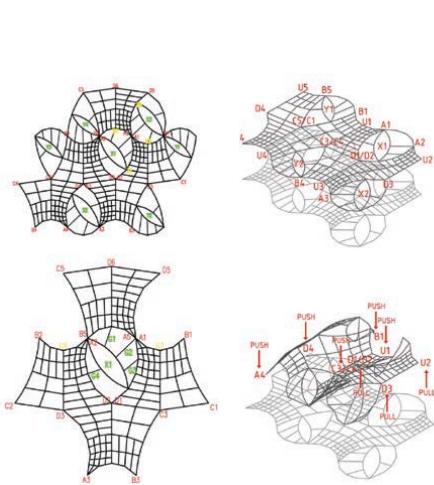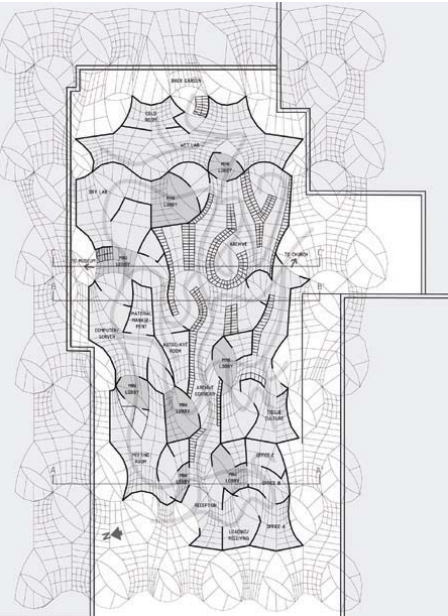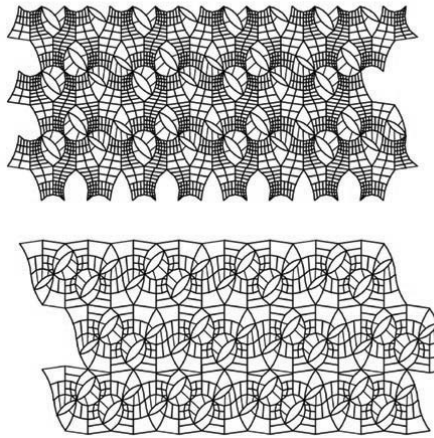
MAUNA KEA INTERNATIONAL CENTER AND OBSERVATORY

LATOYA NELSON: The origin of the project was a spiral cycloid study. A cycloid script was provided and altered to embody architectural principals of volume, growth, and interconnection. From the initial architectural principles, I established a set of rules to imbue architectural ideas regarding site, enclosure, and circulation. I also incorporated the site condition of the wind as a design parameter. My goal was to create a self-generating system that utilized the site condition of the wind. Within the initial diagram, at points of "interference," the system established a rule of "enclosure." This "interference" was a metaphor for the "wind." At the point of "interference" the system re-generates and also creates a "sub-system" of re-growth at a smaller scale. The initial diagram had a system in place that allowed for infinite growth.

The rules and diagrams translated into architectures in the form of a vehicular bridge, pedestrian bridge, vertical transportation (human scale and vehicular scale), distinct enclosure points, site parking, and terraces. Because of the irregularity of the site, a bridge was proposed to transport the Sub-Millimeter Array (SMA) to the assembly site, and the building was divided into a main lobby area as well as a public and private zone. These areas were interconnected by bridges, terraces, and elevators. The private area was designated for SMA assembly, and the public area was the exhibition space. On the site, there was a point of interference with the landscape and at this point the system re-generated based on the initial rules and parameters.
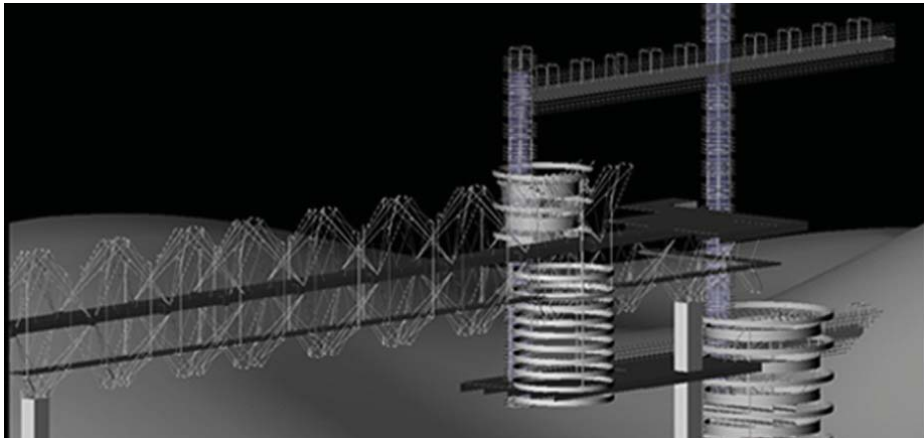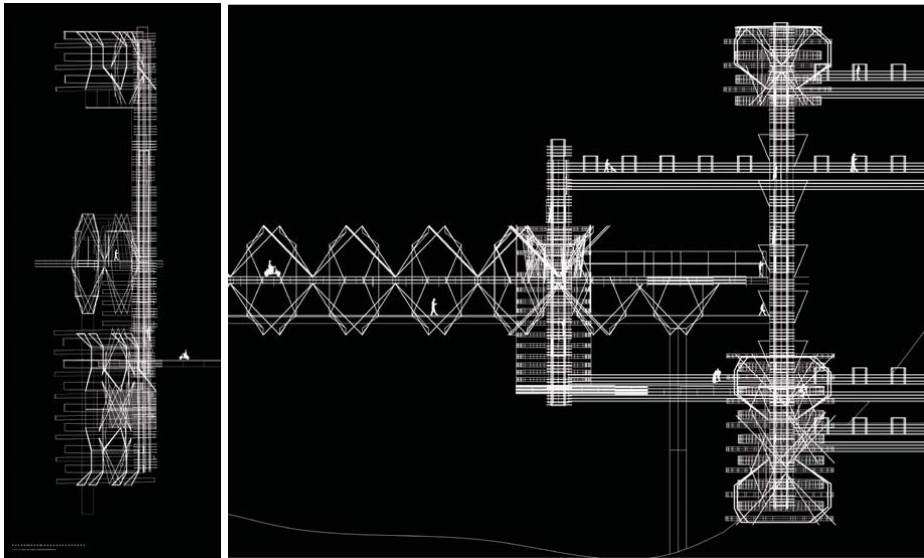
ANDREW LUCIA: This process explored the possibility of generating a material entity from the realm of the intangible. Having been spawned from a set of probabilities dealing with the concept of a formal physical materialization of the random, the challenge from the outset was to define a governing set of principles that would allow an extraction from one state, the intangible, to another, the tangible. A careful attempt to record the trace of the translation process was critical to the final reading of the built form. This ultimately led to a structure imprinted with the history of its realization.
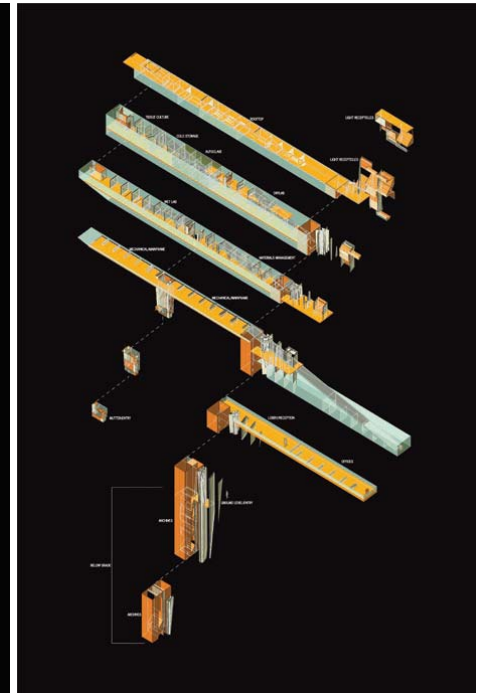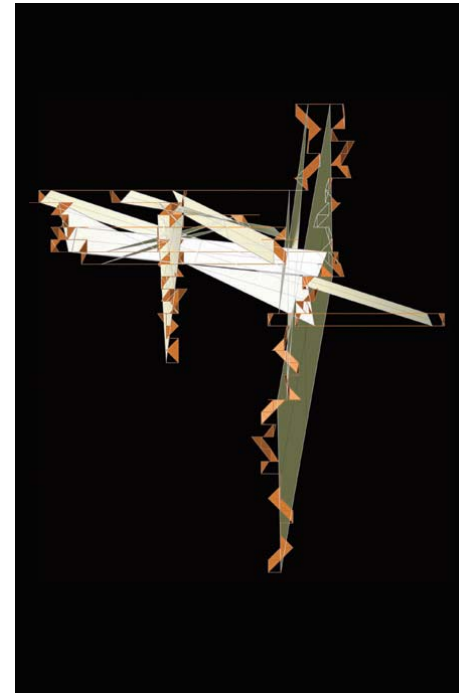
MAUNA KEA INTERNATIONAL CENTER AND OBSERVATORY
RYAN KEERNS: **In-between-ness. Building to site. Occupant to building.**
The building acts as a new landscape that facilitates movement throughout the site, creating an urbanistic relationship from a local density of observatories. The occupant moves through, between and across layers, resulting in contingent relationships to spatial conditions.

ARCH 502
DESIGN STUDIO II / ARCHITECTURE OF THE CITY / ANNETTE FIERRO, COORDINATOR
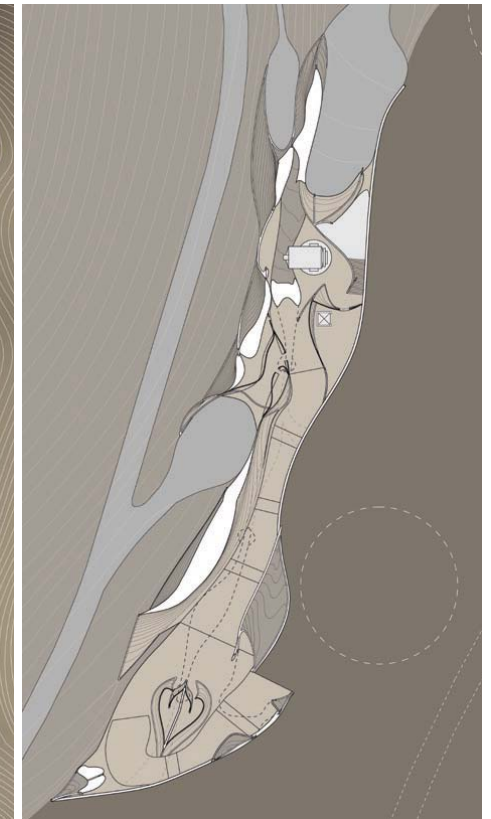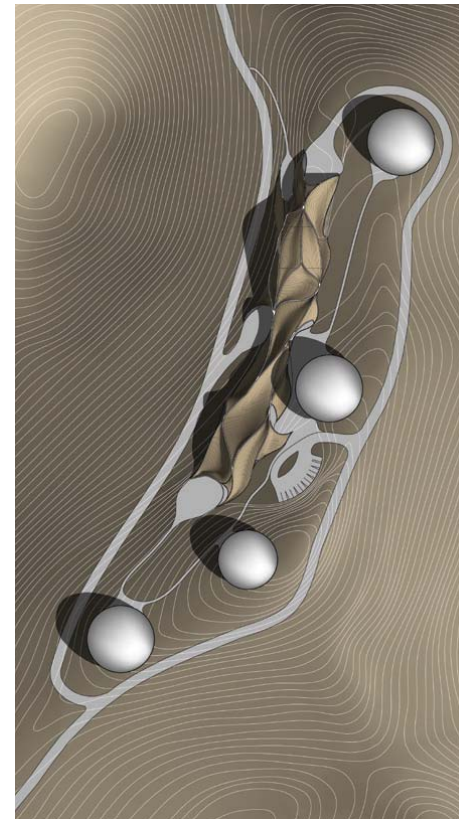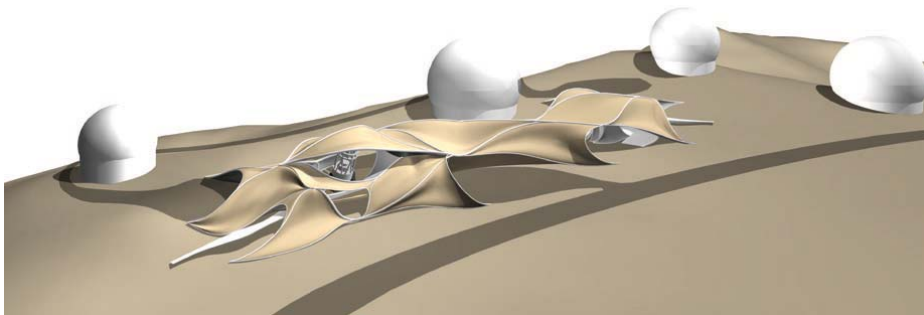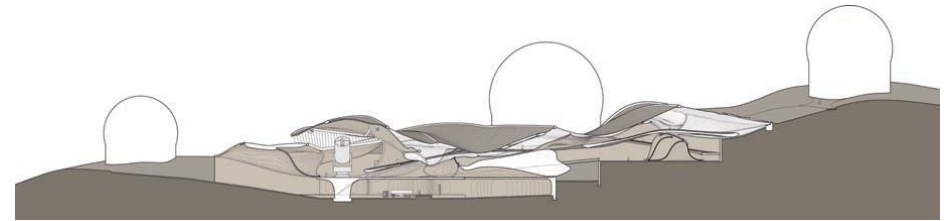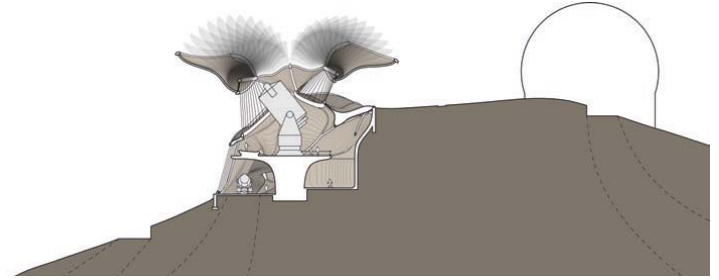
If the complex systems explored in Arch 501 depended on observations from extra-disciplinary origins taken into spatial and formal variations, the second semester studio attempted the generation of similar organizational complexities, but ones whose origins were found within the systems and networks of the city. Throughout the semester, experimental buildings were generated from a myriad of conditions, processes, and observations suggested by the urban domain--from different urban morphologies to the typology of specific buildings, from the static condition of existing built landscape to their dynamic attributes, from the proposition of a centralizing local social condenser subjected to the vacillations of regional movement and transport. Each instructor oriented their respective topic to address an urban issue and proposed a generative methodology parallel to the studio's content. Some of these methodologies deployed specific digital techniques and software; others did not.

The studio was organized in two parts, leading to one culminating semester project, a transport hub and supermarket. The first part took on different modes of urban analysis, conceived to address the long-standing question of the role of an analytical model in the active formulation of a generative modality. The second part of the semester resolved a piece of the large program to the scale of programmatic specificity, material and structural definition, and local systems of movement and infrastructure. For its focus, the studio examined a quickly transforming border between two neighborhoods in Philadelphia known as Northern Liberties and Fishtown. This area is characterized by a rapidly shifting population and economic base as forces of gentrification intervene into a previously depressed, post-industrial residential area. The site for the program was a large, abandoned landscape already aggressively crossed by networks of transportation, yet not actively connecting the two neighborhoods to the city-at-large. Fundamental to the contention of the studio was the concept that proposals would be conceived as dynamic entities, incorporated into and actively contributing to already changing structures of infrastructure, development tendencies and typologies of building form and program influenced by changing demographics.

CLAIRE FELLMAN: Located in a highly fragmented and rapidly gentrifying neighborhood, the project uses a weaving operation to remix and re-scale the urban fabric, juxtaposing new and old aspects of the site. Recognizing the value of vacant lots as enclaves of fertile disorder within the city grid, the project seeks to retain vacant pockets within the new structure.
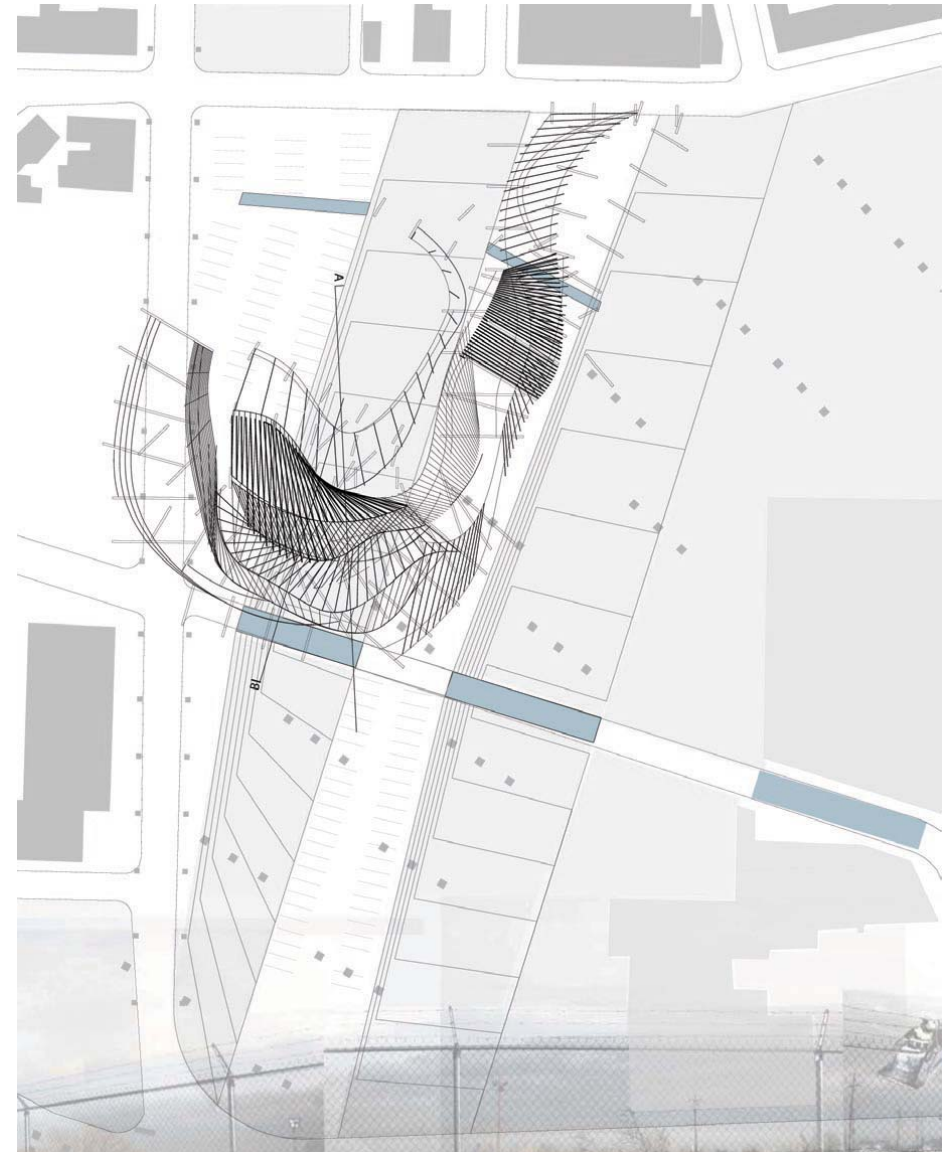
DANE DANIELSON: The overall design strategy of this project was to study the co-relationships between the building, site, and skin for a hybrid supermarket and transportation program through the conceptual study of interactive flow.

By overlapping dynamic areas of congestion, in addition to the gained site logic, a series of contours conceptualized the building form. These contours vertically slope and delineate as floor plates splines connecting the multiple programmatic control points into a continuous sense of fluid pedestrian flow.

The site mends the surface and building creating softscape forming pockets for transportation functions and doubling as the primary structural mechanism. Through the pixel vocabulary of elongation, ellipse, and circular with color and density reflect the cause and effect relationship between directing and being directed.
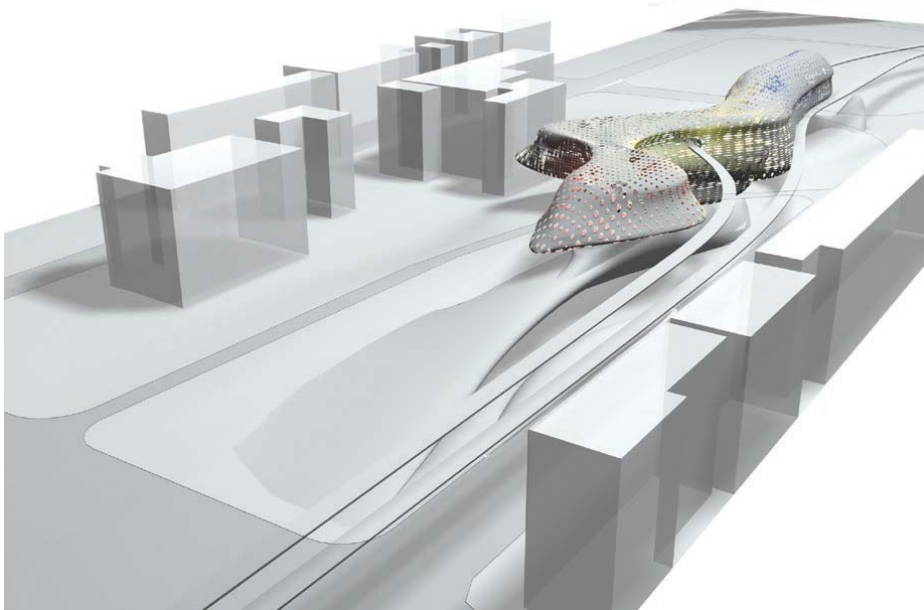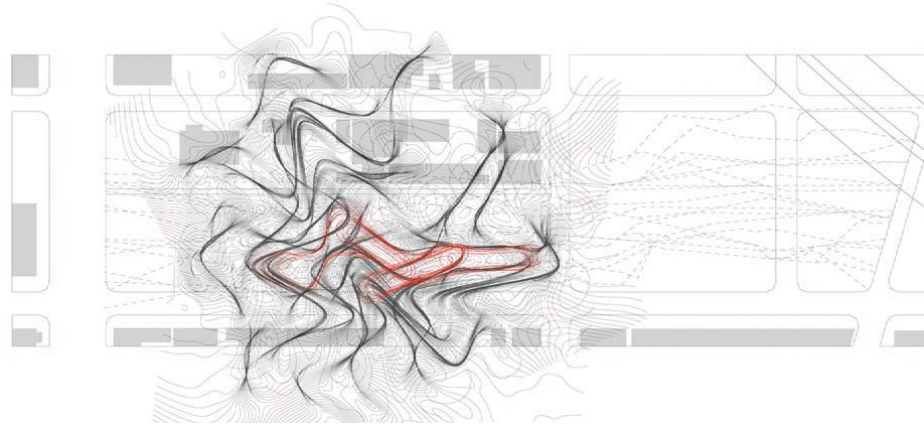
BEN MULLER: The transit hub designed for Fishtown, a section of the city of Philadelphia, takes on the Moebius as a primary form generator and delamination as a secondary and tertiary generator of space and structure. The hub separates flows on its many levels of delamination providing fluid connections and functionality for an elevated subway, 2 trolley lines, car traffic and 2 types of pedestrian traffic, both hurried and leisurely, simultaneously creating a park and a hub.
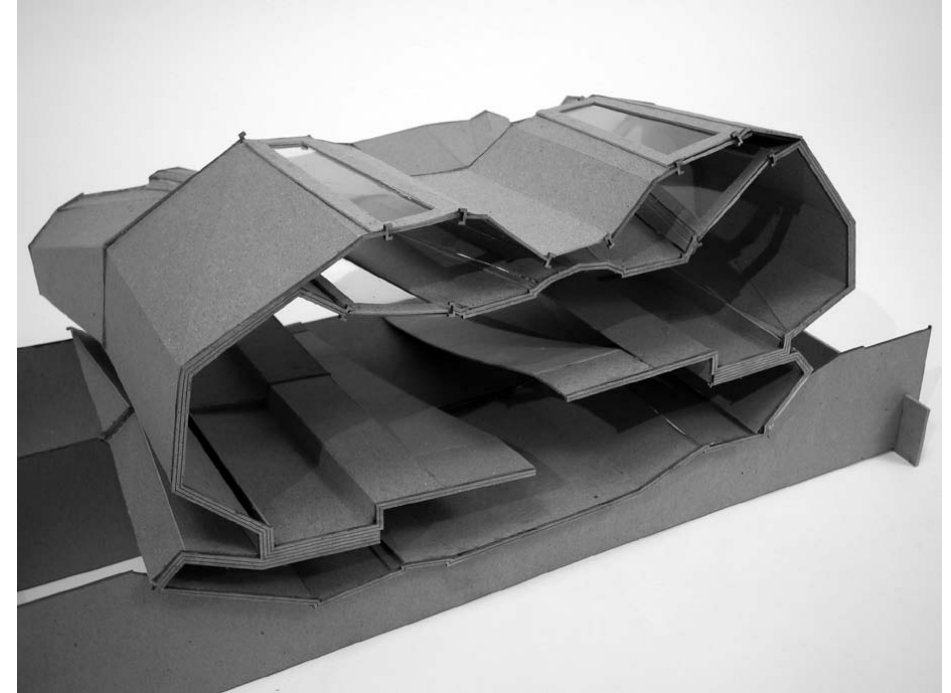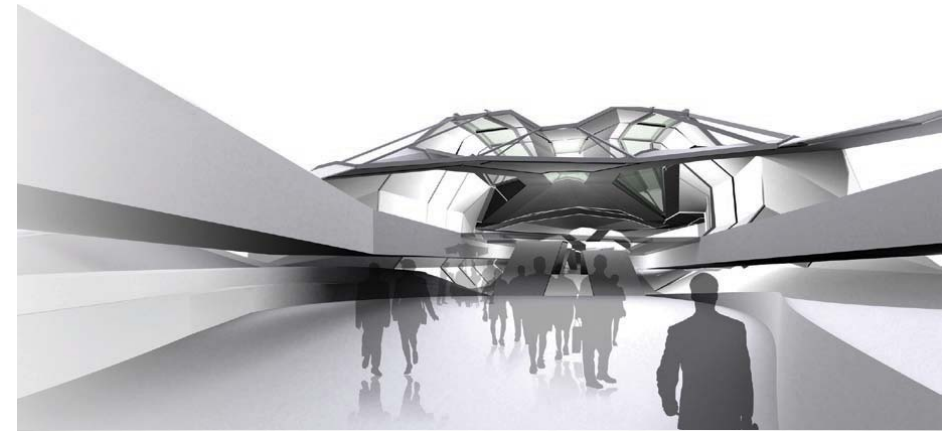
COMPONENT.SPINE

RYAN KEERNS: **The research began with a typological and morphological analysis of parking structures from which 'Interval Logics' were extracted to become the generative organising principles in both spatial and temporal dimensions resulting in a programmatic field distribution strategy.**

By further regulating multi-scalar sets of relationships through the use of parametric software (GC), a single component that embodied structure, aperture and enclosure was modulated to provide the building with surface and structural qualities capable of local adjustment and global consistency.
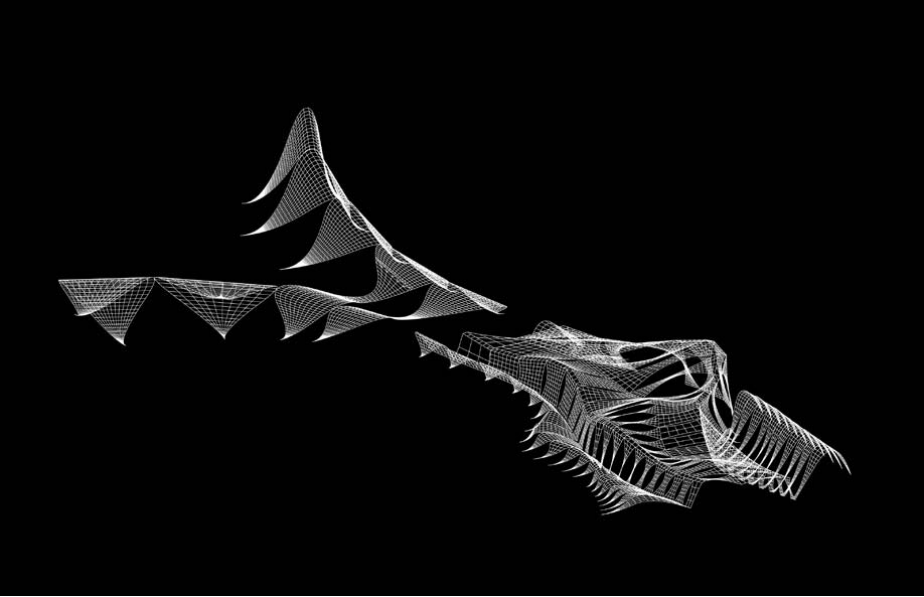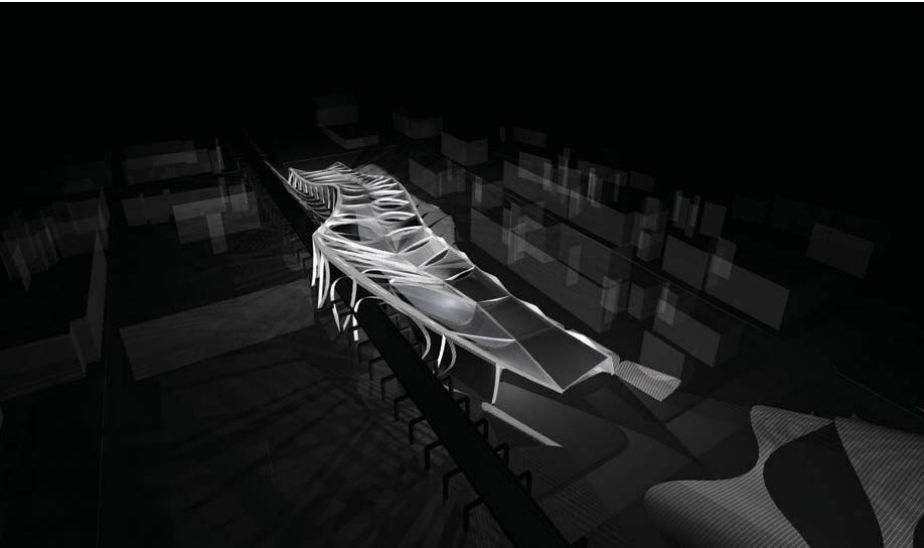
GABRIELA SARHOS: **This project, to develop a supermarket and transit hub, examined urban conditions in Fishtown and the shaping forces on the site: local/regional and manmade/natural infrastructures. Close observations of behavior and development were incorporated into wood cutting techniques allowing the studio to embed certain infrastructural and temporal efficiencies into form making. The form and program emerged from wood block cutting, unpacking and reassembly strategies, whereby supermarket shelving was interwoven throughout the transit hub program and also served as the main structural elements.**
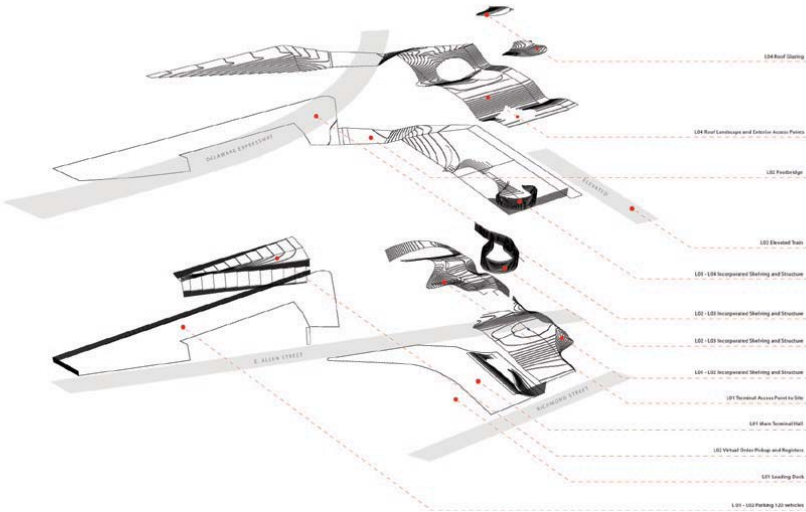
ABSTRACTING/EXTRACTING THE ARCHETYPE

ANDREW LUCIA: **The supermarket/transportation hub type was transposed by combining existing infrastructural requirements [transportation] with abstracted qualities [stretching] from the historic galleria type. A further level of transformation, to both the architectural type and the structure, was made by limiting the development of the new type to the operative aspects of a tensile structural system.**

ARCH 601
DESIGN STUDIO III / TECHNOLOGIES AND ECOLOGIES / WILLIAM BRAHAM, COORDINATOR
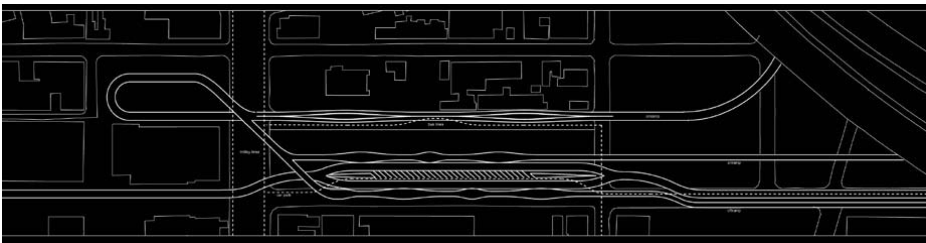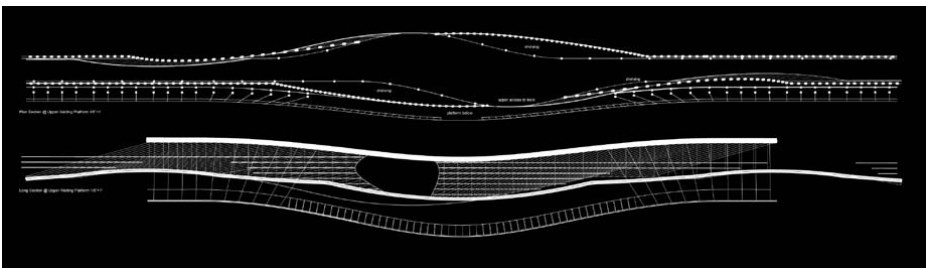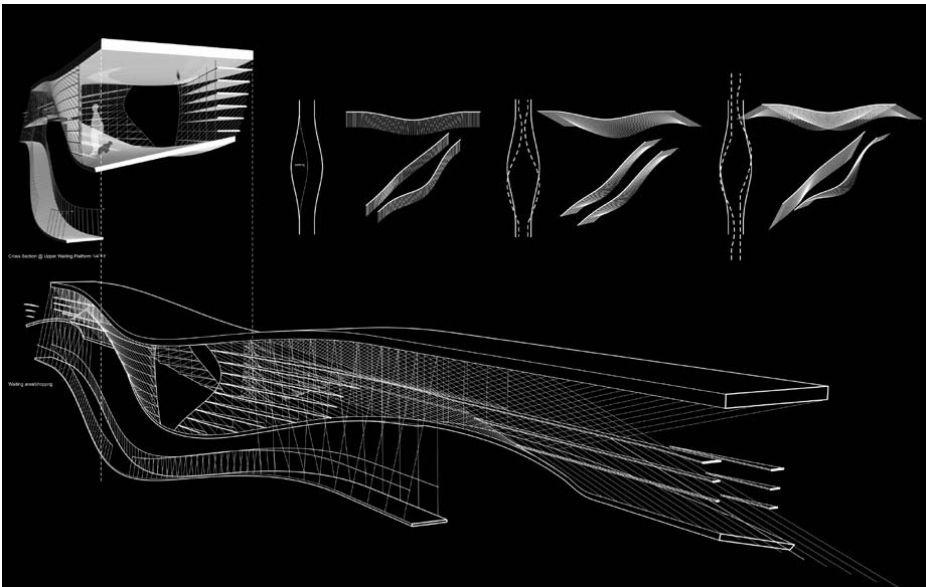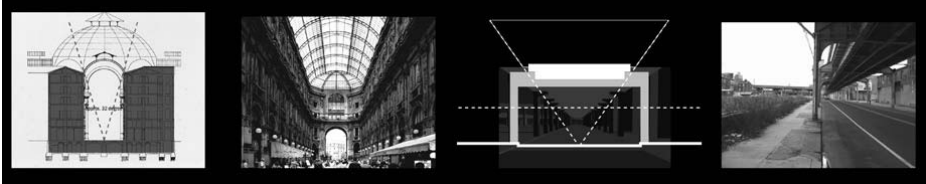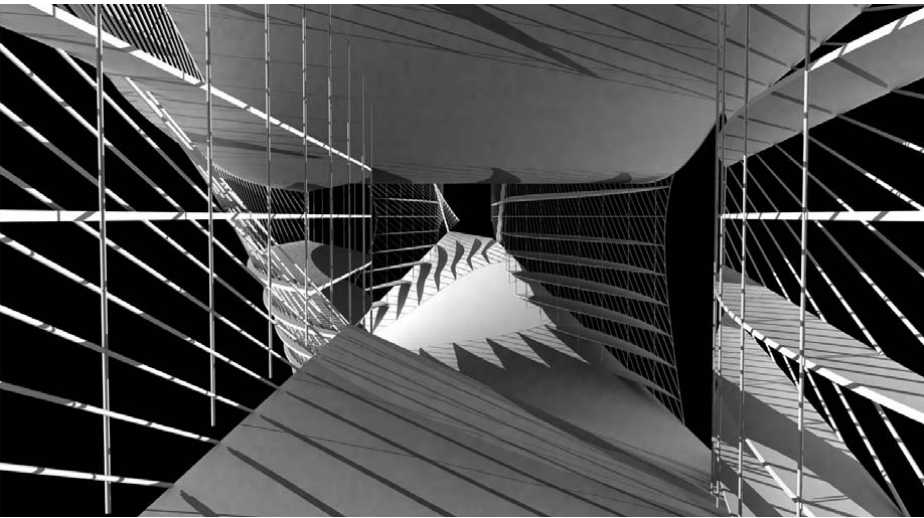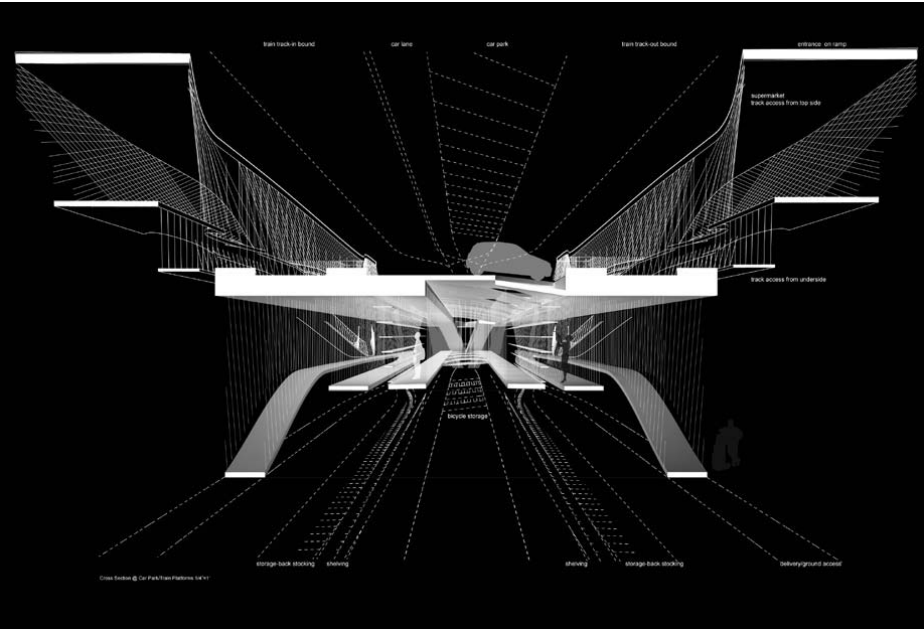
This is the first intermediate design studio and consists of six independent sections, each with its own orientation to issues of technology and ecology. Design projects involve complex public or institutional buildings, and require the detailed resolution of one ecological and technological dimension. Ecologies are considered in their natural, social, and technological dimensions, and in various degrees of abstraction and realization. This includes affinities between modes of analyzing and operating within natural ecosystems and systemic models of analysis of organizations, economies, urbanisms and material cultures, alternative economies, and the cultural politics of environmentalism, as well as the study of energy and resource use, recycling, environmental quality, and biomimetics. The studio is taught in close collaboration with Visual Studies Workshop III, whose techniques and exercises are tailored to each studio section.

WILLIAM BRAHAM
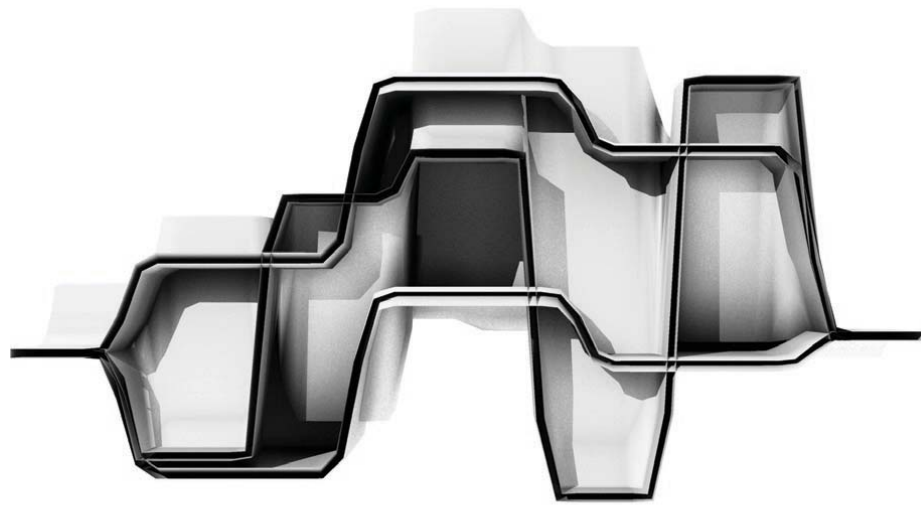
BIO-DYNAMIC DAYLIGHTING
Daylighting makes people healthier and more productive. This appears to involve both the amounts of light and their dynamically changeable qualities, qualities that are too often excluded by crude shading devices or reflective glass. This studio developed new techniques for designing responsive buildings that engage the biodynamics of daylight.

The project was a new school of material arts at 3200 Walnut Street, Philadelphia, which will offer courses of study in industrial design, including exhibitions and lectures for the general public. The school maintains a small, full-time faculty of about 12 and a larger associated faculty, whose expertise focuses on innovative material techniques and assemblies. Their work is primarily concentrated in open, high-ceilinged work spaces, though they maintain separate offices for research and writing. About half of those work spaces must be located on grade with sufficient access for a standard fork-lift. The client required that all rooms receive and respond to daylight, and that each room receive daylight from two different sides.

The shutter wall of Nouvel's *Institut de Monde Arabe* contracts and expands in response to light, just like the pupil of the eye. In the studio, we explored operative analogies between organic and mechanical systems, closely examining material structures and the dynamic responses of plants, animals, and eco-systems to light and dark, to the path of the sun, or the length of the day. The explorations provided new models for responsive daylighting assemblies. This studio was partly sponsored by Lutron Electronics, who design and manufacture daylighting control systems.

JONATHAN FOGELSON: This project takes advantage of layering to explore the modulation of both diffused and direct natural light. A multi layered building skin system has been devised, erasing the differences between "wall" and "window" by acting as both. Two layers of suspended UV resistant tensile fabric squares overlap within the skin, offering endless possibilities for light modulation and exposure control. The system is dynamic and operates with a series of cables to position the fabric. This motion of fabric and light in response to solar conditions is what I call the "Dance of the Hankies."
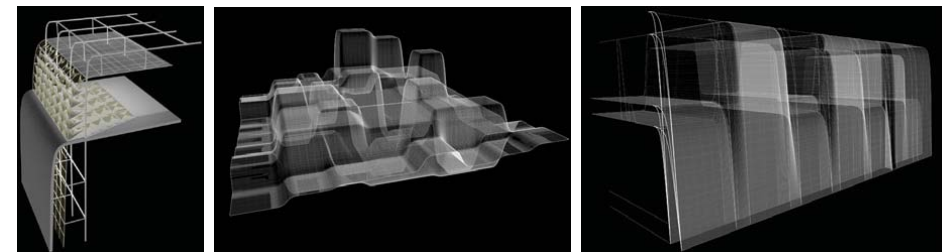
THE CENTER FOR DEEP ECOLOGY

The Center for Deep Ecology (CDE) is a coalition comprised of two disparate groups: the "Deep Ecologists" (DE), who seek to promulgate a bionomic understanding of people and the planet, and the "Natural Capitalists" (NC), who support the role of technology in solving earth's environmental challenges. Until now, each group has been a separate fledgling organization unable to gain traction: The DE lacks critical funding for their research while the well-funded NC lacks credibility within the scientific community. The symbiosis of the two groups is fragile and not always mutually beneficial. Funding for this think-tank will be provided largely by the NC and other similar groups.

The CDE plans to construct a new $35 million state of the art headquarters in Philadelphia that will embody the mission of the center. The new building project required that it not only incorporate the highest levels of sustainability, but that it must also teach a deeper understanding of ecology through its architectural form.

JEAN-PIERRE CASILLAS: While funding and driving the center, the Natural Capitalists utilize the Deep Ecologists as the façade for the center, revealing them as their public display. The outer skin remains continuously smooth while the inner skin is pushed inwards depending on programmatic needs. The space for the Deep Ecologists wraps around the entire volume providing a continuous façade to the center inhabiting the space between the two skins while creating a sideways interior atrium which houses the natural capitalists economically geared exhibitions.

PETER RAE: The Center for Deep Ecology is a low rise green roof structure intending to satisfy the needs and desires of two ideologically opposed ecological factions, the Natural Capitalists and the Deep Ecologists. The project takes advantage of its site in regard to its historical ties to the industrial revolution by proposing strands of green roofs that contain the campus program below and offer a community green space to the surrounding neighborhoods.
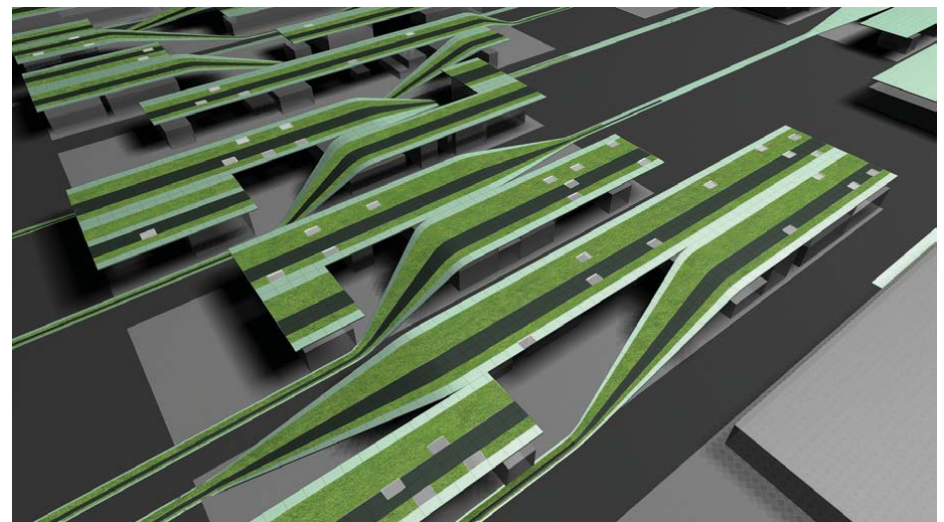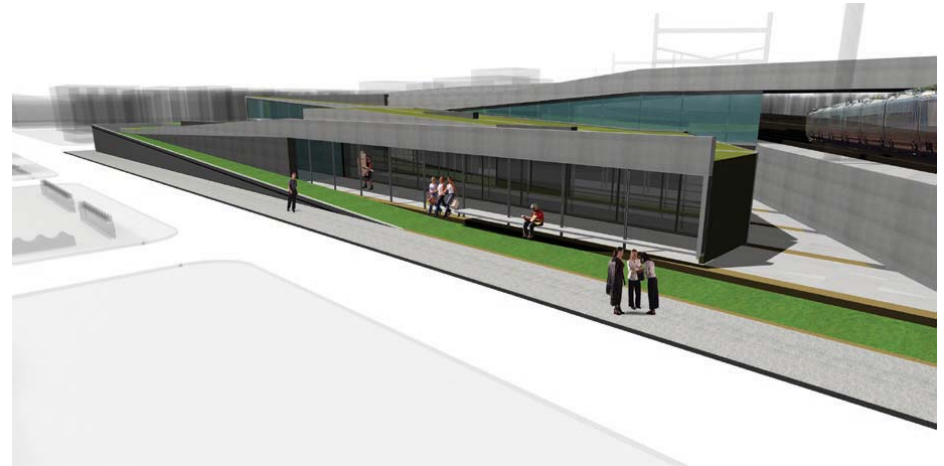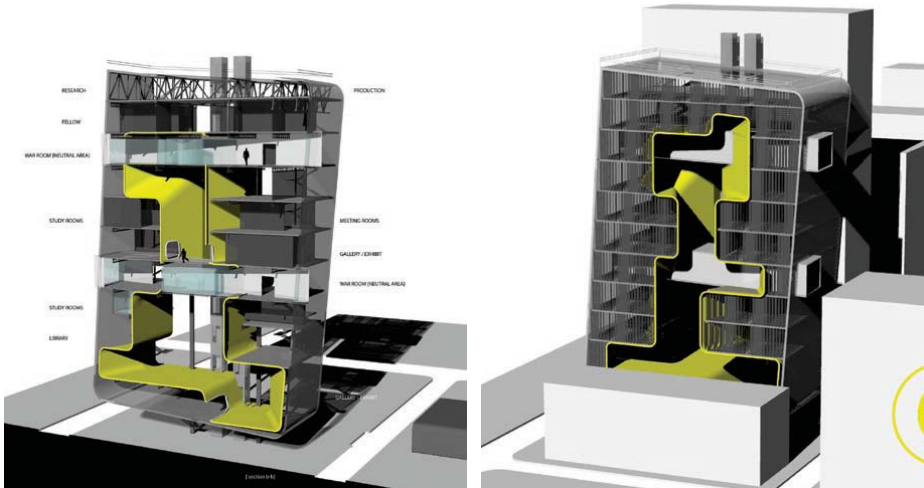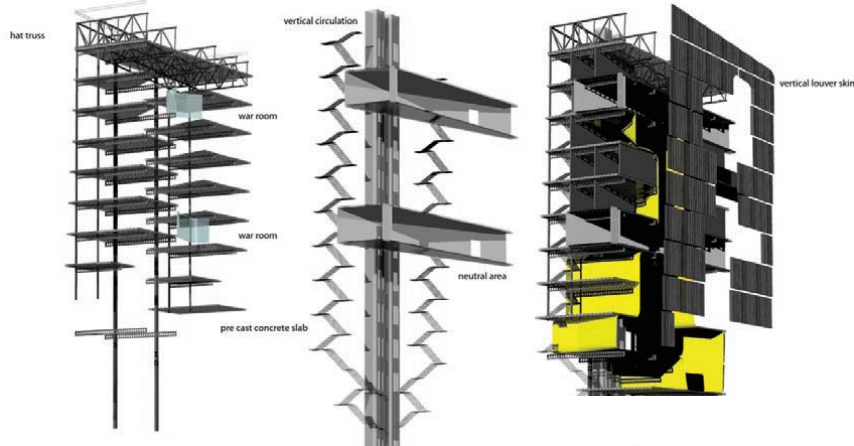
FORCE_FIELD_ECOLOGIES

The term "force field" is most often associated with science-fiction: supernatural barriers intended to protect humans from possible enemy attack or alien invasion. In an almost paranoid fashion, architects of the last half-century have constructed eerily similar architectural barricades: defensive, inert envelopes surrounding air-conditioned formless environments. In contrast, physicists studying gravity, electricity and magnetism, understand "force fields" in an entirely different way: as patterns of interacting force vectors (trajectories) mapping complex gradients and potential. While this understanding has palpable connections within advanced scientific disciplines, what are the implications for design? Rather than fortifying ourselves, is it possible for architecture to actively participate within (and with) these interacting "force-fields"? How can buildings intermesh with complex site ecologies latent with forces, fields of emergent phenomena, and flows of energy and information? If we advance architecture beyond its role as a passive static container, what modes of analysis, design and production must we employ (or invent) to begin an instrumental engagement with inherently dynamic phenomena?

The studio explored the idea of "force field ecologies" as instruments to explore new spatial, organizational and structural possibilities in architecture. Through the study of dynamical systems we considered the relationship between energy flows, structure and form generation. Using advanced computational technologies the studio sought to move design beyond metaphor. We pursued new kinds of architectures defined by their inherent capacities for change, including flexibility, adaptation, responsiveness and intelligence. Rather than resist complexity, we explored novel approaches to integrate dynamical logics into the design, production and occupation of buildings.

JUNGHOON KO: This project accommodates the new Franklin Institute for Experimental Sciences. I began the design using dynamic fluid simulation. The vortex was chosen as a catalytic model for the form, structure and energy system. Several geometric studies about the Salk Institute became the basis for propagating the new program.
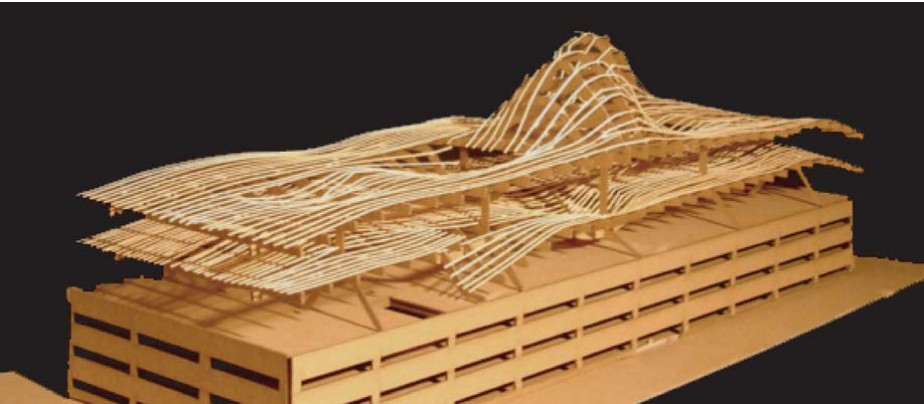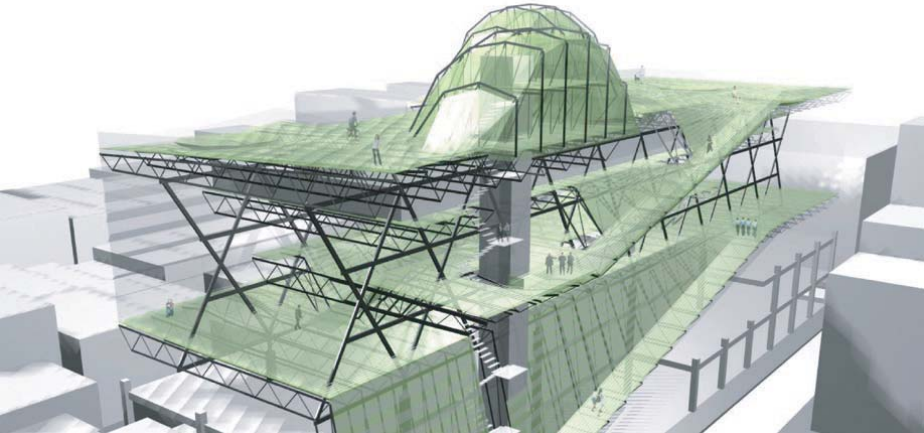
Inside Space Organization
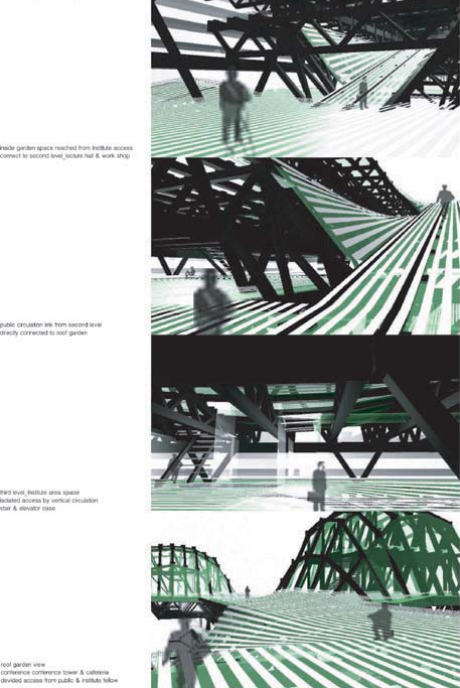
Structure & Skin Assembly
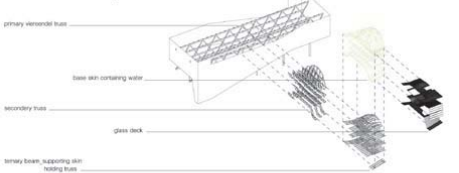
Circulation Assembly
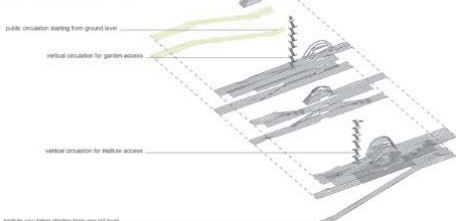
Energy Flow Assembly
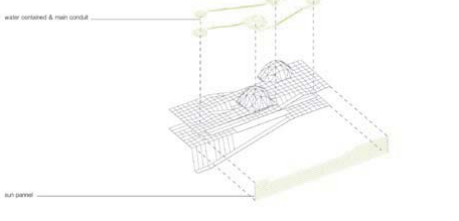
South Facade View
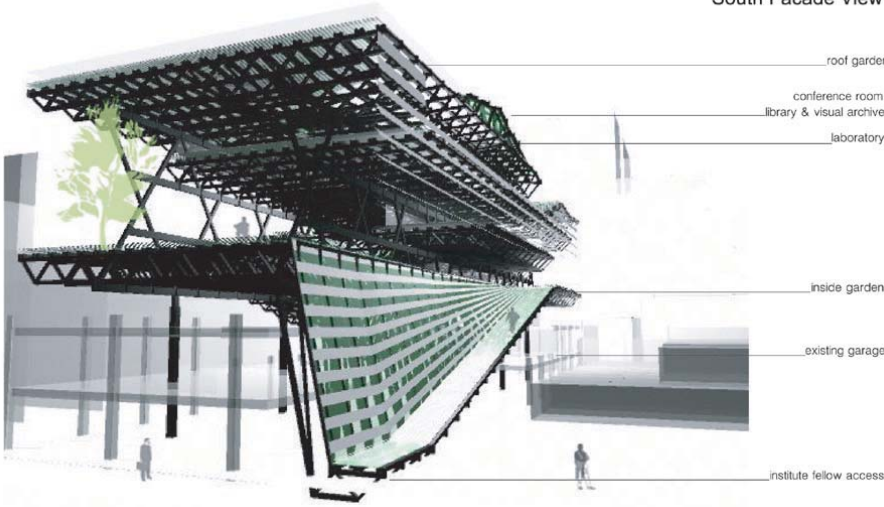
EVOLUTIONARY RECIPROCALITIES: THE CHIA-ROSCURA SCHOOL
This studio took as its program an elementary school with an explicit curricular agenda (developed in the UK) to integrate landscape as a primary method of promoting diverse learning activities outside the classroom. In this scenario, building and landscape become interactive, didactic elements in the pedagogy of the school. To this end, the characteristics of exterior were given exactly the same weight as those of interior, formed in a process of constant symbiosis. Equally, the constituent components of building were interchanged continuously with the constituent components of landscape and gardening.

In positing building as landscape and landscape as building, this studio examined the potential of incorporating actual biological material as literal components of building. The studio's methodology hinged on a metaphorical identification and investigation of an interactive, conductive interface which served as a basis for understanding the necessary transfer of air, light, water, and heat through and into surfaces. Geometries generated were confluent with the delivery and interchange of life-giving necessities, yet also constantly impinged upon by natural events and human activities. This method of generation was paralleled by an equally weighted technological investigation taking on the possibilities and necessities of particular plants or gardening processes, to be utilized in tandem with the demands of sustainable building. These were developed to a high degree of resolution early on, implicating detail as a primary impetus in developing building form.

JANG-HEE YOO: The material properties of dried seaweed and a giant gourd were developed into a mutable surface which is operated by the growing pattern of gourds and multiple louvers reacting to it. This mutable system on top of the school building provides dynamic porosity to the interior space below and also communal space above such as walking path and gardening area.
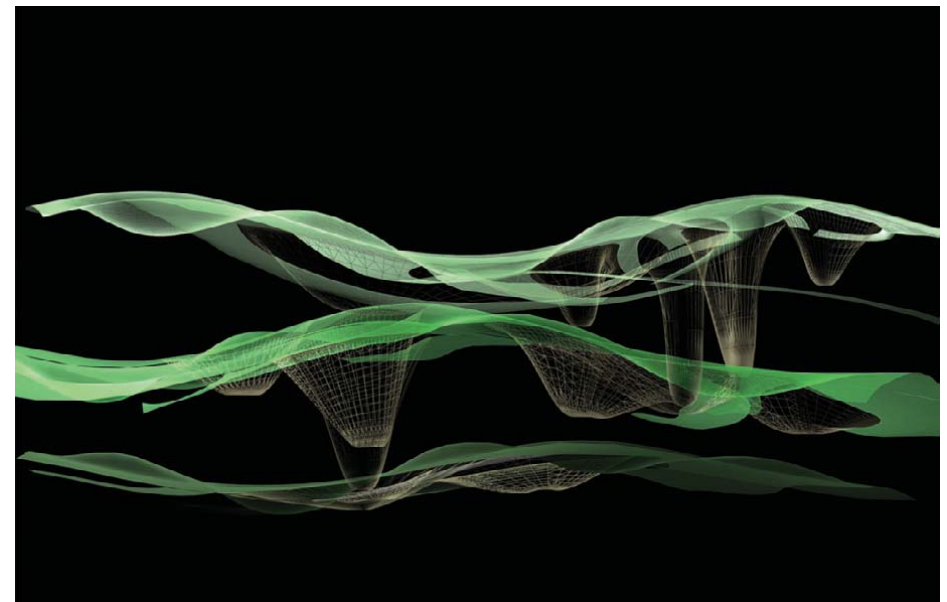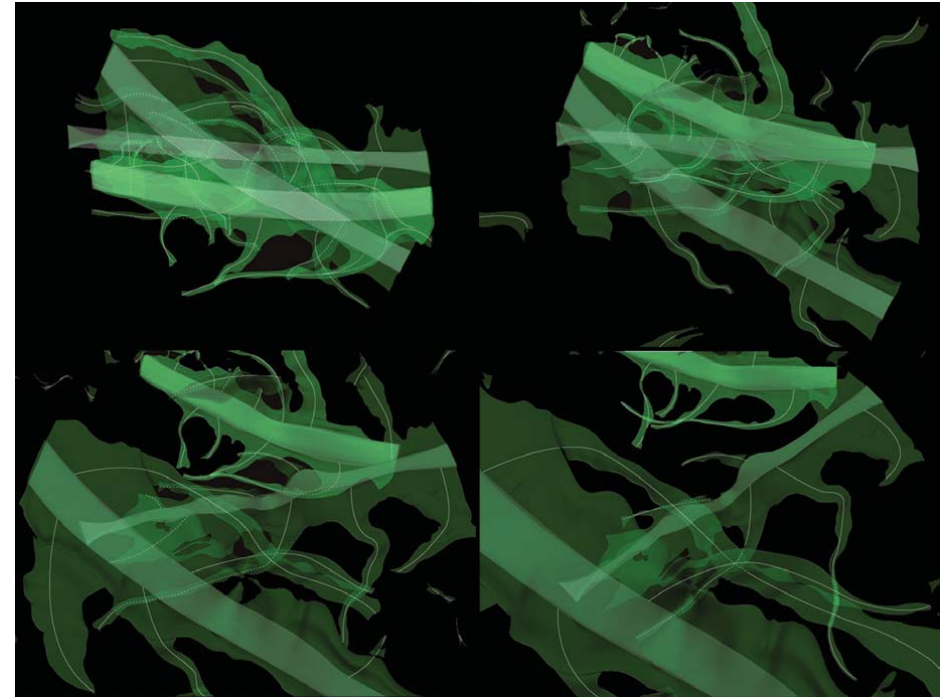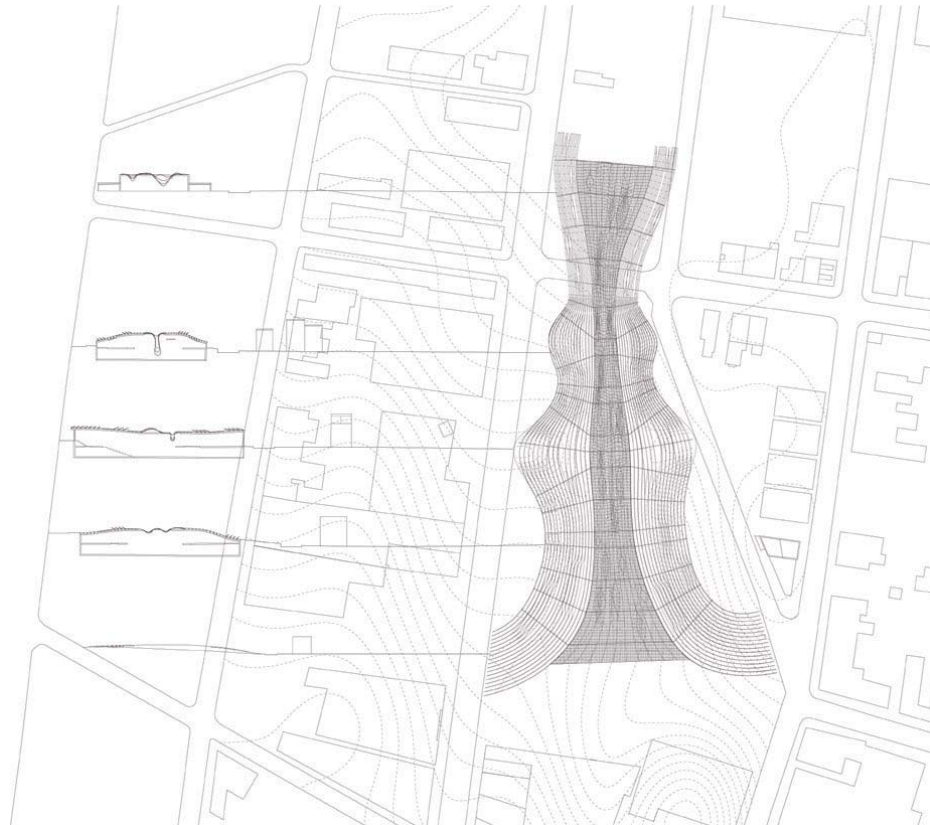
EXOTIC SKINS — SCARCITY VS. SURPLUS
The studio's interest in an economy of excess began with the writings of Georges Bataille, and his economic treatise: "The Accursed Share". In this text, Bataille foregoes the analysis of specific goods and services, markets and values, and presents a more general problem of energy flowing upon the surface of the earth, all of which gets traced back to the sun. Scarcity in Bataille's analysis is an artificial condition of specific economies. In the deeper structures of the material universe, there is only excess. Ultimately, just how this surplus is understood, and more importantly, expended, determines a specific economy's successes and failures.

Despite its important role in the history of industrialized economies, there are relatively few *factories* of distinction in architectural history. Typically designed as long-span structures with flexible open plans - mechanism and instrumentality inevitably push any architectural possibilities to the perimeter.

It is at the perimeter of things, however, where growth manifests, and our studio explored architectural potentialities at the extremities of the mass. We located and exploited the accumulation of excess energy on the surface of the factory as opportunities for alternate programs that are typically zoned away from factories. We accommodated the factory by providing extension through structural propositions and then concentrated design efforts on the outer surface of the factory as a thickened envelope.

STEPHANIE LEE: Located on New York City's East River in Brooklyn's DUMBO neighborhood, the project starts by developing incremental, cellular systems of growth as a starting point for devising skin systems. Modulation of the skins is composed of two structure systems: exterior primary skin of photovoltaic cell surfaces to generate productive electricity and a secondary skin of glass to regulate light. These skins can be opaque, translucent, transparent, or a combination of all three. In order to achieve maximum energy efficiency, the modulation surfaces are reconfigured according to solar angle and resulted in undulating hybrid skins along east and south wings. Groups of photovoltaic cells along these wings are developed by establishing a density of light modulators needed for interior programs, which can be used to operate motors and to power any number of electrical loads. The punctured areas that resulted from reconfiguration of modules are glazed and bring sufficient daylight to the interior working areas. The north and west skins, however, remain thin to allow maximum sunlight penetration into the building where offices and research labs are located.

OFF THE GRID

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

The site for the testing of design prototypes was 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 addressed this phenomenon of urban sprawl by co-evolving alternative subdivision geometries and associated housing prototypes.

This problem is more than a purely geometric one. Alternatives 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 discovered 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 took 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 asked how the economic conditions driving the trend is already an ecological phenomenon.

RYAN LOHBAUER: QUANTUM DOT HOUSE : Technology Facilitating Intricacy
Traditional solar technologies have necessarily treated sunlight as a scarce resource. But advances in quantum dot solar technology coupled with deployment in the Arizona Desert suggest a condition of solar energy in abundance.

Simultaneously, the nano scale and flexibility of this technology compliment the goal of developing alternatives to the traditional housing subdivisions. By thinking of the house as a field of experience, could an extremely fine grained and self-similar space produce a richer and more fertile living space?

A continuously variable space was proposed using layered translucent insulating panels with printed photo-voltaics. Articulated through scripting and repetition, this space provides all scales of living, from large public spaces, to rooms and closets, to extremely fine grains that would perform as ornament

Interestingly, the operation of the subdivision as a clean power plant suggests unusual political and financial structures that would also spur new concepts of residential living.
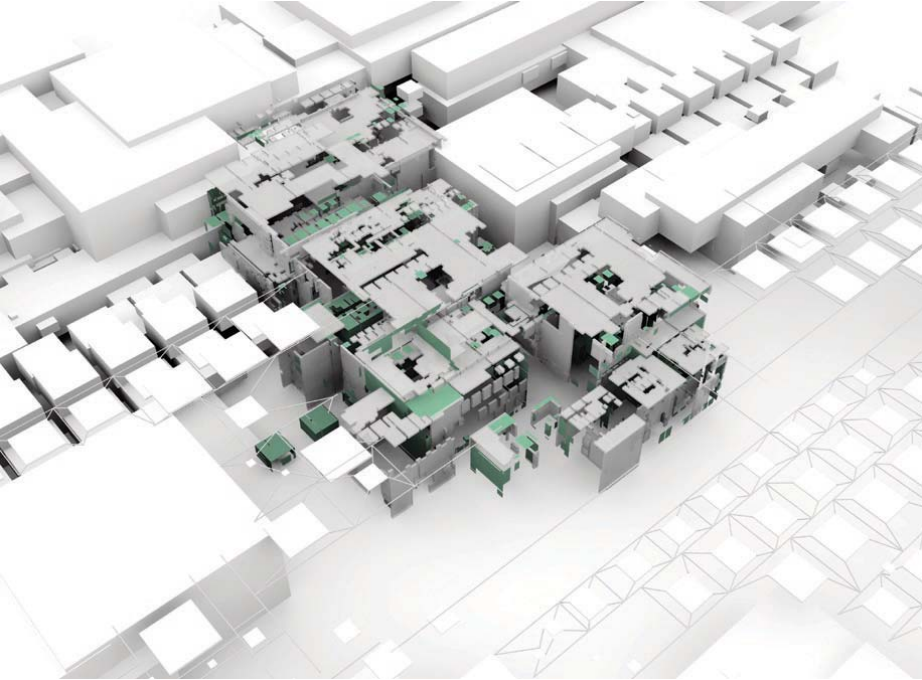
Parametric Distortions in a Locally Dependent Field
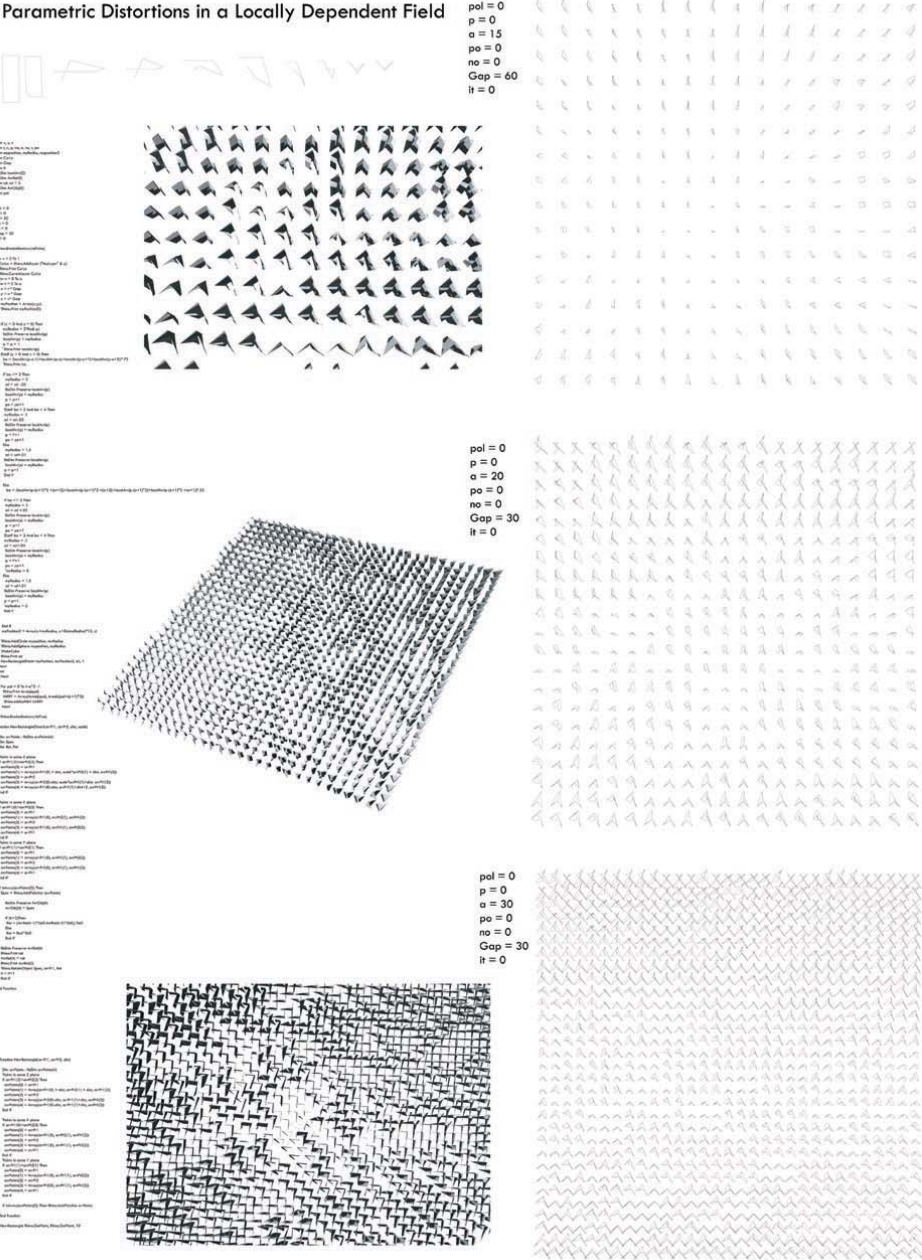
ARCH 602
DESIGN STUDIO IV

This is the first of three elective studios in which each instructor develops their own pedagogical agenda and students choose from among these options.

FROM XANADU TO CHENGDE
Bishu Shanzhuang, the imperial summer residence of the Qing emperors, is located in Chengde about 200 kilometers Northeast of Beijing. Beginning in the late 17th Century, the Chinese court would relocate to this "Mountain Resort" during the hot Beijing summers. During the 20th century, the site was badly damaged by plundering Warlords, the Japanese and Soviet occupations, and the Cultural Revolution. Since the opening of China in the 1970's, Bishu Shanzhuang has been extensively restored, and transformed from a symbol of Manchu imperialism to a place of national pride. The extensive gardens, temples, and palaces have been declared a World Heritage Site, and international tourists mingle with the locals and Chinese tourists, now traveling in great numbers to important sites in their own country's history.

Chengde City (pop, 670,000), adjacent to Bishu Shanzhuang, was the site of cement and ceramic factories with considerable pollution, but is now rapidly developing as a tourist center in the greater orbit of Beijing. Concentrated efforts are being made to clean up the surroundings, improve air quality, provide good housing and improve infrastructure including an expressway to Beijing.

This was a joint studio with Landscape Architecture students. It concentrated on identifying critical conservation and development issues for Chengde City (pop. 760,000) and Bishu Shanzhuang, with a goal of creating radical and innovative new strategies for urban China, as well as options for the conservation of significant natural and cultural resources. Emphasis was placed on the understanding of China's long history of urban design, along with the tremendous opportunities for new urban definitions and possibilities in the current time of extremely rapid economic growth and development. Innovative responses to cultural and environmental tourism were studied, as well as the issues of housing and urban amenity for the local residents. The studio traveled to Beijing, Chengde, and Shanghai to understand the site and contemporary conditions in China, and to work directly with Tsinghua students and faculty. During the last half of the studio, students developed specific projects in cooperative landscape and architecture teams, with strong emphasis on environmentally and culturally appropriate solutions to China's burgeoning development needs.

JONATHAN FOGELSON WITH PATTY WEST: The significant cultural and historical site of the Chinese Imperial Chengde Summer Palace has all the potential to become a well used public amenity and global tourist attraction. This project reconnects the city and palace through an appropriate mixed use area which is part of a greater public open space system. To create a contemporary urban environment that is appropriated to its site studied traditional and existing streetscape and building massing.

The difference in elevation on the site creates the opportunity to melt landscape and structure into one, where rooftop gardens are in the public domain, elevated walkways seamlessly connect with sidewalks, and semi-submerged shops have street frontage and ample natural light. The sunken commercial area does not obstruct views of and from within the palace, yet does not constitute an oversized and undefined open space. The East/West connection is articulated by an alley of trees, bringing pedestrians to a relocated canal and the waterfront park, which emphasizes a culturally significant view corridor towards Buddha Park.

RESEARCH FACILITY MOTEL AT THE SANTA FE INSTITUTE (SFI)
The most beautiful thing we can experience is the mysterious. It is the source of all true art and science.
    —Albert Einstein (1879–1955)
The Santa Fe Institute is devoted to creating a new kind of scientific research community, one emphasizing multidisciplinary collaboration in pursuit of understanding the common themes that arise in natural, artificial, and social systems. The SFI seeks to catalyze new research activities and serve as an institute without walls.
    —SFI Website
The studio's objective was to design a research facility for the SFI that also accommodates visiting scholars and students for the duration of their research projects. The "Research Facility Motel" was designed based on principles of scientific collaboration and project-based temporality. Located in Santa Fe, New Mexico this facility will challenge conventional design strategies and attempt to formulate dynamic principles for the design and program of the motel.

ISAAC (CLAY) COFFEY: Drawing from the research of the Santa fe Institute this project creates topological space by mining topographic complexity. Curvature graphs are used to map topographic intensities and describe the landscape as field of continuous change. These graphs are reinterpreted through the parametric software, GC, and become and armature for architectural invention. The form of the research motel re-contextualizes the form and complexity of the surrounding landscape.

t1_Manifold Range

a

b

c

The range to the right are examples of sample site conditions. if we assume these results are typical to this landscape then we can begin to define and optimize potential construction sites
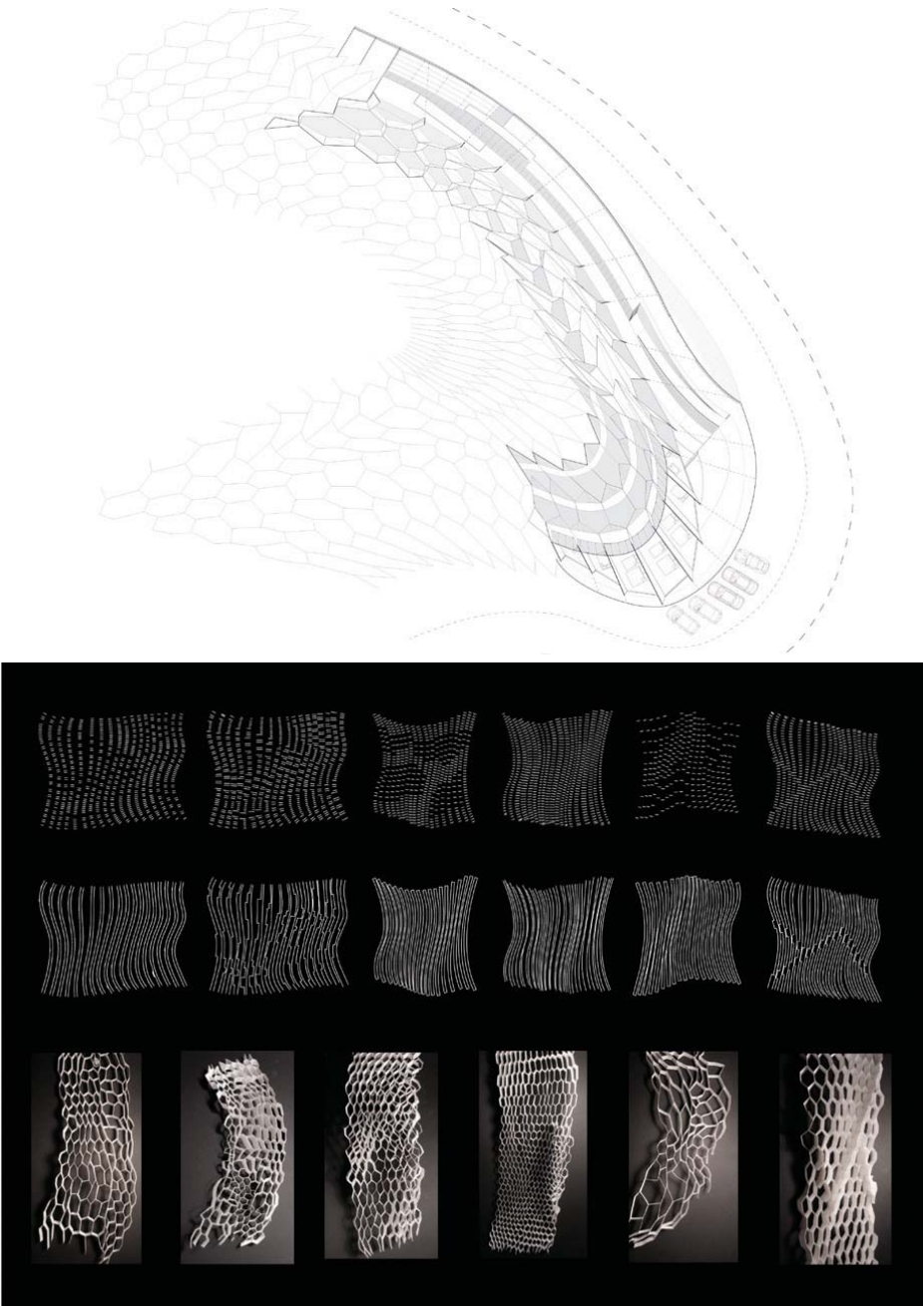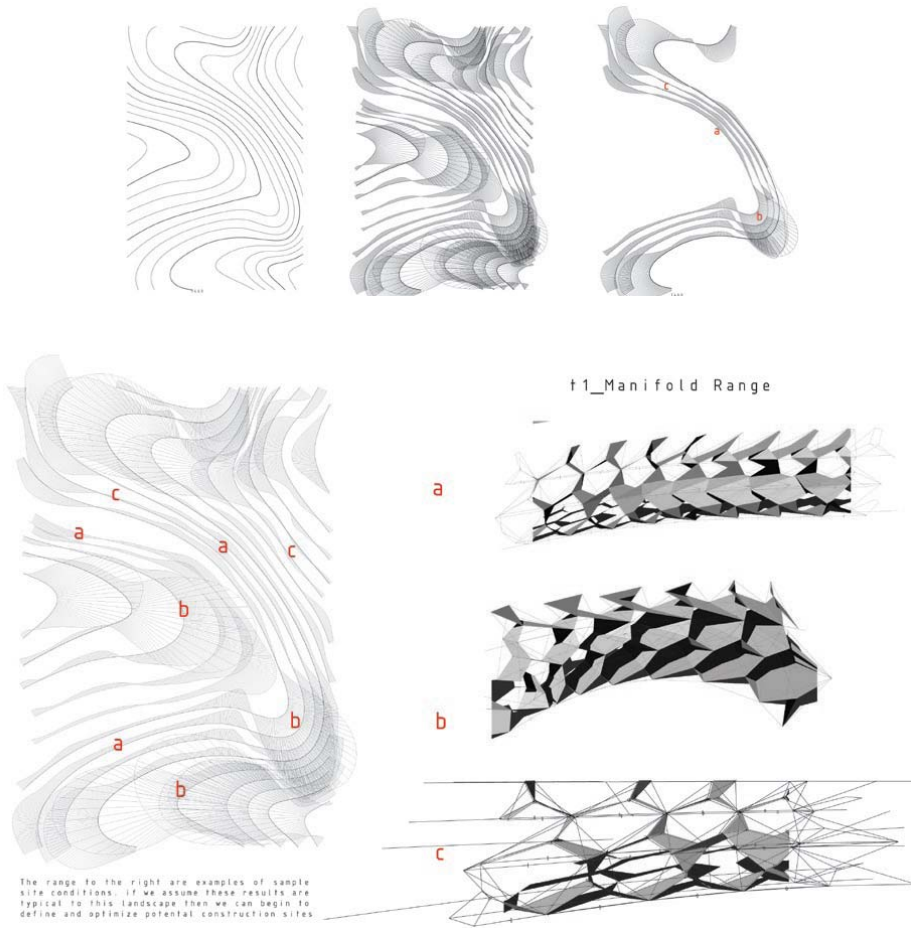
The studio's overall objective was to establish a cultural campus as a new social and cultural focus of Philadelphia. The studio's site, Fairmount Park was studied as both a cultural and event space, and as a catalyst of the growth of this part of the city. The campus was intended to be constructed as a cutting-edge facility that would satisfy an international role as one of the leading cultural developments in the world. It should establish a strong self-identity, representing a national and regional culture that elaborates on Philadelphia's existing social character. The sufficient size of the campus site, and the location of each element within Fairmount Park will characterize it as a cultural facility "within" a park but also a facility "as" a park.

STEPHEN GIORGIO AND LISA SCHWERT (below and upper right): The studio's intention was to design a contemporary cultural center within Philadelphia's Fairmount Park. Through extensive site analysis, formal and programmatic studies a site within the park was chosen based on its access to exceptional city views, potential park connections and interface with the existing highway. Through the employment of an organizational system based on site data matrices and programmatic relationships and an interactive, light polarizing skin a building was developed that allowed for fluid interaction between myriad cultural programs, the framing of beautiful views of the Philadelphia skyline and art mixed with speed and movement.
WAYNE NORBECK (below right): The premise of the project was to explore an apparent dichotomy between a digital arts museum (virtual space) and the extraordinary environment of the park (physical space). A combination of public pathway and museum spaces occupy a media display box-truss bridge that spans the Schuylkill River. The crossing of the bridge with a new promenade and wetland landscape creates a campus-like concentration of public spaces, and the media bridge allows for varying perceptions of the landscape.
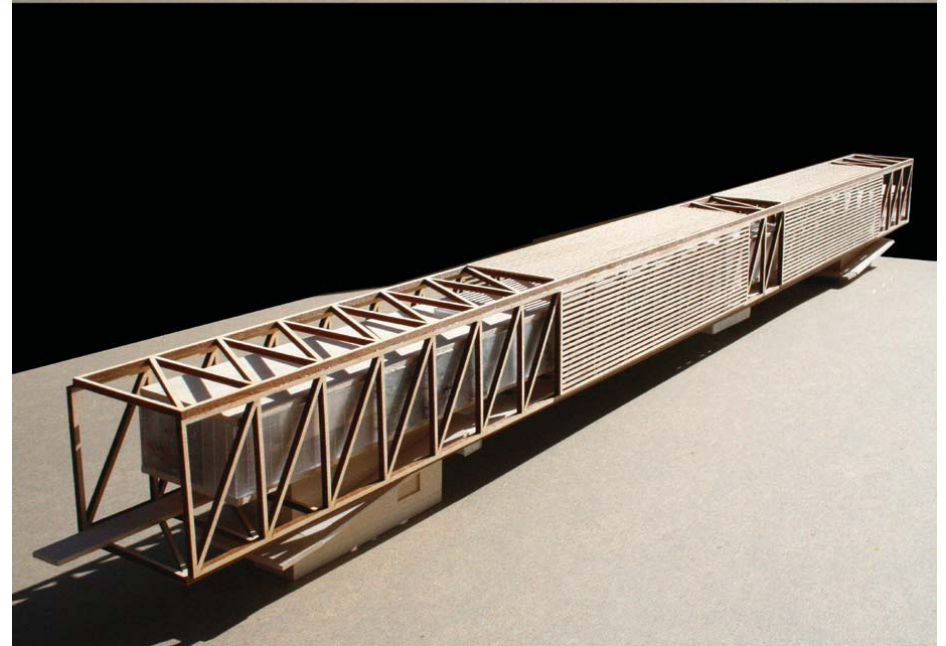
THE ARCHITECTURE OF SAFE ZONE CAPITALISM AND OTHER FORMS OF PRIVATE ENTERPRISE
When is discretion and anonymity ever at odds with architecture? If and when a premise such as discretion begets privacy and personal safety is applied to architecture and its role as shelter, how would it alter or challenge ideals of image and aesthetics and the perception of value toward ensuring privacy and safety?

   The generation, articulation and deployment of new architectural typologies have emerged of which each carefully correlate its designated role to one of the following: spectacle, infrastructure or anonymous fabric. As these types continue to evolve beyond purely programmatic and visual considerations to become more adaptive and spatially responsive how do they prepare to deal with such realities as discretion, anonymity, private lives, black market commerce, and crime—those complex yet discrete networks that exist as part and parcel of globalization's domination.

   To facilitate this inquiry the studio designed a *hotel*.

PETER RAE: The hotel began with investigations of lines of circulation and neutrality, or information spaces as they relate to the interior or exterior of the building. User profile research as well as site analysis supported these investigations and yielded valuable results which led to the formal and spatial composition of the project.
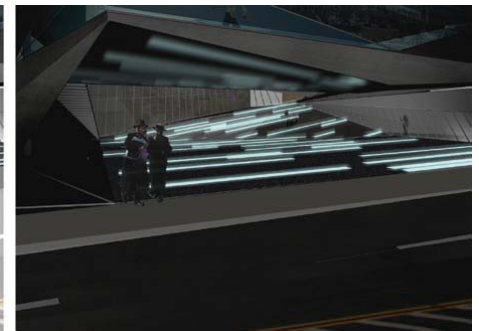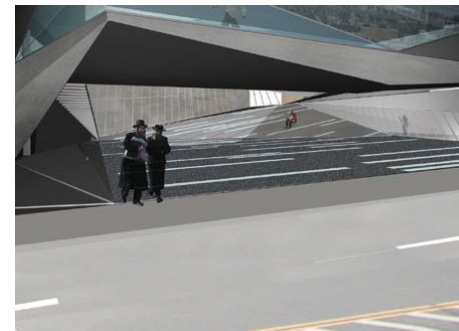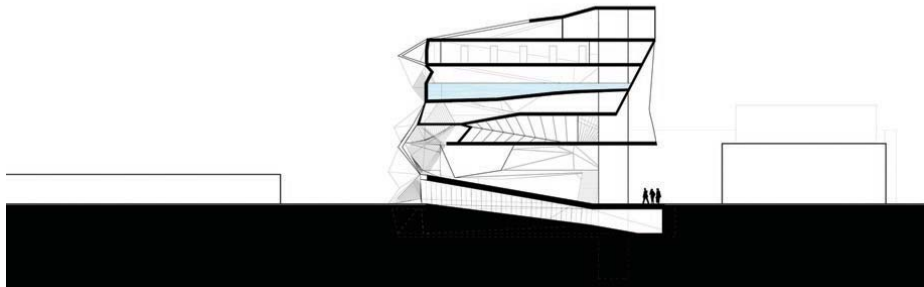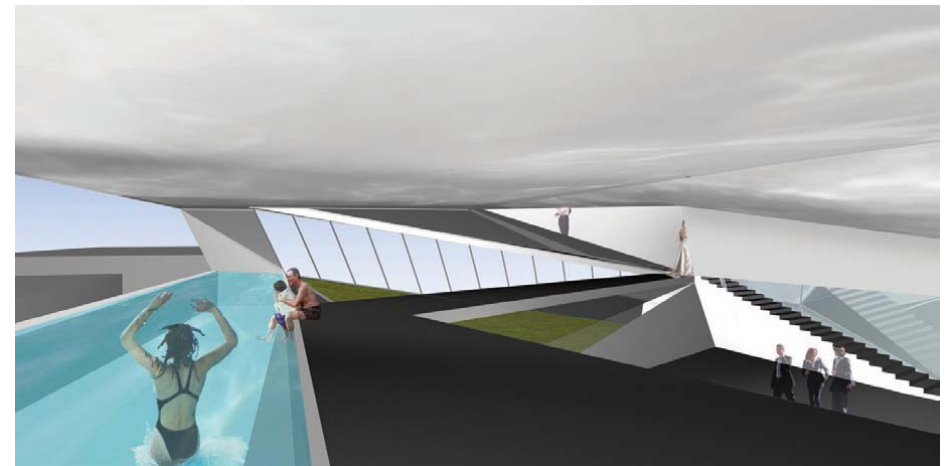
PUMP AND GO: A RETURN TO THE AUTOGENIC

The objective of the studio was to provide a pedagogical framework for the gestation and significant development of a generative architectural design imbued in the complexity of program, tectonics, context, and urban ontology. Many of the departments and faculty at PennDesign, motivated by the success of their academics programs/mes, unmoved by the lack of synergy of the University at large and concerned with the lack of community engagement, quietly commissioned this studio to undertake a redesign of the existing premises. The site for the future "Meyerson Hall", its expanded size, and the departmental organogram remain contested issues.

   The redesign of Meyerson Hall is a highly specific and demanding architectural problem. The generative techniques that would configure relations between the different number, scale and nature of program components were engendered from individual analysis and critiques of the existing conditions. As design bases, the analysis and critiques were complemented by the tangible desire of transforming one's environment and the knowledge of PennDesign's current multilayered predicament.   In turn, the studio explored formal and compositional generating techniques to codify, configure and amplify the demands on architecture. Besides the Autogenic period of the late 1960s, the studio examined a generative mode of design that has since been associated with more "fluid" European architectural practices, e.g. the Dutch Model. A subsidiary purpose of the studio was to imbed these design modes within other more rigorous architectural techniques. These techniques tackled questions of geometry/morphology, structure/materials, typology/topology and building systems. Ultimately, the intent was to create a developed and complex type; in so doing, new techniques -representational and otherwise- were developed.

CHAUNCEY HERMAN: A system of interlocking departmental units weaves to create a whole with unique programmatic juxtapositions and viable interstitial spaces to be allocated for communal use. The progression from the entry level to the top level allows users to seamlessly navigate within their own department, while not losing the visual and or physical relationship to the other departments. As one moves up through the building, departments go from segregated and specific, to completely ambiguous, where spaces can be used for a myriad of programs. The ultimate goal was to create a building that allows for easy use and clear departmental spaces, while providing and encouraging interactions and free communal spaces.
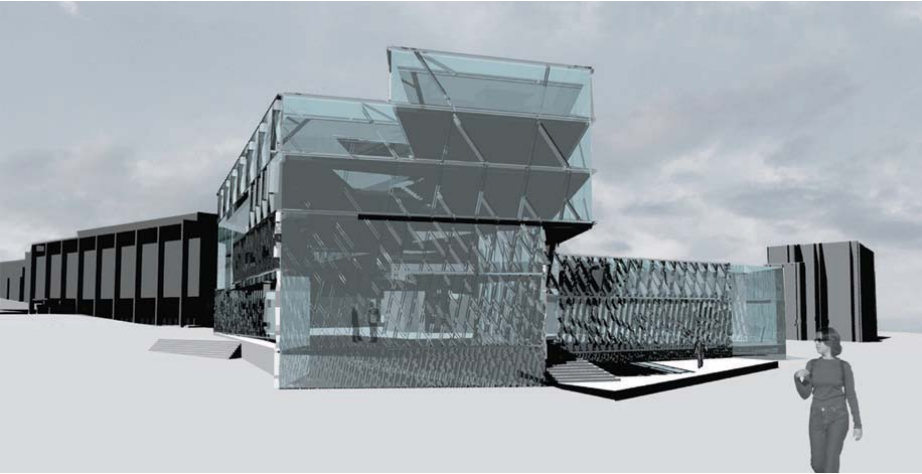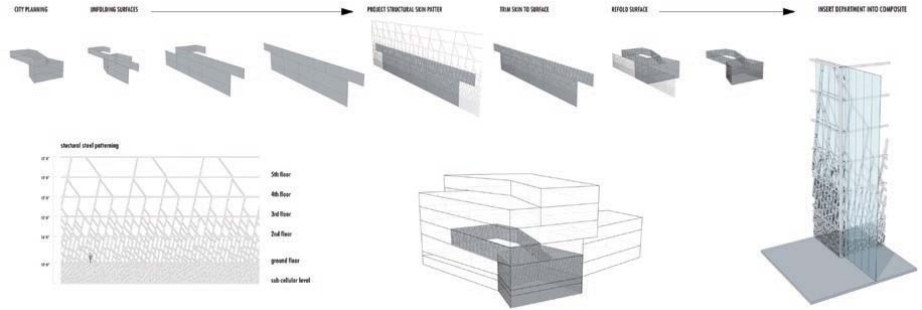
configuration process
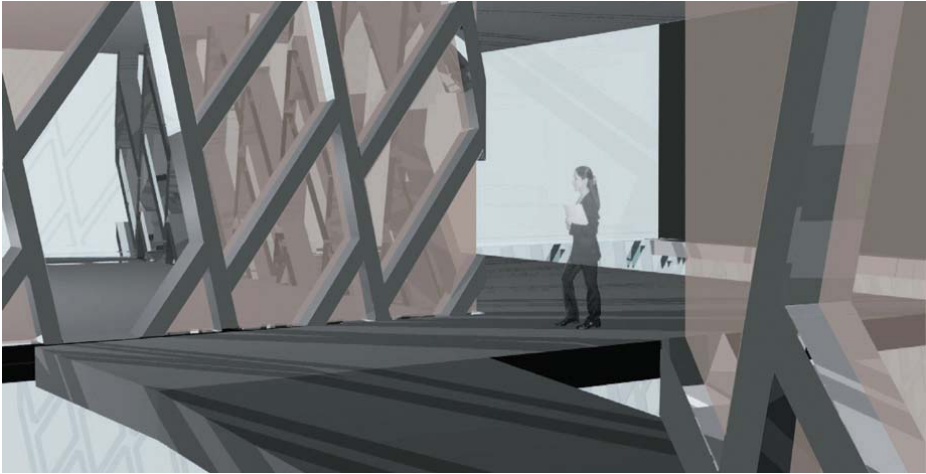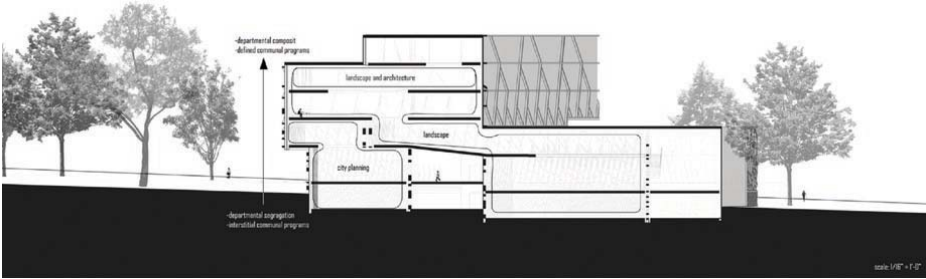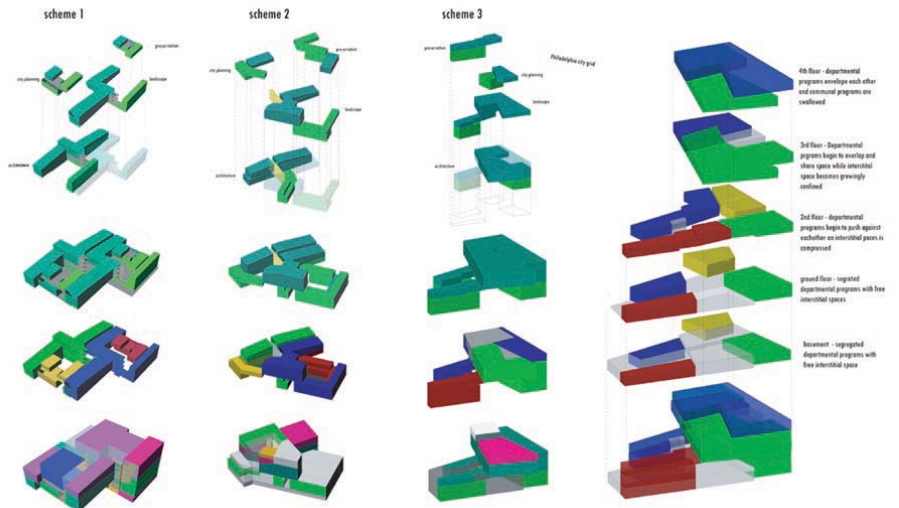
RESILIENT TOPOGRAPHIES

A surface at risk is unsteady ground to consider a new architecture. When the front-page urgency of Hurricane Katrina shifted to the uncertain speculation of what legislation, financing and design strategies would establish the terms of rebuilding, the studio contended that this catastrophe brought into focus the imperative to consider a more agile and resilient surface for inhabitation. The studio considered tactics and strategies that might respond to a series of questions. What new models of inhabitation can exist with the indeterminacy of the surrounding waters? What strategic reconfiguration of the city surface will provide a resilient base for higher density inhabitation? The studio envisioned new inhabitable infrastructures that redefine the relationship of water and land, inhabitation and infrastructure, and landscape, both constructed and opportunistic.

A field trip to New Orleans preceded a three-part investigation. First, the man-made structures invented to allow habitation of vulnerable land: levees, canals, dykes, gates, revetments; second, the utopian and real models for high-density inhabitation including a range of inhabitable infrastructures; and third, the specific conditions that inform the constraints and opportunities to rebuild New Orleans. While the defensive condition of the water's edge in New Orleans is essential for its survival, the studio challenged the current planning assumptions and proposed new prototypes that redefine the relationship between land and water, landscape and home, proposing more contemporary ways of living on a fragile edge.

JULIET LEE: As the amount of habitable land continues to diminish with the effects of global warming, New Orleans must consider building vertically on the high ground if they are to ever return back to a pre-Katrina population. A high density cityscape configures itself into a streamlined system of housing building vertically upon a horizontally moving public market of transportation and circulation. This prototype is deployable at the water's edge, while the low ground areas are allowed time to heal and restore back into wetlands.

SITE PLAN_ scale 1 : 100

LONGITUDINAL SECTION bb'_ scale 1 : 50

ARCH 701
DESIGN STUDIO V
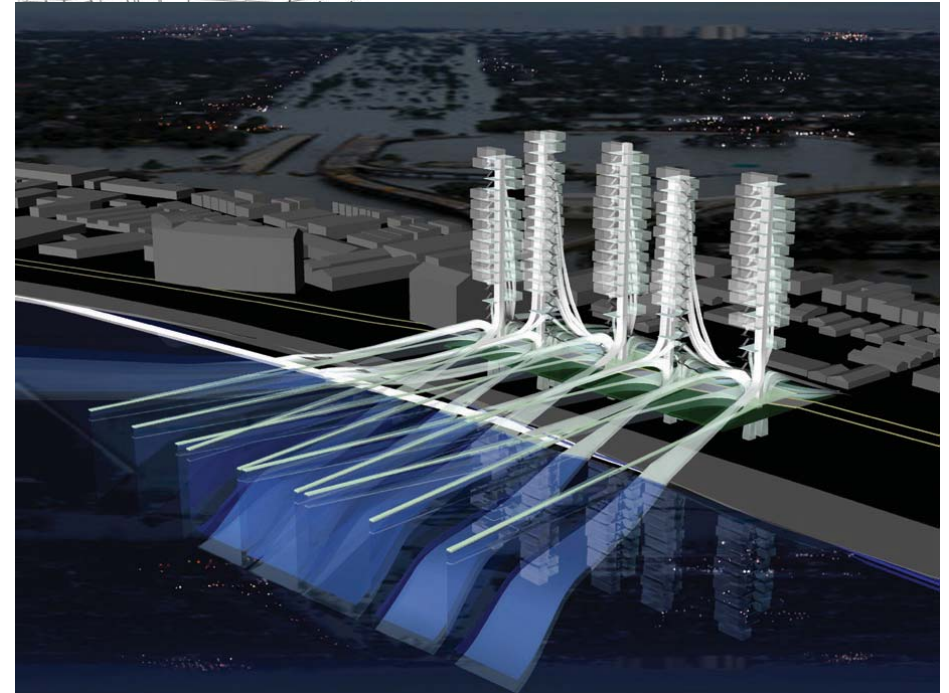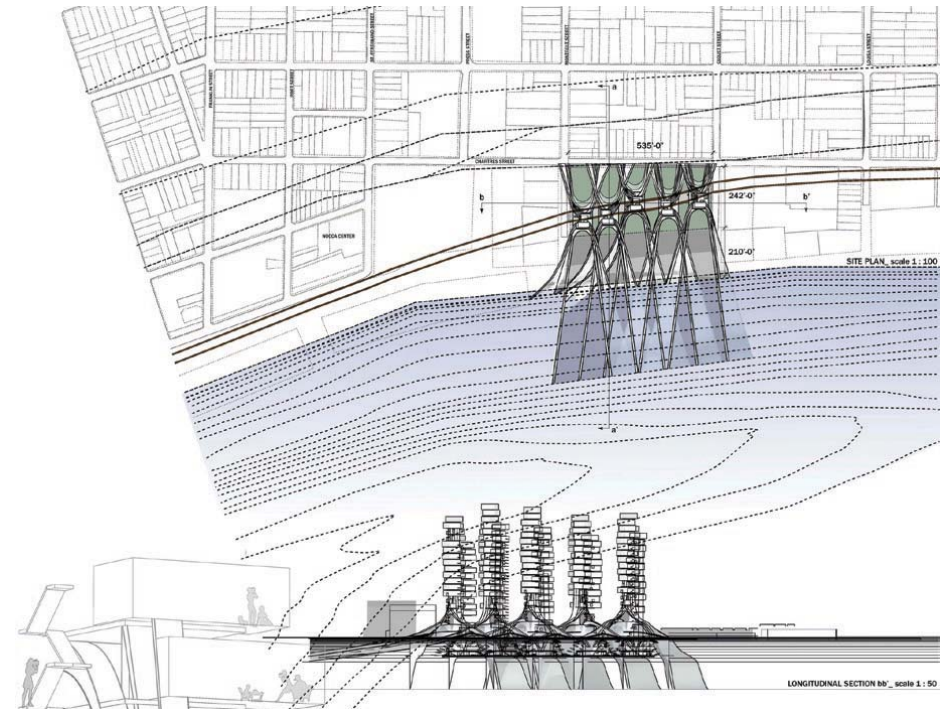
This is an elective studio at the advanced level in which each instructor develops their own pedagogical agenda and students choose from among these options.
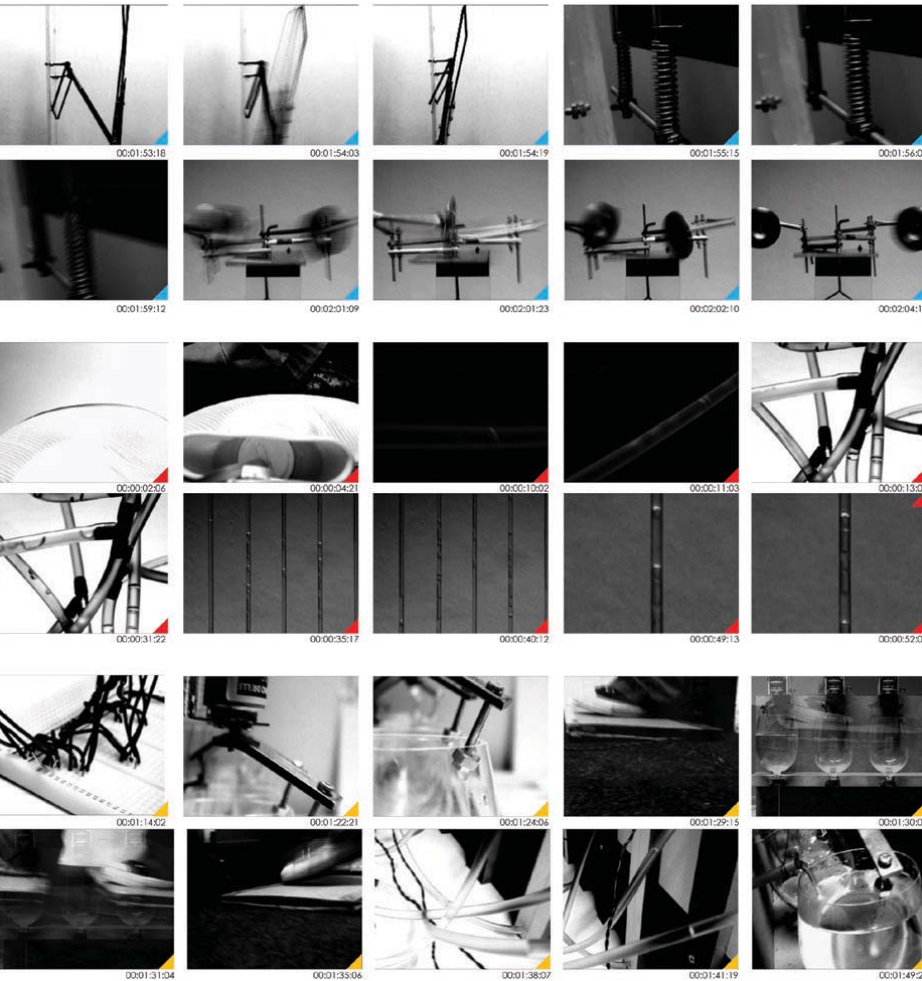
THAMES, THE RIVER—THE CITY: COGNITIVE WALK, HAPTIC CROSSINGS
Moving pictures can still do what they were invented to do a hundred years ago: Move.
    —Phil Winter in Wim Wenders's *Lisbon Story*
Pictures will become an environment, an architecture.
    —Gerhard Richter
At the interface of the river and the city, our movement and that of the river reciprocate. Walking the city captures a shifting environment releasing dynamic instabilities within its hard constructions. Interiors and exteriors interweave, people, things and places conjoin to produce the momentary and momentous events of the passage. How do we mentally record, bodily capture and visually perceive these passages? How do these crossings between the Thames and London at this time produce an environment, project events and a psychogeography of a place? How are these recordings able to help us envision its contemporary urbanism?
The subject of the studio involved a cognitive walk- crossing the physical environment with our mentally understood maps- and haptic crossings, where our body, its motions and emotions contact and interact with the surface of the city in its crossings with the river.
    The medium for documentation/ production of the project was a digital film which constructed the environment of the crossings with the river. The film and analytic drawings of its architecture constitute documents that produce the final physical space of the project presented as a model passage—experience of the walk intersects with its representations where focused crossings of the haptic and the cognitive experience of the river and the city were acted out and tested.

LANG CHENG, DO-HOON KIM, MYUNGHOON KIM: Each team member designed a machine that records a specific site event by converting event energy into both sound and display. Ultimately the outputs (recordings) of three machines were mixed to create an orchestral environment.
The three machines record:
Water Momentum: impact of Thames water to the city embankment—tide level + kinetic forces (Cheng)
Water Control: people affecting water—water level (D. Kim)
Accessibility Vector: people's lateral and parallel access to the River Thames—magnitude + direction (M. Kim)
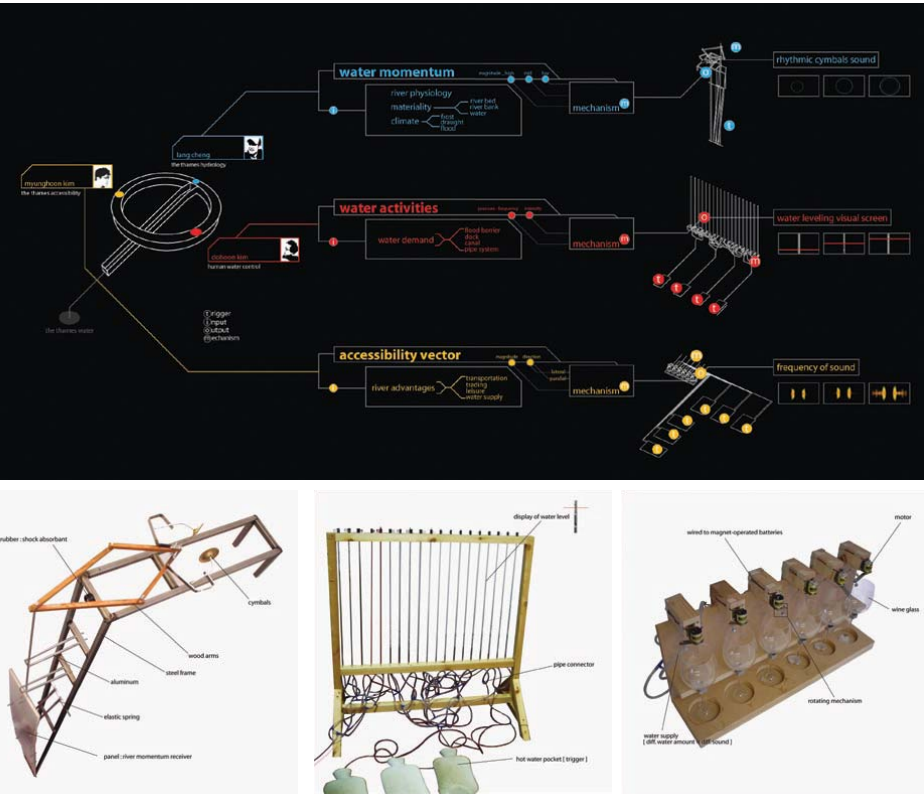
INHABITING THE CLOUD FOREST IN THE PLATEAU REGION OF COSTA RICA
This studio included seminars on lightweight structures, workshops on the deployment of building structures and skins, computer simulation of structural behavior, and workshops on the interpretation of the climate of the Costa Rican site.

The site, the Villa Blanca Cloud Forest Hotel in San Ramon, is a hotel-resort property that emphasizes an ecological policy. The studio explored the architectural possibilities for growth (to include a spa) and change (expression of ecological principles) of this property. A Cloud Forest Private Biological Reserve surrounds the 3,000-acre property.

The 'growth' encompasses new private suites located in and around the trees at the edge of the forest. These cabins were to make a minimum impact on the forest ground and trees. We imagined the new suites to be 'hovering' (suspended between the earth and the sky) in the forest. The location of a 'wellness spa' is within the skeleton of an existing shed (40m x 20m x 16m high).

The 'change' proposes that the present architectural 'style' of a Spanish hacienda and farm village will be superseded by an ecological theme that emphasizes the ecology of the site, climate, and use of regional building materials and deployable methods of construction, that is, a theme of 'genius loci,' or 'critical regionalism', while at the same time emphasizing emerging structural systems.

ALEJANDRO BIGURIA: Ecotourism is defined as "the purposeful travel that creates an understanding of cultural and natural history, while safeguarding the integrity of the ecosystem and producing economic benefits that encourage conservation." My design explores an architecture that will complement nature rather than disrupt it. It seeks to diminish its physical and visual impact on nature. Only through a symbiotic relationship can architecture become part of an ecosystem. This architecture looks into immersing the visitor in nature, while maintaining a suitable comfort level. Only through a complete immersion in nature can one appreciate its richness.
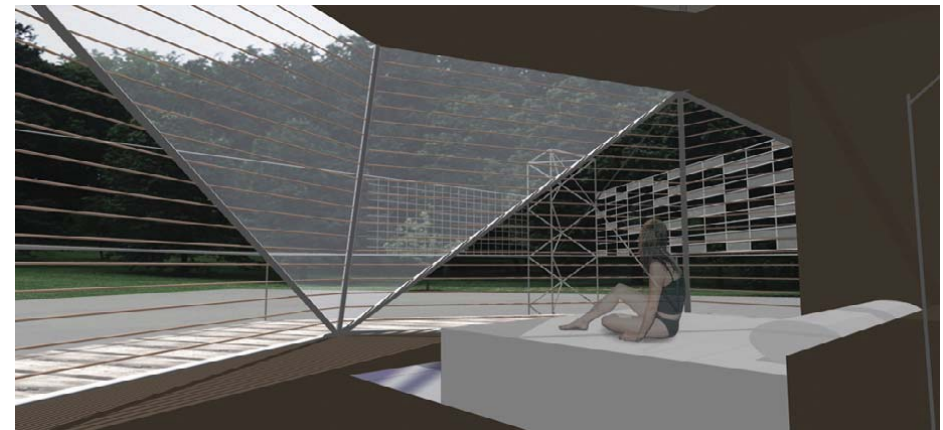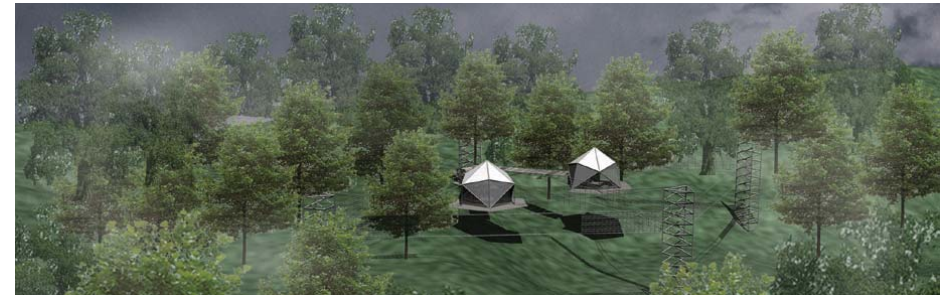
PATTERNS OF LIVING: THE FUTURE HOUSE
This studio addressed contemporary living that responds to changes in our routines of inhabitation catalyzed by the advent of digital media in an age of connectivity. Dalibor Vesely and a Walter Benjamin suggest that new and unforeseen modalities will be produced for future dwellings and that the house must contend with a world caught in the delirium of progress. It cannot rely on the past, but must negotiate the uncertainties of the future. The uncertainties are to be translated into a specific architectural vocabulary, which is to engage in the transformative projection that is peculiar to architecture itself.

The intention of the project was to develop future patterns of living by exploring its use in conjunction with site and program as differing but interrelated conditions. Investigating the threshold between interior spaces, edges between city/nature, natural/cultivated landscape and site interpretation prompts space-making that registers and articulates existing urban and natural conditions with patterns of living. By organizing specific topographic and programmatic elements in interpenetrating settings, the project aims to provide the house of the future.

JEFF CHEN: Fluid dynamic effects were used to develop a family of components for a hillside residence in Beverly Hills. A circle packing algorithm, controlled by existing site conditions, modulated the compaction of space. The techniques provided a means to reformulate domestic relations of space, structure and site through the resultant behaviors of a time based system.
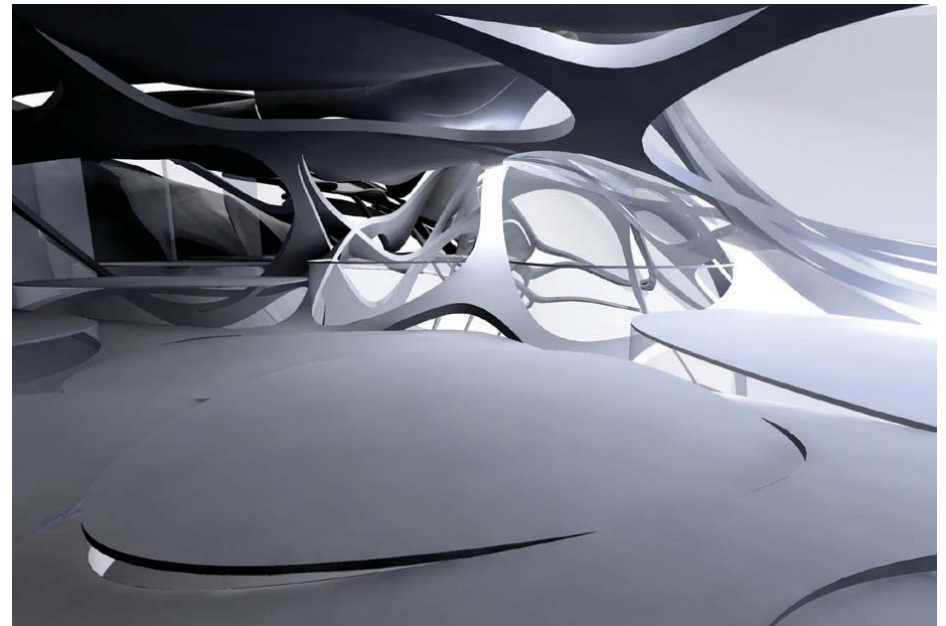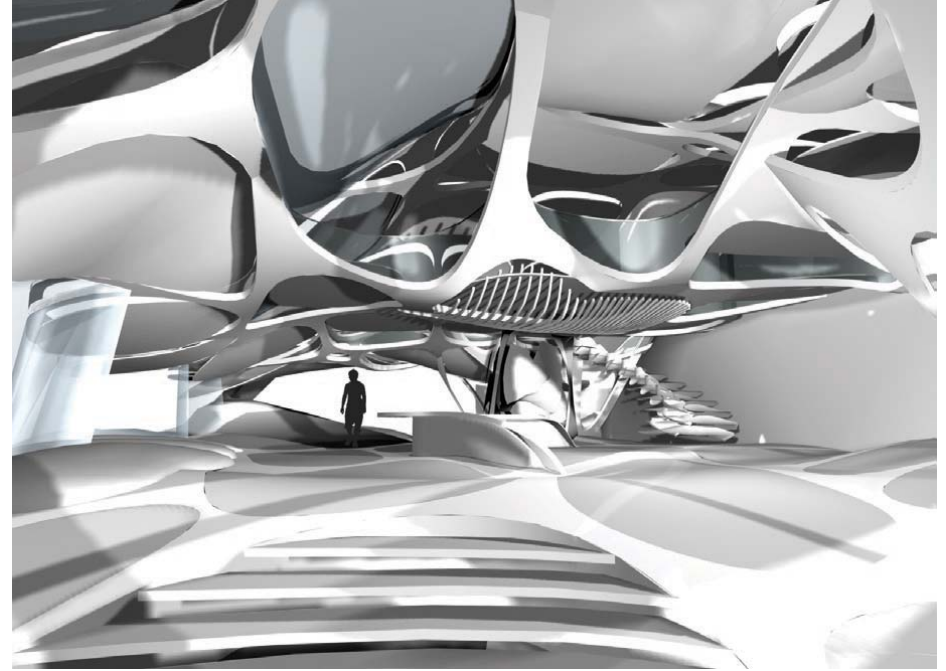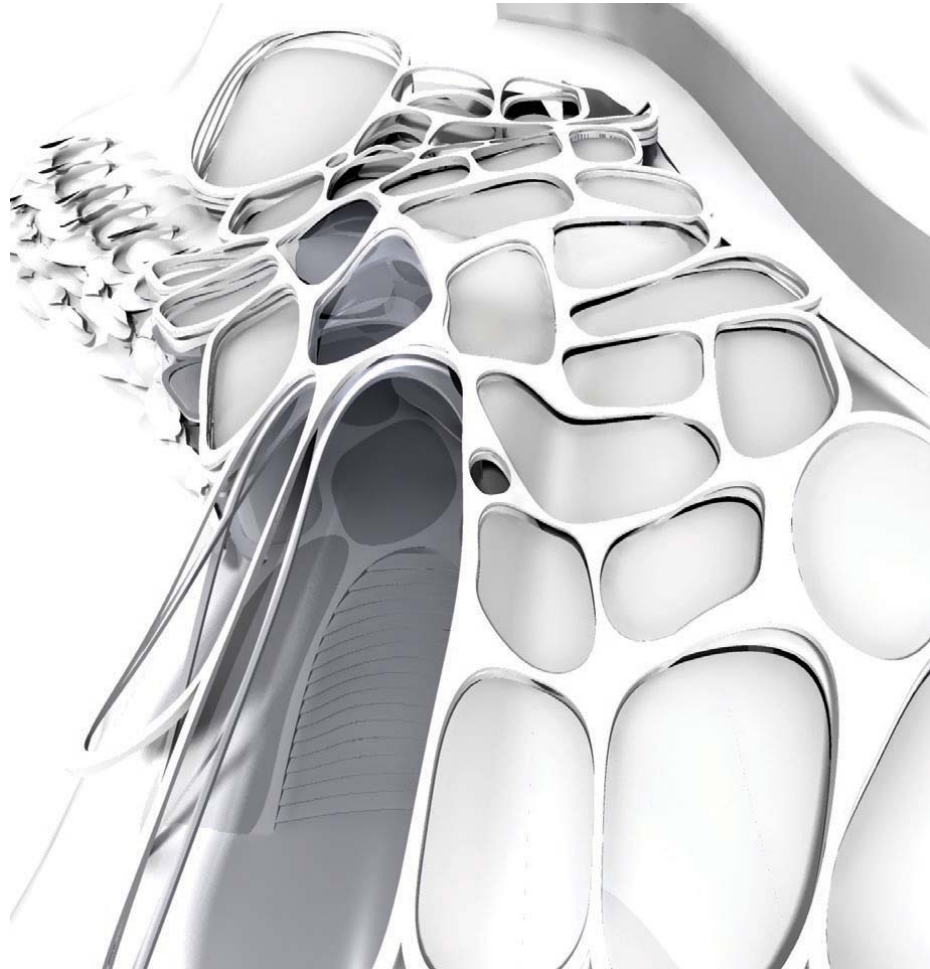
EARTH CLIMATE AMBIENCE LIFE
…anti-institutional, in touch with the environment, hospitable to myth and ritual, alive to the poetry of wilderness, ambitious in the desire to touch the public through a vision of monumentality that throws the world of the shopping mall and the parking lot into moral perspective. —Danto, Arthur C. "The American Sublime." *The Nation*, Volume 281, Number 8, (2005).

The studio researched and developed an approach to program that begins with a serious inquiry into the ethical and environmental conditions of site. Research focused on sites in the Brazilian cities of Sao Paulo and Salvador de Bahia, examining the dynamic relationships between place, program and material. The inquiry was marked by direct observation of the dynamic relationships between building use, construction method and material, and the physical and cultural environment. The goal was to explore the potential for sites as programs, as architectures, which contribute to the public and to the city in tangible ways, both through their realization and their subsequent use. The work of Lina Bo Bardi provided an historical framework for this exploration.

The design of intelligent, ecologically responsive surfaces that engage specific environmental conditions using new or invented materials and assemblies was the starting point for the research. Students traveled to Brazil to make a careful study of the work and met with architects and professors from the University of São Paulo (USP) and the Instituto P.M. and Lina Bo Bardi. Themes of "everyday technology," Tropicalismo, Brazilian urbanism and the work of Lina Bo Bardi and other São Paulo architects and artists provided background for the research. An exhibition that includes completed work by the studio is planned by the Instituto P.M. and Lina Bo Bardi. The 2004–2005 Rotch Traveling Studio Scholarship was awarded for this studio and provided funds for travel to Brazil.

ISABEL CASTILLA: The site, situated next to a bus station under the Avenida do Estado viaduct, in the center of Sao Paulo, is part of a big network of residual spaces that have emerged from the unplanned introduction of highways and viaducts into the city fabric. With a careful understanding of the programmatic conditions that surround the site (bus station, markets, cultural centers and recreational spaces), the project looks to create a hybrid program: a book exchange center/bus station/public marketplace that incorporates some of these existing programmatic conditions while proposing new ones, creating a permeable programmatic spine that ties together all the disparate points of activity of the surrounding areas. A system of platforms and ramps accommodate the different parts of the program, creating several degrees of permeability and connection while a modular system of concrete units accommodate the different programmatic elements articulating the space and circulation, such as display areas for books or merchandise.
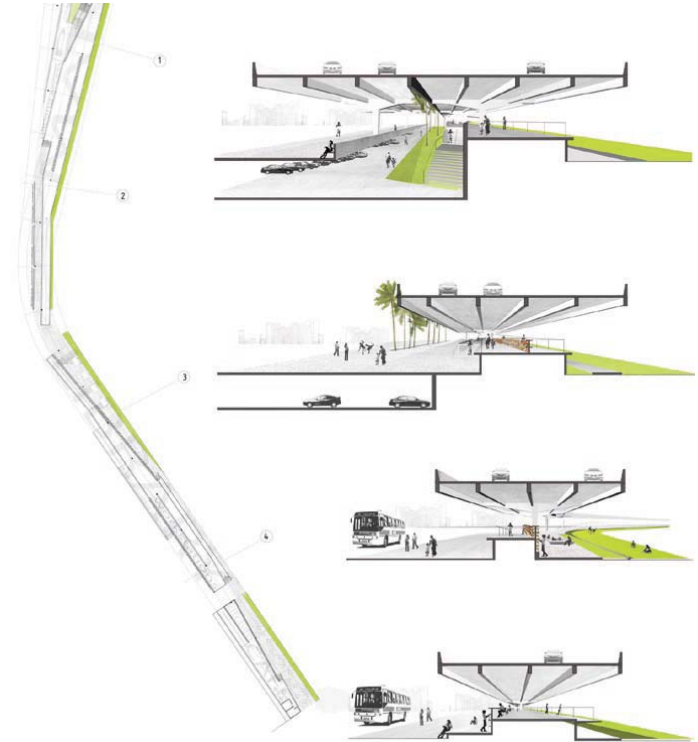
URBAN OBSERVATIONS: [FOLK ART / MEMORY + CABINETS OF CURIOSITIES]
Cabinets of Curiosities, intimate memory theaters, are spatial constructs "containing" collections dramatizing personal and collective pasts. They suggest the presence of memories through an association with objects, texts and images, often through their spatial relationship one artifact to another.

   Our studio work focused on "trivial matter". That is, we looked at inconsequential particulars, often overlooked details and the physical flotsam and jetsam of everyday life. Study methods were open-ended and speculative, that courted risk and chance. The setting for the study was the site for the future home of a new charter school for Philadelphia Chinatown.

   The eventual focus of our work was the design / build of site-specific architectural elements and "cabinets" for a collection of cultural artifacts, secrets and ephemera. The collection was based on various "contributions" from students, founders + faculty of the Folk Arts Cultural Treasures School [FACTS].

GRAHAM BAILER, PAM JORDAN, LEILA KANAR, JI YEON YU: As a team, we decided that the success of our design would be derived under the premise that all catagories of objects must occupy a specific place within the container; at the same time, none could be revealed too quickly. The technique relied heavily on position + orientation: the viewer must actively engage the display and can only grasp its complete presentation after traversing the display, gathering partial glimpses and "constructing" it entirely.

   Through this situational context, the emphasis is placed on the relation of one object to another, as opposed to specific objects themselves. To disallow a single omnipotent view, the translucent qualities of the WhoAmI cards and Archives (printed on acetate) are strategically placed to screen the 3-dimensional object. Ultimately, the table functions through an integration of all vantage points and cultural insertions; gleaned relationships will vary widely depending on the contents.

ARCH 703
WENDY EVANS JOSEPH SPONSORED STUDIO / WINKA DUBBLEDAM WITH LUCA GALOFARO
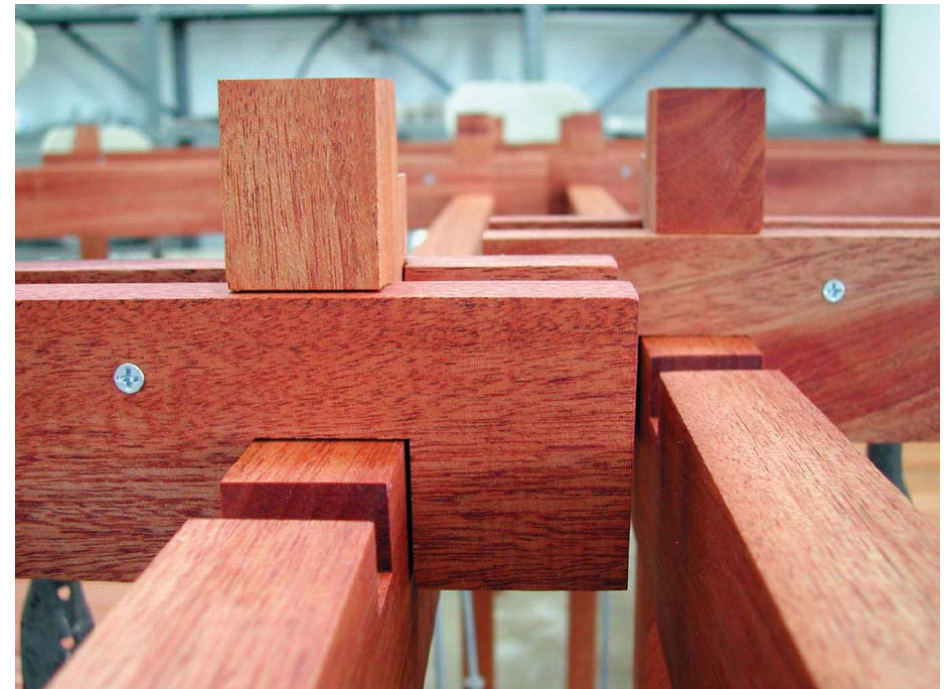
DYNAMIC SYSTEMS

The Fall 2005 studio looked at the current situation of mid-European cities and, specifically, Rome. Mid- European cities have for a while been in a very specific state of suspense; their history seems to literally weigh them down. Recent writings of Manuel De Landa (*A Thousand Years of Nonlinear History*) study these city developments, understanding urban structures as networks, hierarchies and meshworks. The studio researched the explicit meanings, differences and similarities of the terms 'networks' and 'meshworks'. The students created a digital archive with logistics, urban mappings and scenario diagrams. The aim was to devise either an attractor or aggressor which would have a spin-off effect on its surroundings. This newly inserted hybrid space, at once local and global, big and small, public and private would behave not dissimilar to the behavior and growth of organic systems. Characteristics of these Organismic systems are morphological plasticity, physiological adaptability and behavioral flexibility. This terminal space proposes the production of a new space, organic in character and critical in its reading of Rome.

BRIAN HOLLAND: A "bottom-up" agricultural enterprise is proposed for Rome in response to a critical gap in humanitarian food aid supply flows. The project is strategized as a series of seeding operations intended to harness the dynamical processes of decentralization and self-organization, beginning with a series of small agricultural training facilities and culminating in a design for an Urban Agriculture Research Institute.

PUBLIC AGRICULTURAL PARK

AGRICULTURAL RESEARCH INSTITUTE

LARGE INDOOR GREENHOUSE BELOW

TERRACED HOUSING STRUCTURES

PRIMARY GREENHOUSE ENTRANCE

INDOOR HYDROPONIC FARMING TOWER

_PROJECT DESIGN PROPOSAL

ARCH 704
DESIGN STUDIO VI / RESEARCH STUDIO / ALI RAHIM, COORDINATOR
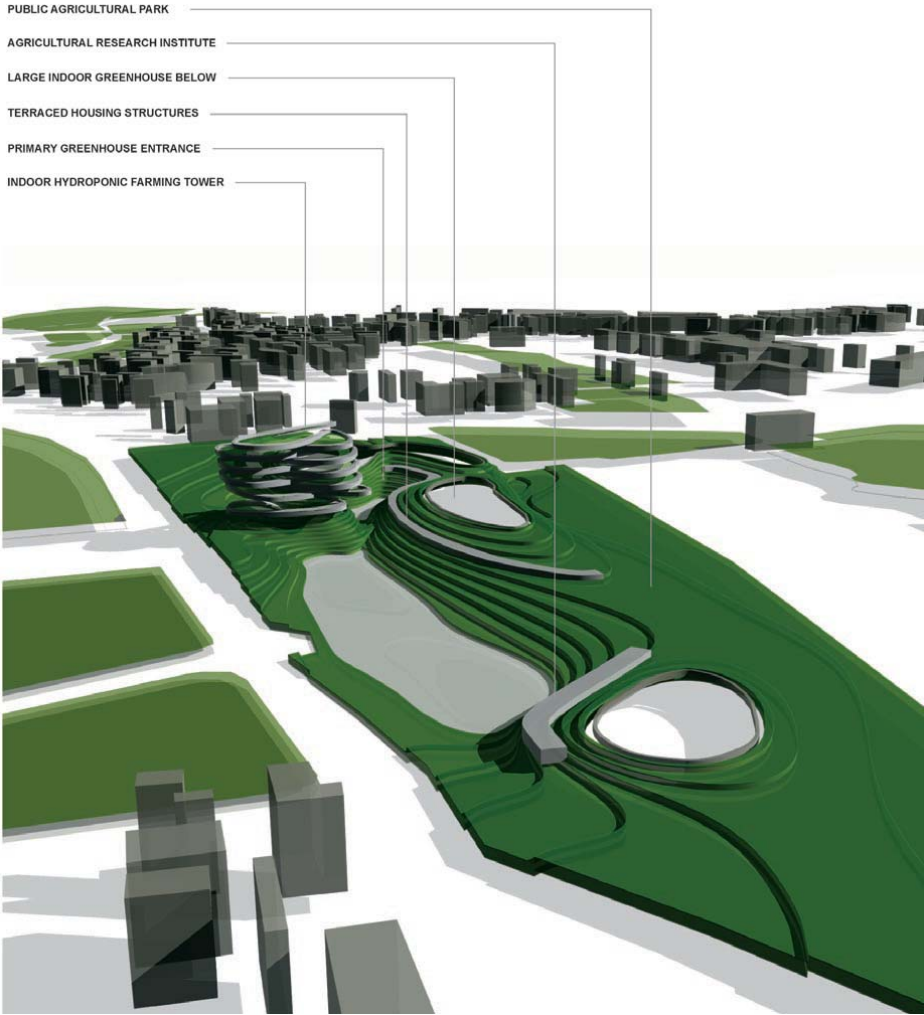
This is the final elective studio in which instructors develop their own pedagogical agendas, focused on their specific areas of research in design.
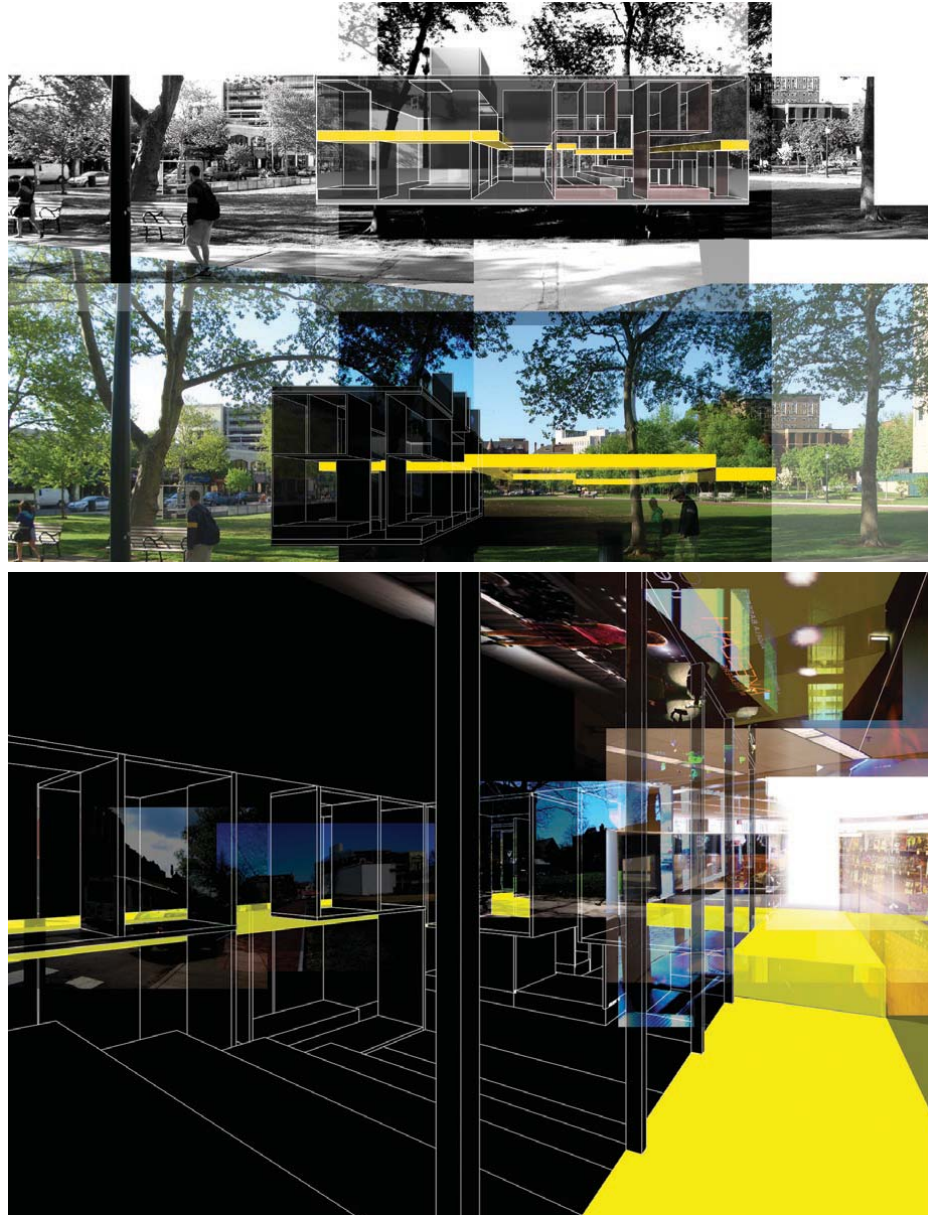
POROSITY: The increasing autonomy and self-reference of architectural systems has led to the construction of a paradigm of control that defines the condition of the contemporary building. Yet the boundaries of the system are questioned: from the exterior by new social forces, from the interior by practices which include external phenomena. The aim of the studio was to research the architectural implications of these border conflicts in order to develop new models of porosity, i.e. strategies that define radical environmental conditions of opening and closure. The notion of porosity operated in a double sense: on the one hand it questions the hermetic programmatic structure of social environments and its institutions; on the other hand it focuses directly on the potential of architectural material, its inherent capacities to mediate the instability of physical environments.

COMMUNITY: The notion of community is the theoretical umbrella under which the studio will investigate institutional constructions like education systems (with particular emphasis on the formative learning years), community centers, and cultural institutions and their recent interest in social environments. The investigation questioned the possibilities and limitations of contextualisation and formulated a radical position of building environmentalism, disability and access.

UNSTABLE SITE: The status of site oscillates between two extremes: on the one hand institutional models tend to produce a non-site condition, on the other they pretend to act as catalysts of urban planning aiming at reactivating entire urban areas. The site strategy of the research project was developed within the urban tissue of Philadelphia and students were asked to integrate explicitly personal narratives and autobiographical investigations.

MATERIAL CHANGE: Elements like walls, ceiling and floor are interpreted as material transitions between system and environment, as boundaries that define opening and closure. By using and abusing the contraction between the instability of external fluctuation and the stability of internal concentration, material research will generate a project based on different rhythms and gradual phenomena. As a tectonic detail, the material concretises different modes of perception: degrees of visual protection and exposure, rhythms of speed and slowness, noise and silence. The design process was non-linear, continuously producing reiterative feedbacks between small and large scale, between plans and sectional developments, between concepts and working models.

SUNG HO HONG: New media such as games, the internet, DVD, and movies have emerged into our community. Conventionally, these media are considered commercial, passive and anti-social in nature. However, with a growing population utilizing the media by sharing and communicating about them with others, the media could also be considered institutional, active and social. Until now, this population set was hidden by the lack of a proper environment to display their energy by actively participating in society. This project was an attempt to provide a desirable spatial property and quality for the new media and, more importantly, for people through a revealing, interrupting, and compacting environment.
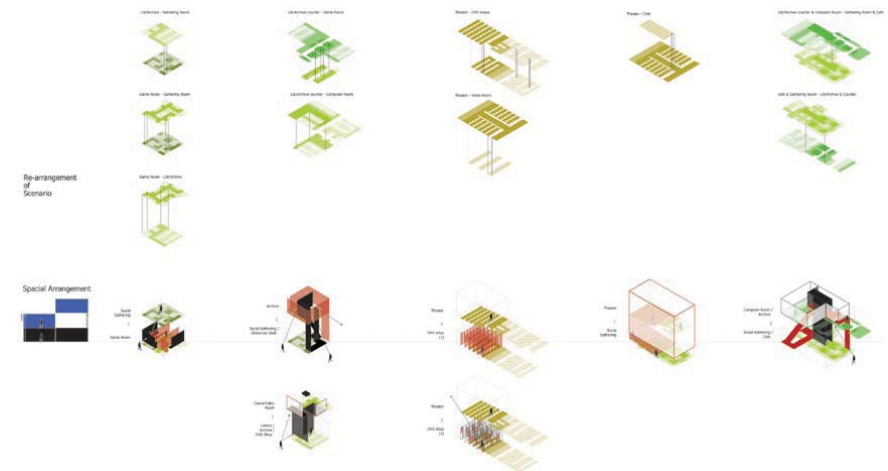
USONIA 06: EFFERVESCENT ENCOUNTERS BETWEEN ORGANIC HABITS AND EXTREME OCCASIONS
The house is an essential site of architecture. Not simply as a structure and a space to shelter and maintain the individual but also as a nucleus whose properties define wider patterns of development throughout the built environment. 'Usonia 06' was an occasion to examine the design of the contemporary American house in its internal make up and its external situation; in its architecture and its planning; its grouping generating their agglomeration in the landscape and relations with infrastructure or ex-urban public amenities. The research in this studio involves analysis and understanding of the make up and historical situation of two texts in their individual discourses – Frank Lloyd Wright's "Usonian House" and Inaki Abalos' "The Good Life." The project for the studio was the conjunction of the two bringing them to bear on the contemporary conditions of design for the domestic space. The brief and the methods employed for the development of the project involved interpretation of the ideas proposed by each text theoretically and in design, making a proposal for what was be a lively and challenging interpretation of problems around the architecture and development of grouping of ex-urban houses today.

NICHOLAS KOSTER AND ANGELA DERIGGI: Designed within the infrastructure of a mid-western interchange, this reinvention of the American suburb explores the contradiction of a house that seeks isolation while surrounded by the constant vortex of the highways. The primary architectural element of this Heideggerian paradox is the car—it creates both the most private space of inhabitation and access to the public realm.
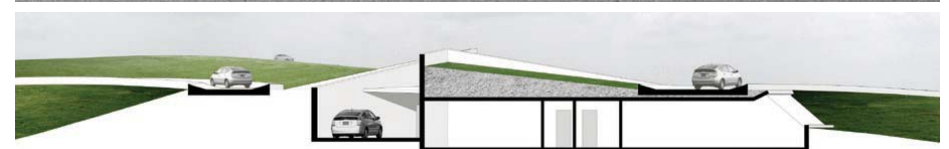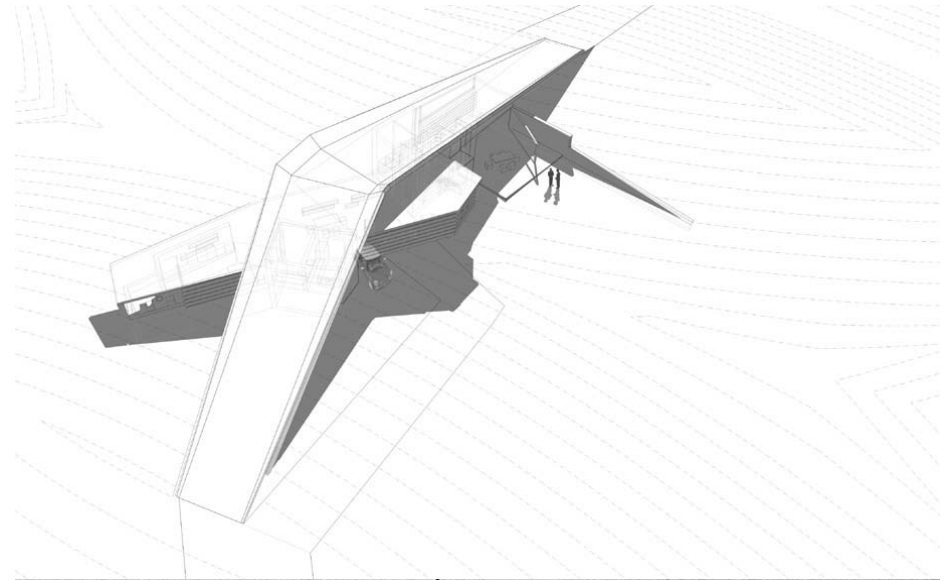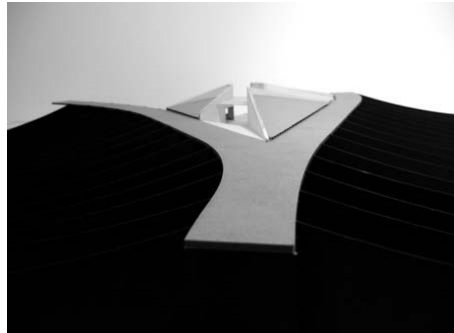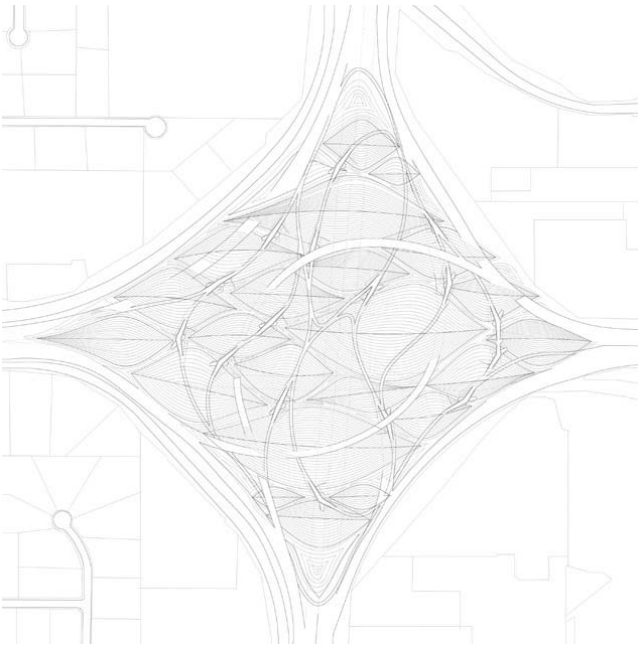
If you wish to change the outcome of what you make, you must change the process of how you make it. There is nothing we look forward to with such anticipation as the prospect of architecture catching up with the rest of the twentieth century. While buildings are still put together nail by nail on site, manufacturers of everything from toothbrushes to 747s explore new materials and methods of making. The prospect of mass customization, transfer technologies, and off-site fabrication should be givens for your questions in architecture, just as issues of structure, enclosure, and use have been givens for a thousand years. Your interpretation can be commonplace or exotic, local or global, detail-oriented or holistic, philosophical or physical; just about any approach is valid as long as the given topics are explored.

There were three parallel tracks to this studio: Short-term charette, ongoing research, and long-term design problem. The long-term problem of multi-unit new loft housing was the focus throughout the studio. The program for each unit of housing called for a kitchen, bathroom, and undefined loft space. This included all logistical arrangements of materials staging, the logistics of any crew and equipment needed, and hooking up utilities. Ongoing research projects operated around three topics: logistics, materials and fabrication. The final thread to the studio were charette-style design exercises using real materials aimed at the development of new building materials and assembly techniques.

CHRISTINA YARON: An u r b a n Loft: Philadelphia: Raw Unconventional Living
This exploration of the urban loft addresses the importance of the car in domesticity for American society, and attempts to pursue potentials of pre-fabrication and assembly as design techniques. Each unit uses interconnected spacious volumes, creating potentials for the evolution of the living environment to accommodate changing needs of the inhabitant(s) through time, while maintaining the raw, open flexibility inherent in loft reclamation of industrial space.

"...."
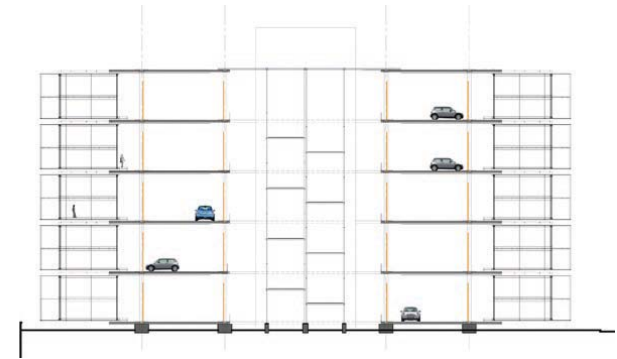
This studio was targeted by the hypothesis of transforming the "social contract" confronted to the mass media culture biotope and to define the morphologies of "....".

"...." is an unknown urbanism fragment described by the following text.

The research is to define the shape, the social organisation, even the smelling of "....".

I've heard about something called "....", something that builds up only through multiple, heterogeneous and contradictory scenarios, something that rejects even the idea of a possible prediction about its form of growth or future typology.

Something shapeless grafted onto existing tissue, something that needs no vanishing point to justify itself but instead welcomes a quivering existence immersed in a real-time vibratory state, here and now. Tangled, intertwined, it seems to be a city, or rather a fragment of a city.

Its inhabitants are immunized because they are both vectors and protectors of this complexity.

The multiplicity of its interwoven experiences and forms is matched by the apparent simplicity of its mechanisms.

The urban form no longer depends on the arbitrary decisions or control over its emergence exercised by a few, but rather the ensemble of its individual contingencies. It simultaneously subsumes premises, consequences and the ensemble of induced perturbations, in a ceaseless interaction. Its laws are consubstantial with the place itself, with no work of memory.

"...." also arises from anguishes and anxieties. It's not a shelter against threats or an insulated, isolated place, but remains open to all transactions. It is a zone of emancipation, produced so that we can keep the origins of its founding act eternally alive, so that we can always live with and re-experience that beginning.

Made of invaginations and knotted geometries, life forms are embedded within it. Its growth is artificial and synthetic, owing nothing to chaos and the formlessness of nature. It is based on very real processes that generate the raw materials and operating modes of its evolution.

The public sphere is everywhere, like a pulsating organism driven by postulates that are mutually contradictory and nonetheless true. The rumours and scenarios that carry the seeds of its future mutations negotiate with the vibratory time of new territories.

JESSICA H. BRAMS-MILLER: Taking inspiration from such diverse entities as weaverbird nests, scientific knot zoos, thorn bushes, and barbed wire, a module was devised that could be built and self-attached with the aid of a robot moving in a inward-outward spiral. Due to the connection capabilities of the module, varied spaces were created at the interior of the construct. Subsequently, colonization occurred by the inhabitant interacting heavily with the construct through acts of cutting and gathering. Spines of the "spiky worms" are removed or revised to pave a path through the construct by creation of ramps, stairs, and platforms. Subsequently, the question of sensations of "comfort" and "protection" in the home are raised due to the inherent violent qualities of the spiky module.
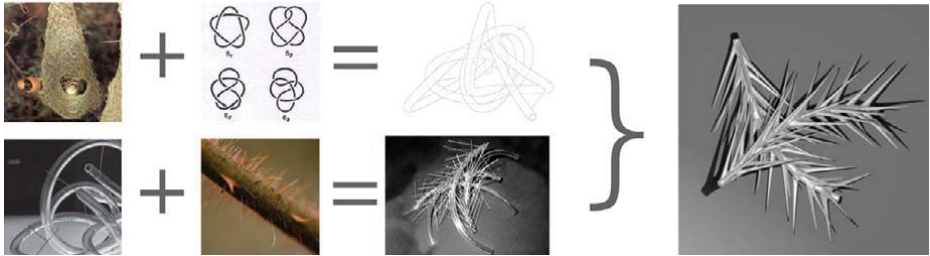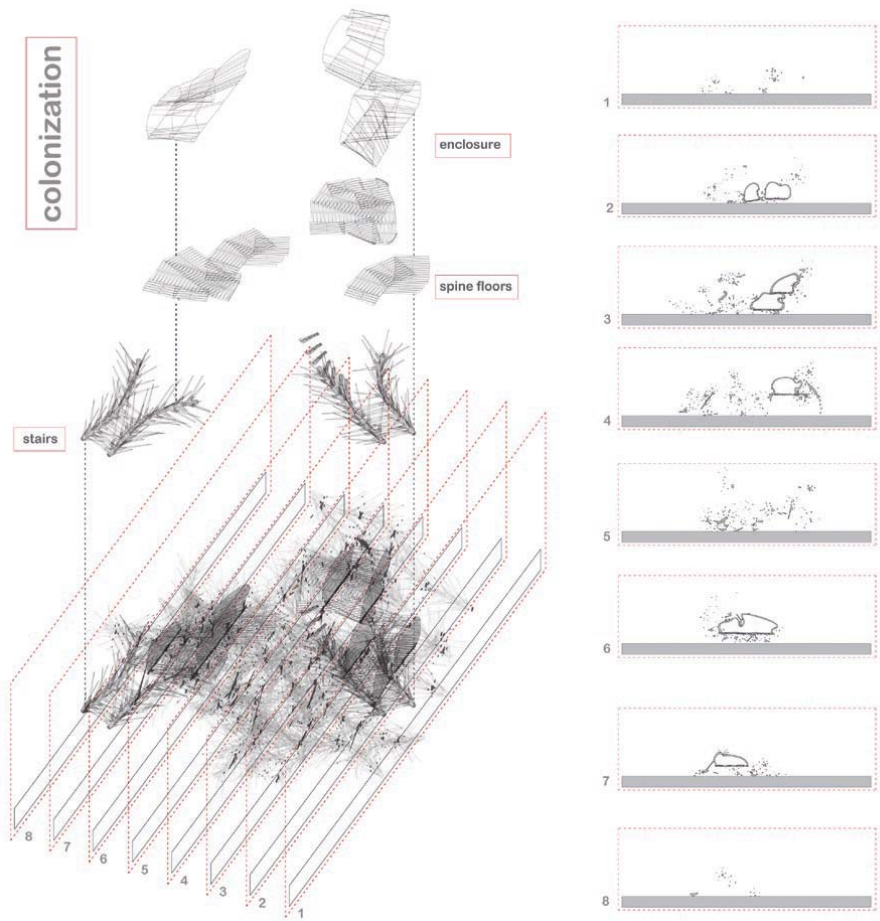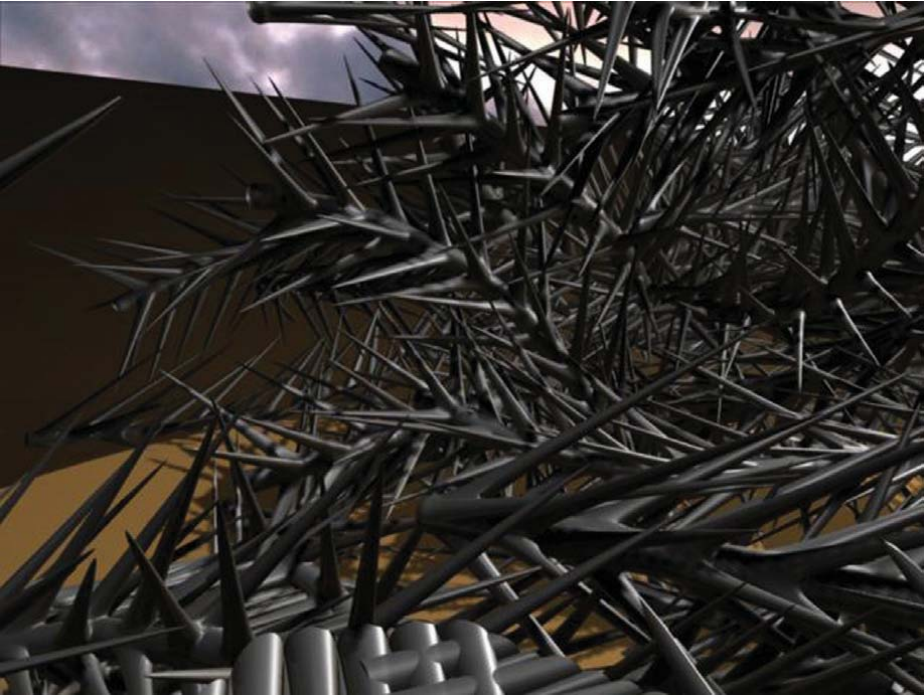
INSTRUMENTING A PLAN FOR COMPLEXITY: HOSPITAL-RIVER-CAMPUS-CITY

The spring 2006 studio sought to instrument a plan for complexity within the context of the development of the Penn Riverfront and the question: Can Architecture Heal? The intent was to promote the stable states of rejuvenation, wellness and healing through algorithmic modeling techniques that explore the unstable and the complex; relationships that oscillate, stimulate, provoke, transform, grow and adapt. A significant portion of the studio was devoted towards the translation and abstraction of complexity to built form. The instrumented plan focused within two buildings, a park and several interfacing paths of riverfront transit.

Our venue for deploying this plan for complexity was the yet-to-be-realized Penn Riverfront Development. This development will forge new connections between hospital, river, campus and city through defined locations of hybridized program. These charged locations will materialize themselves as layers of interfacing riverfront activity: a 4-story building that will serve as a live/work collaborative design center for recent graduates, a public park, a bridge, pedestrian pathways, cycling pathways and a restaurant/café.

FILTERGROUP: LUCIO BLANDINI, CHRIS JUNKIN, MIO WATANABE: This studio researched the potential of how the abstract diagram can inform new understandings of urbanism and connection. Using intuition as a guiding devise a synthetic relationship was explored between the organizational properties of abstract data and site specificities of context. In the production of relationships "tools" such as scripts were developed to design the movement between the different modes of working. Parallel processing, feedback loops, and research were encouraged to provide an environment in which non-linear relationships revealed to the imagination new possibilities of organization and systematicity.

The site is the city with a focus on the void between the campus of the University of Pennsylvania and the Schuylkill River. Program considerations, site specificities, circulatory conditions and emerging economies presented a complexity that was capitalized on as "urbanism."

This design group used the concept of the 'filter' to understand and translate phenomena at stages of the project. In the research and articulation of the abstract data a stance was taken on how it was imaged. This was informed by understandings of site and program and visa versa in a feedback loop in which there was never a specific moment of translation.

The project consists of pairs of folded plates which striate the site in specific ways establishing directional connections. The intersection points of the plates call out the programming of surfaces and an overall programmatic distribution based on organization. Correspondences between neighbor plates call out pathway connections which work with all the other elements in the design to establish part to part relationships indicative of a "body." What results is an exotic environment in which ambient effects are fully integrated with the overall behavior of the design.
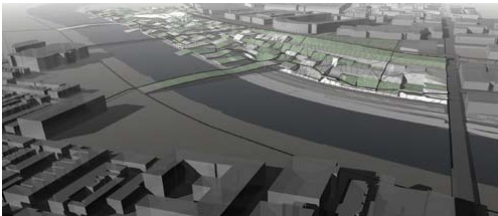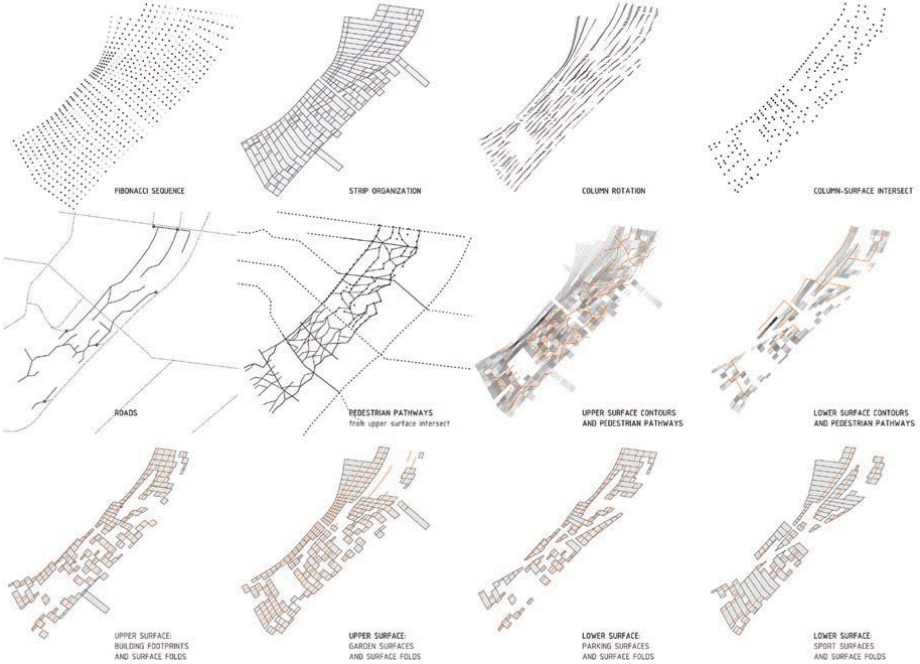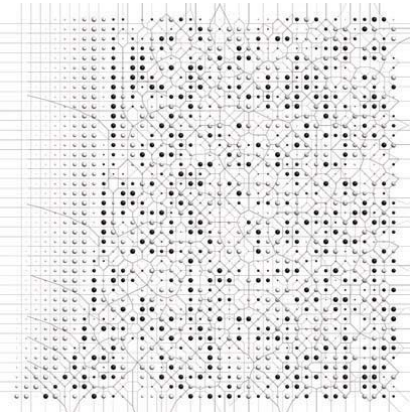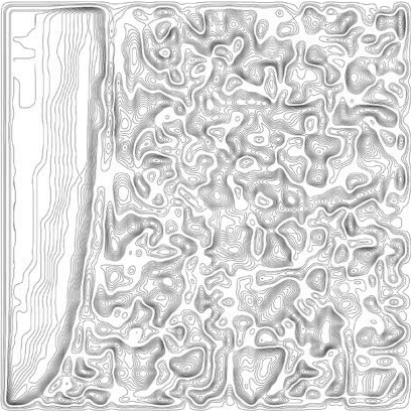
TransFORMations: EMERGENT ORGANIZATIONS FOR ARCHITECTURE
This research studio examined emergence and its relation to the formulation of architecture by utilizing dynamical systems in an opportunistic fashion for the generation of growth and evaluation of patterns in the development of form. This allowed the studio to deal with the full complexity of material systems that lead to effects that are greater than the sum of their parts. They are emergent. Emergent Organizations look for correspondence overlaps between locations, parities, and functions involved in their development. This process is reliant on a two-way transfer of information, which establishes the necessary precondition for positive feedback, and uses techniques and their ability to incorporate responsiveness, contingency, and the accidental in a generative process. The resulting temporally conditioned material arrangements are emergent organizations, which give primacy to formation over Gestalt, to dynamic multiplicity over finite totality. Dynamical systems circumvent pre-determined analytical processes that constitute figure/ground, ideal types and program and yield formations that are a gradient range between types, programs, and forms.

BORA TEMELKURAN: Transformations of modules in kind and type give gradient of spatial possibilities. Different features obtained by the accumulation of the modules at different phases of the transformation bring out and maximize affordances. Through various digital techniques, different emergent properties are researched on and further refined by continuous iterations to achieve unprecedented conditions of performance.

ARCH 706
DESIGN STUDIO VI / INDEPENDENT THESIS / ANNETTE FIERRO, COORDINATOR
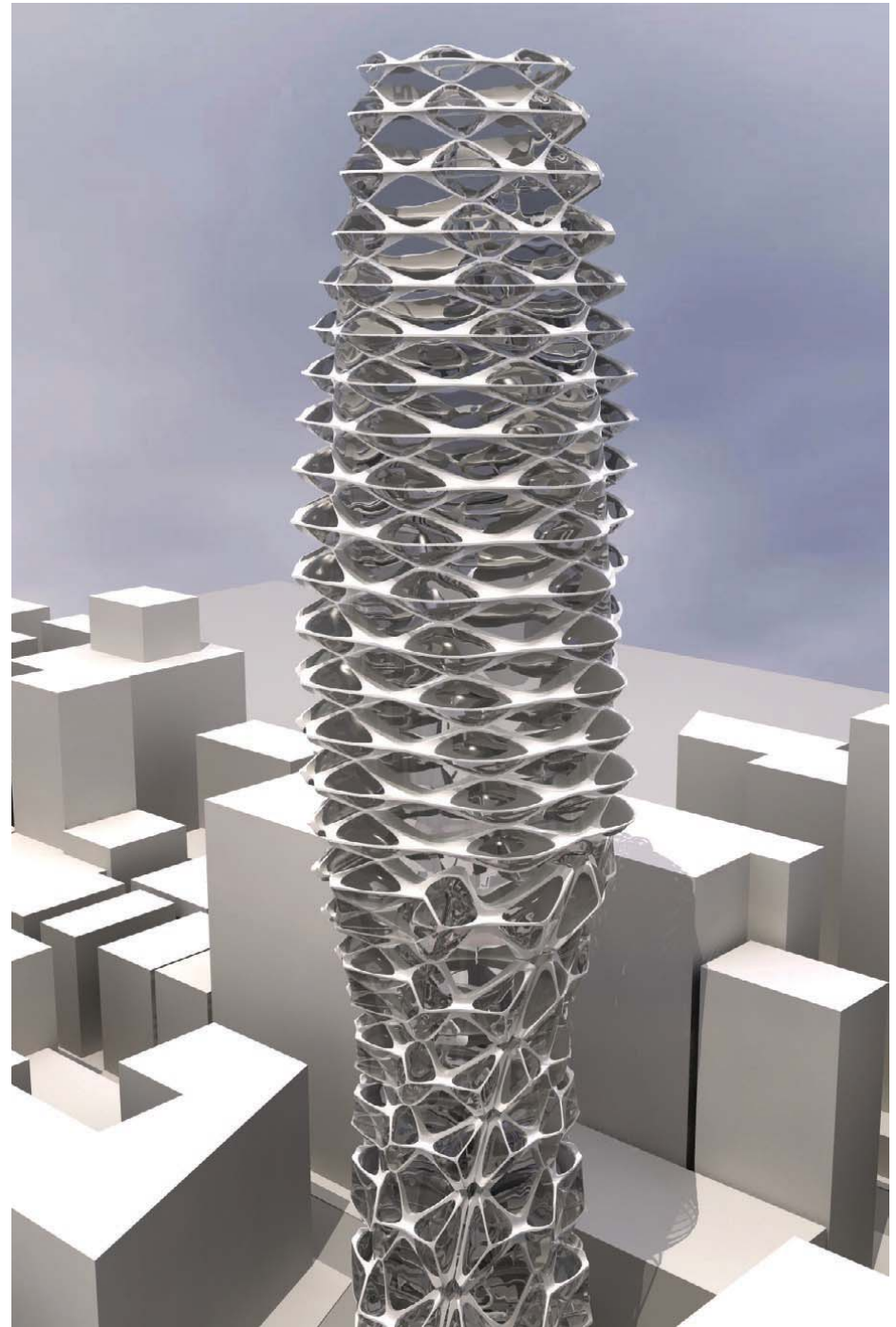
In their final semester, students may elect to do an Independent Thesis rather than an ARCH 704 Research Studio, subject to approval by the Thesis Committee.
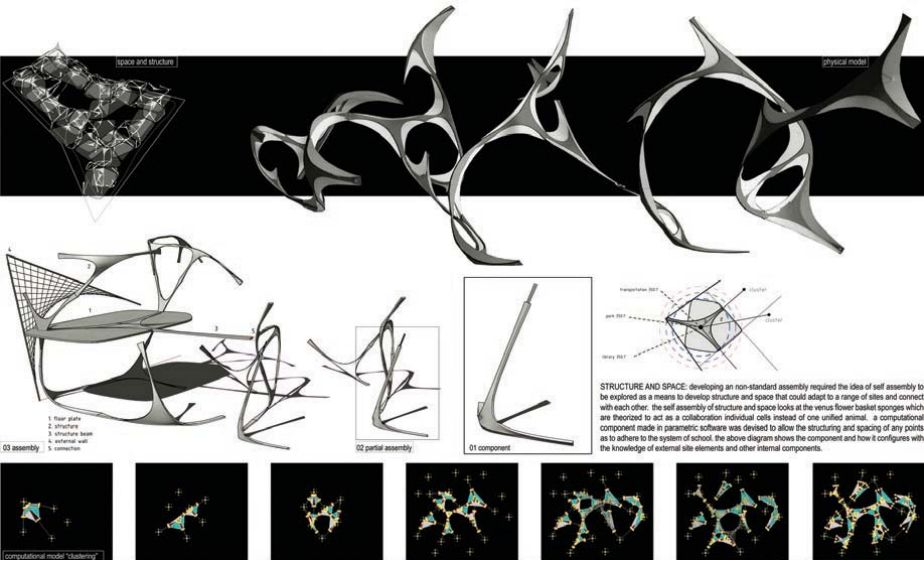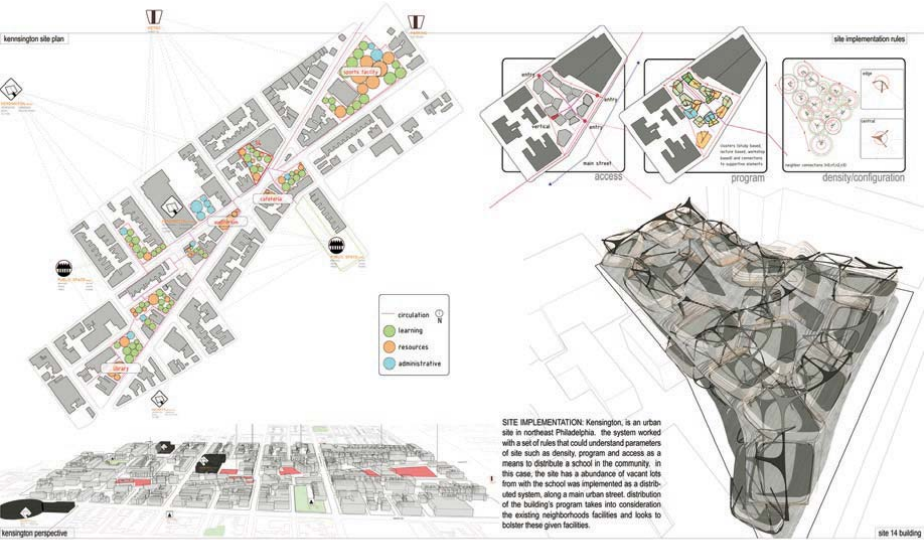
STEVE PITMAN: _LEARNING.PATTERNS: The attempt of this thesis is to use the idea of "learning patterns" to describe a set of design logics that embed schools within their respective communities at the urban scale, while reconfiguring the basic programmatic components of the school into clusters and aggregations that benefit the learner at the human scale. "Learning patterns" evolved from the ideas of Christopher Alexander and software engineers, and refers to "patterns as a solution to a problem in context." It represents a scale-less complex adaptive system that constantly negotiates between an internal and external set of rules for organization and self-configuration. As a proactive piece of public infrastructure, the school is an institution that could benefit from this type of intelligent system; that is, one which might interface between its internal logics and its environment.
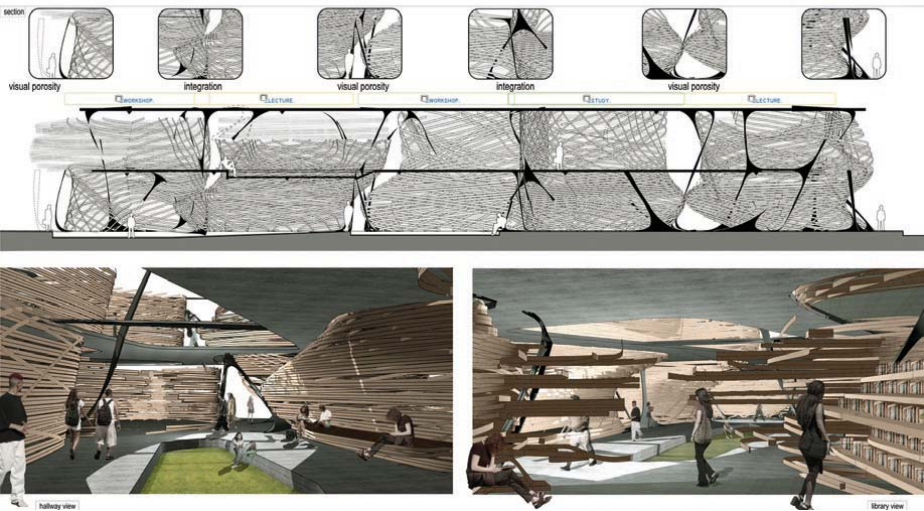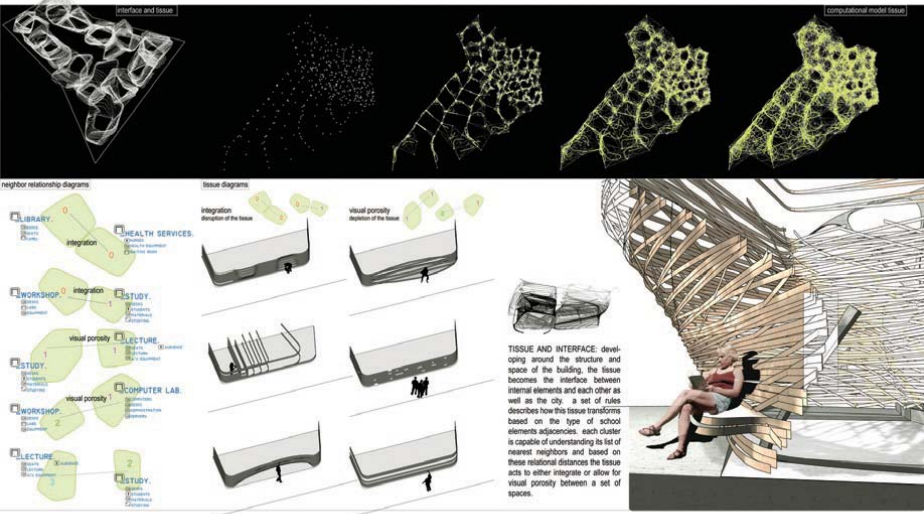
COURSES / REQUIRED

ARCH 511 History and Theory I, Detlef Mertins

This course re-examined fundamental conceptions of form, space, and material constructs in architecture by tracing the prehistory of contemporary preoccupations with generative processes and techniques. Typically, this preoccupation favors creativity, invention, transformation and evolution over representation and the reiteration of already given forms, norms, or styles. It is guided by theories of difference and event and privileges geometry, abstraction, diagrams, algorithms and codes for the production of new and unique entities. Historical accounts of theories of immanence, self-generation, creativity and constructivism - in philosophy, science, art, and architecture - provided a framework for re-reading the history of Western architecture over the past three hundred years. The course explored a host of unresolved binary oppositions with this history – between immediacy and mediation, immanence and transcendence, continuity and change, culture and nature, purity and hybridity, homogeneity and heterogeneity, aesthetics and politics. Guest lectures were given by Cecil Balmond and Ben Nicholson.

ARCH 512 History and Theory II, David Leatherbarrow

The aim of this course was to introduce some of the basic topics of architectural order and the typical situations in which they occur. The course structure and its arguments rest on two premises: one, that these topics, this order, and these situations have been developed historically, and two, that architectural order cannot be understood without seeing the building in relation to a wider horizon of reference - the city. While these premises give orientation to both this course and architectural theory, they also bear on contemporary design, for it can be argued that the single most important challenge facing design today is to resume the battle for the city as the most effective and eloquent embodiment of contemporary culture.

ARCH 521 Visual Studies I, Cathrine Veikos (coordinator), Kristy Balliet, Gavin Riggall, Igor Siddiqui, Patrick Stinger

This was a half-credit course that supports ARCH 501 Architectural Design Studio with focused instruction on the modes, methods and techniques of architectural representation. The goal of the course was to develop keen analytical sensibilities, the synthetic understanding of space and a high level of precision and rigor in drawing. The aim was to promote invention, always present in shifts between drawing media, scale and systems of orthographic and perspectival projection, through work that visually manifests the active selection and hybridization of analog and digital techniques.

ARCH 522 Visual Studies II, Cathrine Veikos (coordinator), Mayva Marshall-Moreno, Jenny Sabin, Marcel Sanchez, Igor Siddiqui, Patrick Stinger

This was a half-credit course that enabled students to develop a three-dimensional spatial imagination and the architectural drawing skills that index spatial inquiry and allow for its two-dimensional representation. Through a series of exercises, the course, built on ARCH 521, introduced a methodology which interweaves salient skills from architectural drafting and rendering with digital 3D-modeling and rendering skills. The work involved a high degree of precision, logical rigor and innovation. Synthetic understanding of space in three dimensions and mastery of the skills required to both project and simulate these in two dimensions was the goal of the series of workshops. The course placed emphasis on the speculative nature of

drawings and their capacity to provoke the imagination and to communicate ideas and concepts. As such, the workshops were complementary to design studio work; the drawings produced transcended the problem of representation to become architectures in themselves. Our aim was to promote invention, thoughtful selection of techniques and their hybridization.

ARCH 5221 FINAL GRAPHICS WKSHP

PAUL KANGAS-MUELT 24/05/2007
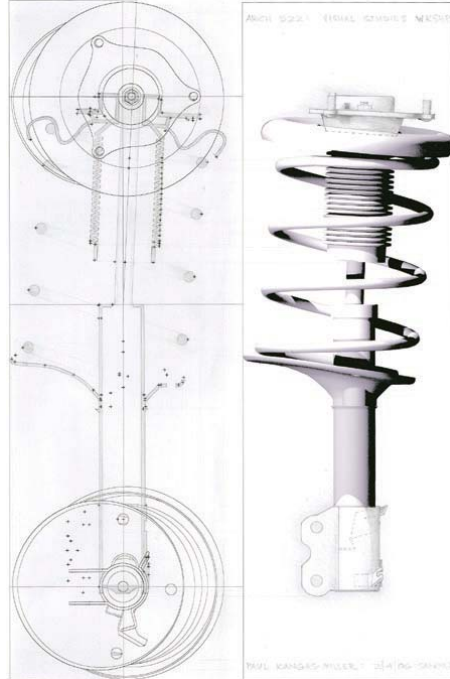
ARCH 531 Construction I, Laura Briggs

This course introduced students to the basic principles and concepts of architectural materials and technologies of fabrication and assembly. It described the interrelated nature of structure, construction and environmental systems.

ARCH 532 Construction II, Lindsay Falck

This course continued the introduction of materials and methods of construction begun in ARCH 531, focusing on light and heavy steel frame construction, concrete construction, light and heavyweight cladding systems and systems building.

ARCH 533 Environmental Systems I, Ali Malkawi

This course undertakes the study of human needs, comfort, performance, and sense of well being in relation to the physical environments both natural and man-made which occur in and around buildings. It introduces the mechanical systems in modern buildings with emphasis on tracing environmental, energy and waste problems that pertain to buildings. These

problems make it imperative that architects be familiar with the systems that affect building energy use. Students gain understanding of those elements of buildings that contribute to their heating and cooling loads and methods that reduce the energy consumption. Different methods of analysis, evaluation, and simulation were introduced and employed.

ARCH 534 Environmental Systems II, William W. Braham

In this course we considered the environmental systems of larger, more complex buildings. Contemporary buildings are characterized by the use of such systems - ventilating, heating, cooling, dehumidifying, lighting, communications and controls - that not only have their own demands, but dynamically interact with one another. The relationship to the classic architectural questions about building size and shape are even more complex. With the introduction of sophisticated feedback and control systems, architects are faced with conditions that are virtually animate and coextensive at many scales with the natural and manmade environments in which they are placed.
The first task of the course was to understand those systems and their purposes in simple linear forms through analysis and calculation. The second task was to examine their dynamic interaction with one another—between lighting, cooling, and building shape for example—and with the environmental conditions they are meant to ameliorate.
Coursework included the environmental analysis of a room in a building on the Penn campus. Such investigations involve measurements and performance simulations of environmental behavior and documentation of the HVAC systems of the building.

ARCH 535 Structures I, Richard Farley

This course provided a study of structural elements and their assembly into building structural systems, concentrating on design principles and structural behavior. The analysis and design of two-dimensional elements (flat and curved) and foundation systems were covered, as well as dynamics and composite elements. The course focused on observing and experiencing structural behavior, as well as the influence of the construction process on design of structures.

ARCH 536 Structures II, Richard Farley

This course is a continuation of the equilibrium analysis of structures covered in ARCH 535. Students studied static and hyper-static systems and design of their elements while learning to design for combined stresses and pre-stressing. The course focused on various structural elements, systems, materials and technical principals.

ARCH 611 History and Theory III: Architectures of Complexity, Helene Furján

This course examined the prevalence of complexity theory in architecture today: the near ubiquity of systems models, dynamics, genetic processes and emergence, networked organizations, digital fabrication and so on. Central to this investigation is the vital influence of "diagrammatic" practices and theories and techniques of nonlinear dynamic organizations, coupled with advanced mathematics and emerging technologies. At the basis of architectures of complexity lies systems theory: a relational understanding of the world opposed to earlier mechanistic and atomistic models that break the world into isolated parts. Systems theory thinks in terms of dynamic, self-creating and complex assemblies. Complex systems are redefining the way we understand material behaviors and structures, allowing material to be rethought as "matter." The genetic evolution of morphology—morphogenesis—is replacing more conventional notions of form and tectonics. Models of distributed, co-adaptive systems are shifting older notions of "sustainability" towards new formulations of ecology enmeshed with the theory of ecosystems. Field theories, coupled with models of network organizations, are changing the ways we view landscapes and the city, both manifestly and virtually. Space is redefined as an intelligent landscape of interaction and immersion; buildings as networked organizations, coupling infrastructural, structural, circulatory, programmatic, environmental, informational systems in tightly interconnected but distributed formations. "Design" is becoming "breeding," "operation" is becoming "performance." "Image" is giving way to "imaging" - branding, digital imaging, visualization techniques, and format - and towards mood, atmosphere, and immersion. Nevertheless, models of "systems" thought in architecture can be found as early as the Renaissance, if not before: the course thus tracked backwards from its basis in the present to locate the genealogical ancestry that prefigures much of today's preoccupations.

ARCH 621 Visual Studies III, Cathrine Veikos (coordinator), Andrea Flamenco, Raymond Kettner, Charles McGloughlin, Matthew Nowaczyk, Patrick Stinger, Roman Torres

The final set of Visual Studies workshops extended the trajectory of ARCH 521/522 further into digital media, supporting new design directions by actively identifying the salient strengths and limitations of digital techniques. A series of two-day sessions were held at critical points in the development of the studio project in ARCH 601, informing the studio work with digital techniques.
The sequence of exercises built on each other to nurture a synthetic understanding of space in three dimensions and a mastery of the skills required to both project and simulate its representation in two dimensions. Rather than limit it to topological surfaces or animation-driven investigations of complex forms, the drawings were seen as a performative locus: visual repositories of data from which information can be gleaned, geometries tested, refined and transmitted. Students were encouraged to experiment with media-specific techniques and create hybrids by alternating and combining virtual and material techniques.
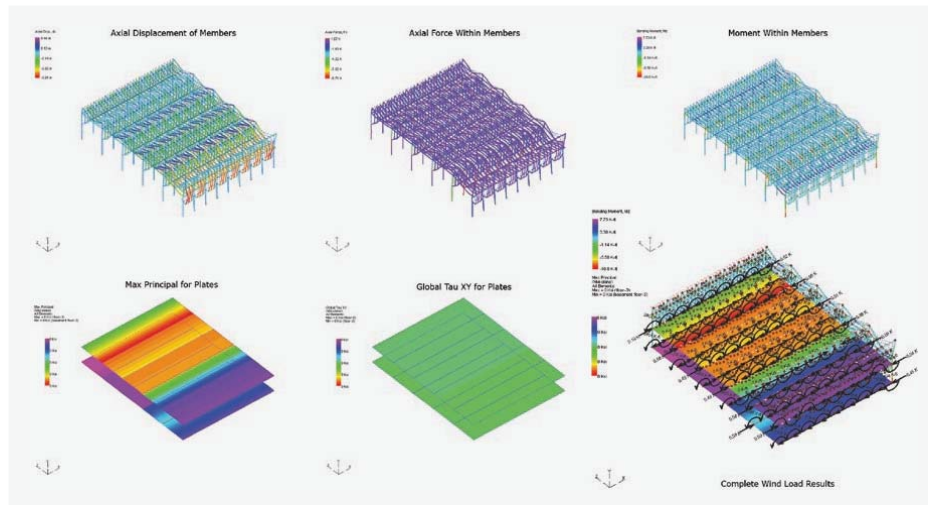
ARCH 631 Case Studies in Emerging Technology, Lindsay Falck

The course focused on current trends in technology being developed in the construction of buildings. In some cases, the emerging technologies involve new techniques for processing or assembling previously used materials, as with structural glass walls, whereas in others, totally new materials and processes of production are evolving, as with composite materials, such as carbon-fiber and resins formed and processed in autoclaved molds. The ultra-high strengths of alloys of ferrous materials are other examples of these new developments. The course also examined the rapidly changing methods of fabrication and on-site assembly of construction components, as in the CAD/CAM processes.
These emerging technologies relate to structural components, enclosure components for roofs and walls, service and environmental control components and to the processes of fabrication and on-site assembly techniques. Emphasis in the case studies presented by visiting lecturers and faculty was on the holistic nature of the design and construction process. This extended into the assignments undertaken by students in their analysis of a selected project, where all phases of design and buildings are studied.

ARCH 632-001 Space and Structure, Peter McCleary

This is an advanced course in structures that shows the duality between structural configurations and geometric space. The hypothesis is that there is a logical continuum from architectural space through geometric space to structural systems and materials. A scientific classification of structural systems is derived from their axes of restraint, degrees of freedom, dimensionality and geometry of curvature. A logical development is shown from compressive systems of stone, brick, and cast iron, through flexural systems in wood, steel and reinforced and pre-stressed concrete, to tensile systems of planar fabrics and linear cable-nets. Recent experiments in new materials and structural configurations are discussed.
A humanities classification of architectural spatial types derived from writings on theories of architecture included theories of the

cave, hut, and tent; Classical, Modernist, Raumplan, Constructivist, De-constructivist, smooth and striated, and "complex."
A synthesis that shows the continuum and the duality will relate a vector analysis (direction, orientation and magnitude) of the isotropy (directionality of activities) of space to the rheology (or flow) of force and strength of materials. The synthesis will attempt to integrate the weave of space with the warp and weft of the structural system and materials.

ARCH 632-002 Simulation and Design, Ali Malkawi

Simulation is the process of making a simplified model of some complex system and using it to predict the behavior of the original system. During the past decade, advancements in computer technology made it possible for building simulation to be part of the design process. This course provided students with an understanding of building design simulation methods, hands-on experience in using computer simulation models and exploration of the technologies, underlying principles, and potential applications of virtual environments (virtual reality) as a simulation tool in architecture. State-of-the-art computer models for thermal, lighting and acoustic analysis were introduced while the application of these models in architectural design were explored. A building was analyzed throughout the semester in the following areas: climate and site analysis; energy and passive solar systems; lighting and daylighting systems; acoustic systems; virtual visualization and design integration.

ARCH 632-003 Surface—Effects, Cathrine Veikos

The subtle and dynamic effects of the building surfaces of recent works by architects James Carpenter, Jun Aoki, Kenzo Kuma, Sejima + Nishizawa/SANAA, and Herzog and de Meuron are achieved through well-orchestrated details grounded in built reality. The perceptual effects of a building surface as a whole are directly related to the design of its elements of construction, its specific material and tectonic assemblies. Initial research by students will identify and examine the possibilities for organizing and structuring perception through the design of

surfaces. Lecturers demonstrated a range of effects created by selected architects and installation artists and examined how these effects are produced. The seminar was conducted as a workshop where students developed digital and material models towards the design of their own dynamic, environmentally responsive, surfaces. These proposals were reviewed and discussed with a series of design consultants. Recent advances in the design and fabrication of unitized curtain wall systems were the foreground for these discussions.

ARCH 632-004 Structure and Materials, Peter McCleary

Each material has a rheology (a pattern of flow, in time, under physical force) and an isotropy (directional resistance to deformation, resulting from its formation). Each material has a concomitant set of structural configurations. Masonry (natural or cast stone, brick) "wants to be an arch" (Kahn), vault, dome, pier or column. The cave is compressive. Wood, structural steel, reinforced concrete form braced frameworks (truss or frame). The hut is flexural. Steel cables and textiles form anticlastic nets and fabrics. The tent is tensile. Similarly the spaces of human activities have flow, direction and orientation. The building process of manufacture, fabrication and assembly engage men and equipment to move material through space in time. They are directional, oriented and define, paradoxically, a physical isotropy in space. This metric or rhythm to the system articulates a poetic rheology of construction.
This course examines, by means of a number of case studies, the correlations between building materials and their concomitant structural systems, and the changes that need to take place in the structural system as new materials are introduced.
The parallel course, "Space and Structure" examines that part of the continuum that shows the relationship between spatial intentions and structural innovations. The "core idea" is that material, structure, construction, and space form a continuum.

ARCH 638-001 Building Acoustics, Neill Woodger

This course began with an introduction to the fundamentals of acoustics including sound propagation, sound representation and measurement, sound transmission and associated materials, sound absorption and related materials, and reverberation time. After covering these fundamentals, the course covered the history of the development of performance space, principles of acoustic design of theatres, opera houses and concert halls. The implications of currently developing construction technologies, materials and design methodologies for the future of architectural practice relative to acoustic design were considered.

ARCH 638-002 High-Performance Building Envelopes, Alberto Cavallero

Last century's advances in digital representation, analytical techniques, systems engineering, mass manufacturing and mechanized construction have given us an unprecedented freedom in the technical feasibility of building. Yet along with this surge in ability we have developed an additional set of requirements for our buildings under the heading of "performance." Nowhere is this more clearly visible and critical than in the design of a building's external enclosure. We have succeeded in building walls that are increasingly transparent and ethereal, and simultaneously more resistant to wind and rain than their brick and stone predecessors. Now that "high-tech" is no longer new, we are entering an era where we expect still more of building technologies. Rather than being satisfied with simply the appearance of technology, we continue to demand more from

the actual performance of buildings, expecting them to improve the interior experience, to use natural resources judiciously, to tread lightly on the environment, and perhaps some day to produce more energy than they consume. Conversely, from an aesthetic point of view, we may become more sophisticated in our expectations for the experiential quality of these buildings, learning to understand glass and other materials as more than simply transparent and shiny.
This course focused on the parameters guiding the design, analysis and construction of high-performance building enclosures. A heuristic methodology formed the core of the course: by designing a portion of a wall for an actual project for the FDA, we studied the entire process of realizing a sophisticated enclosure. The result is both experimental and believable.

ARCH 638-003 Building Systems Integration, Richard Farley

The course examined various building systems from air distribution to voice and data systems and their effect on architectural design. Building Systems Engineers presented design principles using case studies of high-rise construction, mid-rise and small-scale projects. The course also focused on high-tech buildings and the implications of sustainable design. Tall building provided the context for discussing the special considerations that height and volume introduce to a functioning modern building. Mid-rise commercial and institutional buildings facilitated the consideration of state-of-the-art application of mechanical, plumbing, electrical, telecommunications and data, fire protection, fire alarm and instrumentation controls systems. Laboratories and technology buildings were used as examples of advanced intelligent buildings that contain controlled and sensitive environments. Tailoring and optimizing the various approaches were considered around the issues of smaller scale projects.

ARCH 638-004 Daylight, William W. Braham

Nearly everyone prefers to live or work in natural daylight. This is not just a visual preference, but a deeply biological condition, lodged in the most primitive parts of our brains and interrupted only recently with the introduction of readily available and controllable electric sources of light. Our most basic patterns of waking, eating, working, and sleeping are still bound to the rhythm of daylight—to "times of day"—even as we violate those patterns with artificial light and organic stimulants. Designing with daylight inexorably leads beyond matters of efficiency to fundamental questions about environmental quality.
Daylighting has been described as the "cornerstone" technique for the ecological design of highly-conditioned buildings. It produces at least two kinds of energy efficiency (lighting and cooling) and leads to a better, more convivial interior environment. The successful design of daylit buildings is also wholly bound up with basic architectural topics, with the size and shape of buildings, with the design and performance of the building skin and its apertures, and with the buildings responsiveness to the differing and changing needs of its occupants.
Architectural daylighting is often taught only in terms of utility and using minimum performance criteria. But daylight and sunlight are dramatically dynamic and changeable, altering position, intensity, and quality through the day and year. Successful daylighting design begins by understanding the specific dynamic qualities of the different kinds and orientations of architectural apertures, of how and when different openings gather light and of how and when they must alter their characteristics to exclude light. The techniques of daylighting range from the microscopic properties of glazing materials to the relative geometry of windows, buildings, and their surroundings.

COURSES / REQUIRED

ARCH 671 Professional Practice I, Harris Steinberg

This was the first of a two-semester workshop that familiarizes students with the organizational, institutional and legal contexts for practice. It opened doors for students through ties to leading practitioners and encouraged critical reflection on the nature of architecture practices today. This initial workshop focused on the organizational design of a range of contemporary practices. Students developed an understanding of the logics of practice by visiting four architectural offices during the semester, from small to corporate firms, specialized to international practices.

ARCH 672 Professional Practice II, Harris Steinberg

This course was the second workshop on professional practice that addresses the organizational, institutional and legal context of architectural practice. It studied the building process from the viewpoint of the different participants. Students developed appreciation and understanding of the importance of the relationships between the key "players" in the building process by visiting architects, developers, clients, contractors and fabricators in their place of work. They explored the different roles of these players and asked how each figures into the building process as a whole. We examined the goals of the architect and ask if they, at times, conflict with those of the other members of the team.

ARCH 772 Professional Practice III, David McHenry

This course, the third in a sequence in professional practice and procedures, focused on the nature of projects in the context of activities within an architect's practice and on the idiosyncrasies of managing multiple projects. Detailed studies of the legal, financial, marketing, management and administration issues associated with the different forms of office proprietorship were studied. The special set of contractual and ethical obligations of the architect, particularly in response to client needs and safety, were examined. Codes, standards and regulations and their relationship to the different activities in the practice of architecture were presented.

ARCH 811 Advanced Theory I: Architecture Shows What the City Gives, David Leatherbarrow

This course provides students who are embarking on career of scholarship in architecture a first introduction to some of the principle issues and writings of the tradition, spanning the time of Alberti to Rossi, reading both primary and secondary texts. In addition to introducing these themes and texts, this course also aims to help students develop the practices that are typical of scholarly inquiry. To limit, somewhat, the abundance of thematic and historiographic material that could be covered, the course also had a topical focus, signified by its title: Architecture Shows What the City Gives, referring first to the problem of representation (showing), and second to what might be called the urban donation: the capacity of cities (their 'given conditions') to provide a framework for architectural definition and meaning. Part of the course's aim was to consider the potentials for conflict and agreement between these concerns, how the realities of the second call for reconsideration of the first.
Each week the three hour meeting time into two parts: first, a presentation by one of the students on the week's topic and readings, and second, a concluding presentation by the professor, highlighting some aspects of the theme and introducing others that may have been overlooked. Each of these presentations was followed by a discussion. All

participants prepare for the meetings by reading the texts that are listed on the reading list, and considering the relevant buildings, drawings, gardens, cities, paintings, etc.

ARCH 812 Advanced Theory II: Readings on Generative Design in Architecture, Detlef Mertins

This course explored how generative design ideas and practices have been articulated by designers as well as several artists and historians. Each week we considered a different figure or set of figures around a theme. During the seminar, students were responsible for presenting the readings, followed by responses by the instructor and guests, and a general discussion. We undertook close readings of texts and examined their relationship to the design practices of their authors. In addition, we situated them in the history of architecture in general, and contextualized them in relation to scientific, philosophical, and engineering discourses. Guest interlocutors included William Braham, David Brownlee, Keller Easterling, Annette Fierro, Helene Furján, David Leatherbarrow, Jonathan Massey, Stanley Mathews, Peter McCleary, Inge Rocker, Ludovica Tramontin, and Tamar Zinguer.

COURSES / ELECTIVE

ARCH 711 Self-Organization and the Dynamics of Cities, Manuel De Landa

Cities are among the most complex artifacts arising from human activity. The process through which some cities (Versailles, Washington DC) emerged is largely planned down to the details of architectural style by a human bureaucracy. Other cities, such as Venice and its labyrinthine system of streets, emerged spontaneously without any central agency making the relevant decisions. But even those cities in which urban structure was the result of deliberate planning, have also experienced many bottom-up processes that, like Venice, represent the spontaneous emergence of order out of chaos. This seminar examined a variety of these processes, from markets to symbiotic nets of small producers, from epidemics of urban diseases to the creation of new languages and urban dialects. It also explored the interaction between self-organized phenomena and centrally controlled processes.
Through this course, students were able to gain understanding of theories of self-organization, including nonlinear dynamics, far-from-equilibrium thermodynamics and Artificial Life, considered in concert with new historical approaches to urban development, particularly those of Fernand Braudel, in which the physical and biological aspects of urban life are given as much attention as the social and linguistic ones.

ARCH 712-001 The Philosophy of Materials and Structures, Manuel De Landa

This course examined concepts in materials science, stressing not only the usefulness of this knowledge for the purposes of design but also its intrinsic interest as a basis for a technically sound philosophy of matter. The course was shaped by the belief that architects benefit from a more detailed philosophical knowledge of the theoretical principles behind structural engineering. At the same time, it was informed by the idea that the creative use of computer software and digital simulations would benefit from additional philosophical resources. Specifically, the course highlighted new software that simulates biological evolution (so-called 'genetic algorithms' that may be used to 'breed' new architectural designs) and illustrates its value in the practice of engineering. The course integrated insights from two different areas crucial to contemporary design: material science and engineering, on the one hand, and computer simulations involving a host of new 'virtual materials' such as NURBS surfaces, particles and metaballs, as well as the intersection of these with the new evolutionary software.
The lectures began with an introduction to the theory of the genesis of material form elaborated by the French philosopher Gilles Deleuze and continued with a history of material science, a discussion of scale and in particular the issue of cracks, an overview of metallurgy and fracture dynamics, the mathematics of structure, and the consequences of nanotechnology. The concluding lectures addressed the materials revolution, organic materials, the mathematics of structure, and the technologies and concepts underlying virtual materials and ultimately virtual reality.

ARCH 712-002 Meaning and Modes of Architectural Representation, Dalibor Veseley

Most of the questions facing architecture today are linked with the problem of representation. This is clearly apparent in the growing preoccupation with the new possibilities of digital representations and virtual realities. However these new possibilities are only a more radical stage in the development of a problem that belongs to the very essence of architecture no only today, but also in the past. This course addressed the

changing nature and meaning of representation in the stage of design, in relation to the physiognomy of buildings and in relation to the possibilities and limits of drawings, models and digital representation. All these issues were discussed in contemporary and historical contexts.

ARCH 712-003 Balkanization: From Metaphors of War to Architectural Strategy, Srdjan Jovanovic-Weiss

The seminar was divided in three parts. The first part looked at the current discourse about the territorial effects of the wars in the Balkans and effects on philosophical and cultural reactions throughout the region. It was imperative to find direct relationships between mappings of separated entities to inner divisions of political entities unwilling to fragment. In addition, relationships between hostilities and land division were considered, as well as conditions of contemporary political or racial separatism. An important part of this phase was to look at emerging positive aspects of Balkanization. Balkanization in the region of the Balkans was observed as a source for speedy evolution of the negative term towards positive positions of particular spatial sustenance.
The second part of the seminar examined contemporary occurrences of Balkanization occurring outside of the territory of the Balkans. It encompassed new critical views of the European Union and its processes of internal fragmentation while enlarging its outer scope.
The third part examined theory and strategies which emerged as a response to processes of confliction, territorial and spatial fragmentation. Writings of Julia Kristeva, Slavoj Zizek, Rastko Mocnik, Maria Todorova and Elizabeth Grosz on the emerging realms of the "outside," "strangers," "creative borders" were compared to more pragmatic approaches in avant-garde art and architecture. The aim of this segment was to learn from both theoretical and pragmatic sources, seemingly developed on two parallel tracks.
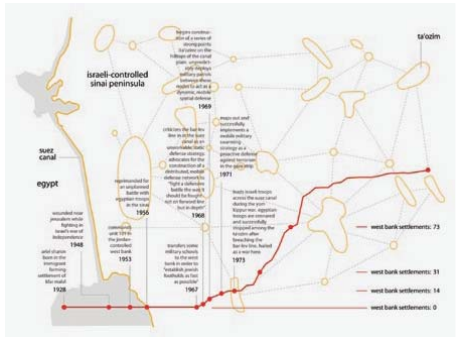
ARCH 713 Form and Algorithm, Cecil Balmond with Daniel Bosia

This is a course on the philosophy and generative tools of Informal design, which is defined in terms of non-Cartesian, non-linear geometries and adapts algorithmic procedures from models in mathematics and the physical sciences.
The course examines examples of non-Cartesian, non-linear geometries and forms, from their inception and conceptualization to their realization in the form of space, program, circulation and structure. It shows new forms

of Structure in its organizational and physical sense, demonstrating how these can be universal models operating at various scales and levels in the built environments. It illustrates the power of numbers and number systems as means of generating form and structure based on a new Informal logic. It demonstrates how the logics of movements, both found and invented, can inform generative processes from the representational to the constructive. And it demonstrates how new geometries and forms are generated through the use of tools ("tooling"), how these tools are live instruments of design, but also means for visualizing and understanding and extending mathematical systems and algorithms.

ARCH 715 Frank Lloyd Wright and the Disappearing City, Witold Rybczynski

Between 1922, when he established himself in Los Angeles, America's premier automobile city, and his death in 1959, Frank Lloyd Wright developed a consistent and complex vision of the future of American urbanism. The best-known expression of this vision was Broadacre City, his idealized urban proposal, but he also wrote several polemical books, gave lectures, published magazine articles, produced a number of master plans, and built a series of "Usonian" houses. Although Wright's decentralized version of urbanism was the consuming work of the long, mature phase of his career, it has been largely ignored, or regarded as a misguided folly. Yet, low-density suburbanization has become the preferred and dominant form of American urbanization, precisely as Wright foresaw. It would be useful to reexamine Wright's ideas afresh, not as the idiosyncratic foible of an erratic genius, but as a remarkably prescient analysis of American culture and urbanism. The seminar explored the architectural and urban design implications of Wright's vision, in the light of present-day developments.
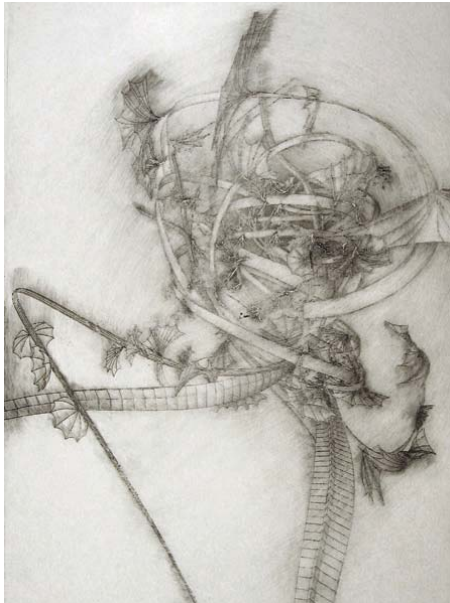
ARCH 722-001 Advanced Drawing Procedures Concerning Plastic Geometry, Rhett Russo

Architectural drawing, as it has existed for the last 500 years, is on the verge of obsolescence in light of faster and more precise and customizable digital technologies. The premise of this course was not to preserve this practice but rather to pose alternative methods for drawing in light of new technologies and to revisit what the act of drawing makes 'possible'. Software development has benefited from the simulation of traditional painting and drawing techniques, but few developments have been made by incorporating digital fabrication tools into the field of analog drawing. Students in this course explored using the digital camera and laser etching processes, and expanded their capabilities for visualizing and delineating minute bodies. These devices were used to expand the traditional limits of detail and precision. Drawings were executed on archival clayboard and integrated airbrushing, glazing, scratching, ink wash, pencil work, in addition to raster and vector based digital etching. Additionally, 3d modeling and raster conversion were involved to insure rapid platform changes between digital and analog work. Emphasis was placed on non linear assemblages, and multi-scalar approaches that expand the plausible outcomes of nesting various types of geometry.

ARCH 722-002 Furniture Design, Andrew Jones

This course introduced furniture design concepts and strategies, and provided practical insights into the material manipulation and aesthetic experimentation that are the essential elements of furniture designing and making. Lectures and case studies helped students to learn from precedents and develop their own designs. Students were guided through a series of design exercises, culminating in the final project – a chair design fabricated in actual materials. Students learned about problems unique to furniture design such as scale, weight, cost and production. Students undertook five studio projects and one case study. The design processes used during the projects conveyed a sense of craft and precision. The final project focused on whether the project employs materials in making an appropriate structural chair design. Students were expected to consider carefully how the body is accommodated through heights, angles, and shaping.

ARCH 732 Building Systems Integration, Ali Malkawi

The interrelationships of environmental control systems were explored by means of building type studies. Innovative systems are emphasized. Projects such as residential, commercial, office and assembly buildings will be analyzed in detail. The students investigated the principles of "high performance" or "integrated" buildings and how to apply these principles in design. The relationship between energy conservation and the principles of initial building cost versus life cycle costs were also discussed. Innovative building materials such as high performance glazing and photovoltaic systems were studied.
The first part of the course analyzed the systems of several existing "high performance" buildings. This study was accompanied by lectures about typical system components and building skins. Visits to several buildings will help students understand the integration of these systems. The second part of the course was a study of a single building. The layout of this building was provided. The work began with a proposal for the building envelope and, based on this design and the functional needs in the building, the environmental control systems were developed and applied through simplified computational simulations.

ARCH 734 Architecture and Ecology, Muscoe Martin

Architecture is an inherently exploitive act – we take resources from the earth and produce waste and pollution to make buildings. The construction industry, for example, is one of the single largest producers of greenhouse gas emissions in the United States as well as in other industrialized economies. Over the past ten years a growing awareness of the negative environmental consequences of construction ahs led many designers to look for ways to change how we design and build in order to lessen these impacts. These efforts have produced a number of revised construction techniques, innovative design tools, new products and marketing strategies, and have begun to have a significant effect on the building industry. However, the mainstream design world, in the U.S., has been slow to incorporate these approaches into either architectural theory or practice. This course explored the evolving notion of "sustainability" as it relates to the practice of architecture. We discussed how concerns about energy conservation, resource efficiency, open space preservation and indoor environmental quality are affecting the design of buildings. We learned to track the ecological scale effects of architectural design decisions. We critically reviewed the currently accepted metrics of sustainability including the LEEED® Green Building Rating System, the Ecological Footprint and other indicators. We investigated the integral connections between urban design, landscape architecture and hydrological engineering and their impact on the environmental impact of development.

ARCH 735 Archigram and its Legacy: London, A Technotopia, Annette Fierro

Acknowledging the ubiquitous proliferation of "Hi-Tech" architecture in contemporary London, this research seminar examined the scope of technology as it emerges and re-emerges in the work of various architects currently dominating the city. This scope includes the last strains of post-war urbanism which spawned a legacy of radical architecture directly contributing to hi-tech architecture; a particular focus of the course was the contributing and contrasting influence provided by the counter-cultural groups of the 60's – Archigram, Superstudio, the Metabolists and others. Using the premise of Archigrams' ideas of infrastructure, both literal and of event, the course attempted to discover relational networks between works of the present day (Rogers, Foster, Grimshaw, etc.). As this work practices upon and within public space, an understanding of the contribution of technology to urban theatricality will evolve which is relevant to contemporary spheres of technological design practices.

ARCH 736 Material Ecologies, Jane Harrison

Inevitably digital modeling and fabrication techniques demand new approaches to material composition and the development and use of new hybrid, synthetic or composite materials. The course was organized around two paths of investigation, or two points of view, one oriented to questions of material ecology, the other to questions of material effect. Both paths began with the selection of a general material type; i.e. paper, wood, resin, mud, glass or metal. Students chose whether to investigate the material's 'ecology' - its capacity to act globally and produce complex dynamic effects or to explore the materials capacity for producing material and psycho-spatial effects locally. Collaborations between ecologists and effect producers were orchestrated in the second half of the semester to develop specific and detailed material prototypes which gain their authority from both their detailed resolution as material artifacts

and their and inventive intervention. The purpose of the course was to develop competence in inventive material design and to explore the digital, ecological and physical in the production of new material prototypes. These prototypes utilized and exploited the potential of recycled or recyclable products and demonstrate their capacity for realization in the near future. We developed criteria for discussing performative effects which are verifiable by sensing what the prototypes do and how they work in reality, virtual, augmented or actual, and are related to an extended field of affects and effects, many of which are non-visual or defy explanation using image based media.

ARCH 739 Building Pathology, Michael Henry

This course addressed the deterioration and failures of buildings and their component systems. It included the technical aspects of materials and building failures, as well as the social and economic forces that also affect the fate of a built environment. Students were exposed to the techniques and vocabulary of construction, building failure assessment, restoration processes, and the techniques and methods of monitoring and testing buildings. Case studies were reviewed. For all of these topics, the course explored the various ways buildings deteriorate and fail physically, and the techniques of measuring and monitoring buildings for the purpose of assessing or foreseeing these changes.

ARCH 741 Elegance in Architecture: Architecture and Digital Design, Ali Rahim

This seminar explored concepts and digital design techniques that produce elegant architectural form. As an initial provocation - elegant architectural designs intertwine complex information and material as an elegant algorithm that uses a small amount of intuitive code to great effect - a generative logic that exceeds the simplicity of the algorithm. In mathematics, elegance describes a theorem that is surprisingly simple yet effective and constructive. Elegant designs carry with them the quality of being comprised of particular features that constitute their form. Features may include the continuity of surface and structure, surface integrity–surface articulation (anti-smoothness in digital architecture), and surface definition integrating program, space and systems in one highly articulate form. There were three simultaneous trajectories that this seminar explored: digital design concepts including generative techniques, temporality, generative temporality, affects and effects, and elegant forms; design techniques that potentially yield elegant design proposals include dynamical systems– particle fields and fluid effects; and elegant effects on architectural form, an exploration of the formal ramifications of design techniques on organizational, programmatic, spatial and material arrangements in combination with their interaction with the subject.

ARCH 742 Protocols for Systemic Formats - Adaptive Computing Design, Anna Pla Catala

Cities, as dynamic urban milieus, are in constant evolution and transformation entangling multiple disciplines in their constitution from the urban to the single building scale. This course examined processes of serial typological proliferation, focusing on the interrelationship between architecture, urbanism, technology, economy and politics. The course is structured as an intensive Research Lab where students are expected to develop speculative strategies for new building prototypes able to be operative within the contemporary contingent forces that shape the city. The research sought to

make consistent use of 'Systemic Patterns' whose logic shall easily escape direct reference either to recognizable urban and architectural forms or to the traditional lexicon of urban/architectural design devices. The attempt is to invest the design process with the same instabilities that characterize the real evolution of metropolitan realities, thus learning to intervene in the urban field based on network modalities of information, knowledge and material flows. We focused on the engineering of a 'Systemic Format' understood as a set of protocols and operational devices able to deploy tactical behaviors in urban contingent conditions constituting themselves as 'active sites'. Making use of analytical and adaptive digital design tools we regulated relational fields of spatial occupation. Other varied and combined computational techniques will be also employed to abstractly manufacture systemic components as combinatorial parts to be applied when the opportunity arises, optimizing 'problematic' specificities within given environmental conditions [economic, political, material, geometrical]. Students were expected to work individually developing multiscalar prototypes according to codified behaviors, and also collectively, sharing a class database to construct an 'urban ecosystem' so as to articulate the relationship between the singular and the multiple. Each of the individual strategies work on a distinct and concrete environmental aspect, yet their interplay produces and potentiates a consistent synergia providing models for Systemic Formats for the 21st-century city.

ARCH 744 Digital Fabrication - Structural Patterns and Component Organization, Ferda Kolatan

This course used parametric software to model sets of structural components, which were linked together to form larger network systems. The relationship between the discreet (component) and the continuous (network) will be responsive and dynamic as both will be mutually dependant on each other's behavior. The resulting emergent patterns were then laser-cut and transformed into physical models and tested against constraints related to scale, structural performance and material effects. Insights won through the physical modeling output were filtered back to enhance the performance and adaptability of the digital model. The students learned to set up parametrically controlled models and investigate how to manipulate their behavior via local components and larger field formations to generate structural organizations of high complexity. In an organic transition from the digital to the physical, different laser-cutting techniques were explored and applied to generate intricate models that display specific material properties and characteristics. These models could then be evaluated and tested as architectural proto-structures ranging from small-scale interventions to large building systems.

ARCH 745 Information Culture, Dean DiSimone

The ubiquity and ease of publishing content on the web has helped define a culture, a culture that architects are engaging actively by leveraging unique ideas of inhabitation and experience through graphical and technical means. The online medium has borrowed from many analog precedents including graphic design, film and architecture, but finds its success in collapsing these models into a unique form of communication through experience in the evolving datascape. When this experience is coupled with theoretical and philosophical underpinnings, there exists the potential for an unprecedented medium of expression. The course identified and investigated different methods of structuring and dispersing information within networks, and explored the ways of using these methods to create a public forum. Discourse included parallels to urban

phenomena, biological and natural organizational paradigms, AI and bionomics. Case studies provided the material for this investigation; assignments, the opportunity to develop one's own statement. The course focused on two distinct components of our networked environment that comprise the way an interface is inhabited: navigation and spatialization. By focusing on these components, we attempted to undermine the linear performative nature that exists in the PUSH medium of today's internet and draw from our architectural ideas to create an unscripted experience. The exercises focused on developing a tool set to allow for the designer to create a public space, or 'polis', which extends the value of the internet as a communication and experiential tool.

ARCH 746 Generative Models, David Ruy

This seminar is structured as an intensive experiment into techniques associated with generative models of design. Students were asked to develop technical understanding as a springboard for difficult questions about emergence and organicism in architecture. Though the term 'generative model' is now commonly used to herald the provocative powers of digital design, its literal connotations are surprisingly esoteric and problematic. Life is generative. The claim that architecture can use a generative model implies that architecture itself has the capacity to be alive, autonomous, and have mind of its own. How is this possible? And why would computer technology enable a generative model? What is the relevance of a generative architecture in society today?
The seminar examined current lines of research investigating the becoming of architectural form, (morphogenesis, phylogenesis, dynamic systems modeling, parametrics, generative grammars, cellular automata). The speculative discussions in the weekly workshops focused on the motivations for these techniques to understand that the techniques are in service of a larger, unfinished cultural project.
The primary requirement of the seminar was the assembly of a physical model based on a generative principle to be defined by the individual student.
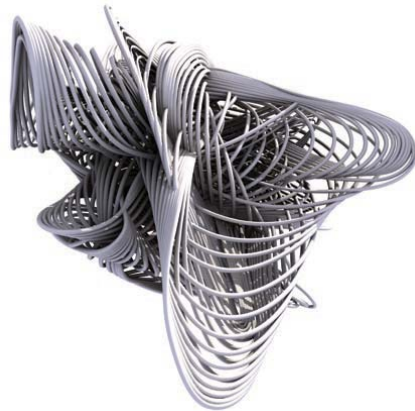
ARCH 752 Case Studies in Urban Design, Gary Hack

In this course, urban design is taken to mean a subset of projects that are designed to change the public realm of cities. Design is important as a way of framing the issues, examining

possible outcomes, and providing an agreed upon destination. However, urban design situations are usually characterized by multiple actors, lengthy times for implementation, objectives that shift over time and often indeterminate outcomes that must be reconsidered as events unfold. Ideas are the central currency of urban design. They need to be powerful and clear enough to capture the imagination of those who will lead the effort to implement them. The best urban design ideas can usually be conveyed through a small number of powerful images or metaphors that transcribe a plan into compelling need. This plan, and the ideas underlying it, must be context specific – one size does not fit all. Urban design involves several important habits of mind: thinking of the next larger context when conceiving of any action; considering how a place will be actively changed over time; recognizing the past history of a place, while designing for the future; and thinking strategically in terms sequencing. Considering the cases over the course of the semester, we looked for the ways that these attitudes are expressed through drawings, words, plans and images. This course was an opportunity to examine the many processes of design and implementation of complex urban development projects. Over the course of the semester, the class analyzed thirteen important examples of urban design, ranging from design of a small village to the largest most complex urban design plans in cities across the globe. Most cases were presented by the designer or developer responsible for the project.

ARCH 762 Design and Development, Witold Rybczynski

This course provided an introduction to the relationship between architectural design and real estate development. The examples discussed focus on buildings in which we live, work, and shop, and illustrate the important role that architectural design can play in real estate development. Topics included housing design, commercial buildings, adaptive reuse, downtown development, mixed-use projects, and planned communities.

ARCH 765 Project Management, Chip Arena

This course introduced students to techniques and tools of managing the design and construction of large and small construction projects. Topics included project delivery systems, management tools, cost-control and budgeting systems, and professional roles. Cost and schedule control systems were described and case studies illustrated the application of techniques in the field.

ARCH 768 Real Estate Development, Asuka Nakahara

Through this course, students may become better decision makers and real estate leaders, understand and assess the risks in real estate development and investments, be more productive in their first job, and familiarize themselves with the real estate development process. The course focused on "ground-up" investments. We examined the similarities and differences of traditional real estate product types including office, R&D, retail, warehouse, lodging, single family and multi-family residential, mixed use and land. We also analyzed "specialty" uses like entertainment, retail and golf course development, and relatively new concepts like New Urbanism and timeshares. Students learned the development process from market analysis, site acquisition, zoning, entitlements, approvals, site planning, building design, construction, financing, and leasing to ongoing management and disposition. Special topics, like workouts and running a development company, were discussed. Throughout

the course, we focused on risk management. In a business filled with uncertainties, minimizing risks results in maximizing long run profits.

ARCH 773 Structure and Meaning in Human Settlements, Tony Atkin

Exploring the common ground in architectural theories about place and dwelling, anthropological research in settlement archeology, and the study of cultural landscapes and geography, this course investigated the relationship between form, space, and meaning in human habitation across cultures and time. Readings by Rykwert, Pallasmaa, Sorkin, Leatherbarrow, Boyer, Blier, Fung, O'Connor, Laureano, Atkin, Olin, Cosgrove, Fehn Siza and Koolhaas among others examined the ordering principles and spatial typologies of ancient and contemporary settlements, and their meaning in relation to production, ideology and world view. Case studies included geomancy and divination as determinants of traditional settlements, symbolic and productive landscapes, and how settlement patterns and structures embody and interrelate with climate, environmental conditions, and social and cultural formation.

ARCH 780 Architecture in Education, William W. Braham

AIE is a 20+ year program of teaching architecture in Philadelphia area schools by the American Institute of Architects. As participants in the AIE Program, students have the opportunity to work directly with children in the classroom making an impact on their lives and on the future of our neighborhoods and cities. Students work with a classroom teacher and a design professional to develop a weekly series of eight (1 ½ hour) interdisciplinary experiential lessons using the built environment as a laboratory to create stimulating new ways of seeing, learning, and doing. Students participate in the course on a volunteer basis or may receive one half course unit of credit. For information about the program please visit the AIE web site http://www.aiaphila.org/.

ARCH 790 Architectural Culture, David Turnbull

This course examined the scope of research culture as it has developed in architecture over the past decade and as it evolves to address new conditions. The three themes that structure this course are: World_Cities, Building_Effects, and Mind_Bodies. These themes subtend from an economic and political discourse of globalization, and encompass the ecological imperative and opportunities related to the widespread use of digital media. This course opened with a trajectory charted by Joan Ockman and Michael Hays which starts in the mid-1940s, notably the Bretton Woods N.H conference of 1944 which established the IMF, World Bank and ultimately the WTO, the apocalyptic conclusion to the 1939 – 45 war in Europe and Asia, and the ensuing struggle to rebuild devastated cities. Hays' book ends in the early 1990s – where this course starts, with the release of Nelson Mandela, the collapse of the Soviet Union, the demolition of the Berlin Wall and - in the wake of a period of remarkable technological transformation - the proliferation of desktop computers, the catalytic invention of the world wide web (in 1991) by Tim Berners-Lee, and developments in mobile communications, the HIV/AIDS plague, ecological crisis, globalization and war. A different audience and different tools transform architectural speculation. In place of the reflexive and critical preoccupations of theory and its purposefully problematic relation to practice they propose practices of research, and of design as research.

DISSERTATIONS

Building A Modern Vision: Auguste Choisy's Graphic Constructs
Hilary Bryon; Supervisor, Joseph Rykwert

The illustrations created by the engineer Auguste Choisy for his principal work, the Histoire de l'architecture of 1899, express a deliberate correspondence between the mode of visual expression and the architectural idea of building. His novel development of the worm's-eye view axonometric merits scrutiny. This dissertation investigates Choisy's use of parallel projection in communicating not only his tectonic theory of architecture, but the ways in which this drawing form came to communicate uniquely the dynamic patterns characterizing nineteenth century French epistemological and architectural discourse. The intellectual content of Choisy's education, career, scholarship, and teaching of architecture while associated with the pre-eminent technical institutions, the Ecole Polytechnique and the Ecole des Ponts et Chaussées, are examined. The dissertation tracks the invention of axonometric projection, detailing its pragmatic genesis in 1820 as isometrical perspective in England to its ultimate theoretical refinements within the fields of mathematics and geometry in Germany and France. The study demarcates the spatial divide in parallel projection between the oblique cavalier perspective and orthogonal axonometric projection. It proceeds to analyze how Choisy used these forms of parallel projection and exploited the new rotational space of axonometry in his conception of the inside view to document the spatio-tectonic fundaments of vaulted structure in his first illustrated work in 1873, L'art de bâtir chez les Romains. The imagined worm's-eye view is explored as a critical device that equilibrates the geometric, homogenized object in parallel space via an inhabiting observer. Shifting the examination to the Histoire reveals an abundant use of cavalier perspectives and limited examples of axonometric perspectives; Choisy guides their inherent spatial differences toward divergent theoretical purposes. This dissertation concludes that Choisy's cavalier perspectives operate comparatively, ultimately structuring an iconic technique through which the built artifact becomes a theoretical proposition, and that axonometric projections idealize tectonic space, implicitly positing space as one of the necessary elements in the artful assemblage of architectural form.
Photo caption: Worm's-eye view, plan based, oblique projections convey the spatio-tectonic progression of Romanesque architecture.

Reconstructing the topographies of the modern city: the late CIAM debates
Marina Lathouri; Supervisor, David Leatherbarrow

The subject of this dissertation concerns the reorganization of the knowledge of the modern city that occurred in the mid-twentieth century. The emergence of the urban as an expanded field of architectural intervention as well as the increasing interest in the multiple relations between social patterns, territory and history threw open a discussion on the heritage of the modern movement and settled the grounds, upon which the rethinking of the city developed after World War II. The work is concerned to identify not a succession of concepts but the ways, in which earlier ideas and forms of spatial organization were transformed and absorbed into approaches shaped by the specific circumstances of the post-war reconstruction and the debates of the time. Sections through the CIAM (Congrès Internationaux d'Architeture Moderne), and in particular the congresses that took place between 1947 and 1959, are used as an analytic device rather than evidence. Themes, visual strategies and projects discussed in the post-war congresses convene a range of issues, which are contingently appropriate to describe conceptual reconfigurations of the modern city and their spatial, formal and historical implications.
The hypothesis is that a different understanding of architecture and the city began to emerge, one that absorbed or transformed previous suppositions and methods on at least two fronts. Firstly, the sense of a building, or a city, embodied in its three-dimensional geometry was gradually combined with the idea of an order that followed the dictates of social and environmental needs. Secondly, this manner of thinking that sought to inquire into and materialize the relations between the different parts of a broader system, underpinned the move from an absolute identity to a contextual identity. The thesis aims to delineate a process directly involved in shifting perspectives on the city, and thereby, acknowledge a continuing discourse on the urban and its intersection with architecture and spatial organization.

Architecture and the Marvelous: The Incorporation of the Marvelous in American Architecture from Monticello to Disneyland
R. Scott Miterko; Supervisor, David Leatherbarrow

Disneyland is an architectural marvel that can be understood and appreciated as part of the rich and broad history of the marvelous in architecture: A history of the marvelous in architecture that can be followed back historically to the first mention of The Seven Wonders of the Ancient World. As an American architectural marvel Disneyland is also unique and it stands apart from architectural marvels before it, particularly outside of modern America, while making a unique contribution to the marvels that have followed it, both in America and abroad. To understand Disneyland's unique and ultimately pivotal position as an architectural marvel, first, a broad, varied and significant history of the positive pursuit of the marvelous in architecture must be established. Next, the emergence and development of a unique strain of the marvelous in America, including the marvelous in American architecture, should be developed that is indebted to, but distinct from its European precedents. Finally, with a firm, significant, historical context established, the tentative emergence of the American marvelous in architecture at examples such as Monticello and the Columbian Exposition of 1893 will be shown to emerge in its fullest form, for the first time, at Disneyland in 1955. At Disneyland, the marvelous is fully secularized and incorporated by business in the making of a place where the pleasure of the consumption of the marvelous is paramount to the design and purpose of its architecture.

Thinking through Things: 12 y 14 de la Calle Ramirez. Tacubaya, Mexico City: Luis Barragán's Grounds
Carlos Eduardo Naranjo Quiceno; Supervisor, David Leatherbarrow

How do Architects contribute to the constitution of a cultural world? This is the question pursued throughout this dissertation. The argument proposed here is that architects contribute by thinking through things. Thinking through things is understood in two different but related ways. First, as the thematization of the conditions of reciprocity between the Human body and the world: the here of the body, the horizon and the strata of sense. And second, as the exploration of three fundamental architectural themes: being located, being contained and being accompanied. Arguing that each of these themes owes its origin to the thematization of one of the conditions of reciprocity: being located on the thematization of the here of the body, being contained on the thematization of the horizon and being accompanied on the thematization of the strata of sense.

This inquiry is directed by the descriptions and interpretations of the house the Mexican Architect Luis Barragán built for himself in Tacubaya, Mexico City.

DISSERTATIONS

Technically Symbolic: The Significance Of Schema And Claude Bragdon's Sinbad Drawings In The Frozen Fountain
Mary Nixon; Supervisor, David Leatherbarrow

In this dissertation I argue that Claude Fayette Bragdon (1866-1946) viewed schema as both technique and symbol and that he saw schemata as preeminent for the architect. Displacing the traditional approach to schematism as solely a systemized procedure, Bragdon assigned it representational meaning, the means to an instrumental and figurative end. "Schematic" is described by Bragdon as "a systematic disposition of parts according to some co-ordinating principle," as well as "belonging to the higher dimension of consciousness, the aesthetic quality, a spiritual essence, love manifesting as beautifulness."
He linked sign to technique, spirituality to instrumentality, and did so by appropriating fundamental, universal principles of design (harmony, balance, rhythm) and creating representational sites of signification for both beauty and necessity. For Bragdon, schematic techniques developed from regulating lines of linear grid units, elementary figures of geometry and the human figure, parallel diagonals and musical ratios, the logarithmic spiral, platonic solids, hypersolids and magic squares, raised architecture from "mere scene-designing" to the level of art. This thesis explores the importance of Bragdon's final book of architectural theory, The Frozen Fountain, Being Essays on Architecture and the Art of Design in Space, which has received scant attention by architects since its publication in 1932.
I demonstrate the relationships inherent in imagery and quests, the importance of the art of books and posters, the influence of orientalism and mathematics in the early 1900's, Bragdon's preference of point-of-view, and his belief in the first principles shared by all designers. Bragdon offered The Frozen Fountain as part manual and part missal of fundamental, universal truths for architects in a secular age. Although similar approaches to ordering and signification were used and described by architects such as Le Corbusier, Frank Lloyd Wright, and Louis Sullivan, it was Bragdon's reputation as a Theosophist and his advocacy of a four-dimensional theory of ornament, that doomed this project to neglect. Bragdon's final architectural work provides an unusual view of the quest to navigate the traditional divide of technique and symbol.

The Essence Of Architecture: August Schmarsow's Theory Of Space
Roy Malcolm Porter, Jr.; Supervisor, David Leatherbarrow

Few concepts more intrigued artistic imagination in the twentieth century than the notions of form and space. Yet the preoccupation with these phenomena did not occur suddenly, for architects, artists, historians, and philosophers had increasingly concerned themselves with their consideration during the last half of the nineteenth century and had produced an impressive body of literature devoted to these speculations. Chief among these contributions were the theories of the historian August Schmarsow. First voiced in his inaugural lecture, "Das Wesen der architektonischen Schöpfung" (The essence of architectural creation), his own speculation about spatiality as the essence of architecture culminated in its presentation in Grundbegriffe der Kunstwissenschaft am Übergang vom Altertum zum Mittelalter (Fundamental principles of the science of art at the transition from antiquity to the middle ages). Published in 1905, it followed closely the publication of Alois Riegl's treatise, Spätrömische Kunstindustrie (Late Roman art industry). Like that treatise, Grundbegriffe der Kunstwissenschaft reflected its author's conviction about the role of space and the significance of its expression in a particular period of history. Addressed as well were "the three principles of human organization"—symmetry, proportionality, and rhythm. Their formulation revealed his premises, which embraced the role of the psyche and accepted the attributes of the body in our perception of space. That encounter entailed an awareness of us as beings that inhabited space and of our existence within the cosmos. As the creation of architecture unfolded, we reminded ourselves to focus on its essential aspect—the creation of space which affirmed our humanity.

Architecture in the Manner of Giovanni battista Piranesi Ornamental Excess, and the Apotropaic Function of Grotesque Representations
Franca Trubiano; Supervisor, David Leatherbarrow

Giovanni Battista Piranesi's architectural representations have made significant contributions to the historiography of early modern architecture. His achievements in this regard continue to enthrall many a contemporary scholar solicitous in identifying the larger polemical and theoretical context within which he imaginatively depicted architectural figures. The following dissertation maintains Piranesi's inventive manner was largely characterized by his return to the prodigious number of ruins which demonstrated the presence in antiquity of forms of figuration incongruous, licentious and capricious. So vast had been their numbers, Piranesi adopted their eccentric characteristics in the creation of his own genres of representation. And revealing the extent to which he recognized in their midst ancient modes of 'grotesque' figuration is the aim of this dissertation.
Foremost in his embrace of antiquity had been the enthusiasm with which he penned hundreds of pages of text and etched thousands of ornamental fragments, sites which had privileged architecture's narrative dimension. His obsessive preoccupation with paintings, sculptures and furnishings revealed, moreover, an unremitting fascination for ornamental surfaces. In this regard, he explored two distinct settings; the subterranean grotto and the pastoral landscape, locations in the Roman campagnia to which he had been compulsively attracted throughout his career as both had demonstrated the presence in antiquity of a plethora of grotesqueries whose meaning Piranesi sought to decipher.
To this end, he undertook a journey to the origins of ornaments in ancient ritual practices. Seminal in this regard had been the ancient city of Herculaneum in whose excavated fragments a culture endowed with a surplus of 'licentious' manners had been recognized. During the 18th century this ancient territory's capricious proclivity was theoretically construed. And in hundreds of ornamental artifacts, forms of figuration were celebrated for their apotropaic functions. Ancient griffins, serpents, satyrs and sphinxes endowed with talismanic powers proliferated throughout the Bay of Naples, and their presence evidenced ancient forms of Bacchic worship. Piranesi's unequivocal attention to this family of figures is the focus of this dissertation. For with every frenetic act of interlacing, he sought to resurface a narrative dimension of architectural ornaments increasingly obfuscated by modernity.

The Perambulations of Hadrian – A Walk Through Hadrian's Viilla
Michael R. Ytterberg; Supervisor, Lothar Haselberger

Hadrian's Villa is one of the major monuments of the history of Western architecture, yet in spite of its preeminent stature, the accessibility of its site, and its much attested power and allure, available information on the Villa remains frustratingly vague as to the specific configuration of its architectural schema. This is not due to of a lack of scholarly attention. The Villa is one of the most studied monuments in archaeology. Yet due in part to the Villa's condition and complexity, it is still not possible to describe with specificity the nature of its design and use, ultimately leaving inconclusive even the most learned speculation about its meaning and significance. Far from exhausting the Villa as a subject for study, recent scholarship has now laid the groundwork for a provisional attempt at a synthesis that explains the workings of the whole.
This dissertation proposes hypotheses for geometric planning principles, building uses, and circulation patterns for this complex site, in the process uncovering hidden and unanticipated meanings. The focus is on the retrieval and analysis of the imagery of environmental experience as a synthetic whole as a way of increasing the understanding of historic contexts. Plans, diagrams, and analytic views uncover conceptual structures implicit in the evidence yet no longer visible to the visitor of the ruins. The culmination of the study is the recreation of the imagery of Hadrian's Villa communicated by a sequence of images which would be encountered on a walk through the Villa that a contemporary visitor might typically have taken. The Villa was created for movement through space from one evocative cultural statement to another, each unlike the rest, distilling its society and times into a concentrated array of appropriate themes and symbols. This is architecture as gesture, an active element in the mimesis of social structure through symbolic means. Both how the Villa worked and what it meant can only be clarified by a systematic visual analysis that affords a glimpse into the transitory world of experience lived and willed by Hadrian, an extraordinary human being who was emperor of the Roman world for twenty one years nearly twenty centuries ago.

DISSERTATIONS
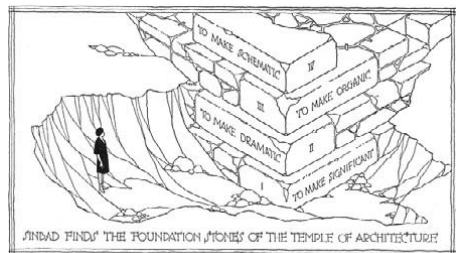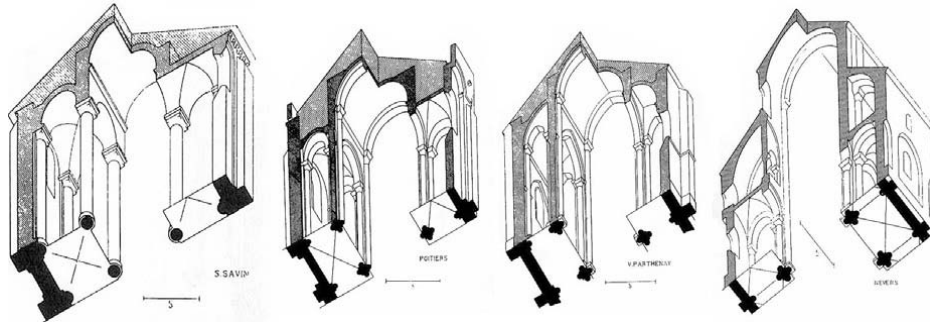
EVENTS

FALL 2005 LECTURE SERIES

In Process
Yolande Daniels, Columbia University + SUMO, New York
September 22

Four Projects, Lost in Translation
Massimiliano Fuksas, Fuksas Architects, Rome
September 29
Sponsored by Ewing Cole Architects

Non Contingent Locations
Homa Farjadi, PennDesign + Farjadi Architects, London
October 10

VOID & FLORID: Tensions in 20th-Century Architecture
Kurt Forster, Yale University
October 17

Peripheral Vision
Marion Weiss, PennDesign + Weiss/ Manfredi Architects, New York
November 3

BOOK LAUNCH

Structure and Meaning in Human Settlements
Edited by Tony Atkin and Joseph Rykwert
November 17

SYMPOSIUM

Simulation + Buildings
Building Simulation Group, PennDesign
September 24 – 25

Workshops in Irreducible Complexity: Next Steps for Architecture and Science
Non-Linear Systems Organization (NLSO)
November 10 – 11

Keynote speaker:
Cecil Balmond, Executive Director, NLSO + Paul Cret Professor, PennDesign

2005-2006 Sponsored Research
From Nanostructures to Buildings: Generating an Architecture of Crystal Geometries
   Benjamin Aranda, Terraswarm
   Daniel Bosia, Arup
   Winding Coordinates: Floer Homologies of 1-Bridge Torus Knots
   Philip Ording

Respondents:
On the Aesthetics of Figuring
   Margaret Wertheim, The Institute for Figuring
Design as Research: A Design Tool as a Research Platform
   Robert Aish, Bentley Systems
Coexisting with what Tumbles out from the Monad
   Ben Nicholson, Illinois Institute of Technology, College of Architecture

Workshops:
Working with New Paradigms, New Models
   Detlef Mertins, Moderator, Executive Advisor, NLSO
   Fotini Markopoulou Kalamara, The Perimeter Institute
   Cecil Balmond, Executive Director, NLSO
   Ben Nicholson, Illinois Institute of Technology, College of Architecture
   Philip Ording, Fellow of the NLSO
   Margaret Wertheim, The Institute for Figuring
   Yama Karim, Daniel Libeskind and Associates

Negotiating Technological Systems and Organizations of Life
   Helene Furjan, Moderator, PennDesign
   Mark Yim, Penn Engineering, MEAM
   Jason Johnson, PennDesign
   Rhett Russo, PennDesign
   Simon Greenwold, MIT Media Lab & Michael Meredith, Harvard GSD
   Ciro Najile, Cornell University
   Heather Roberge, UCLA

Designing Tools, Evolving Instrumentalities
   David Ruy, Moderator, Director of Research, NLSO
   Hernan Diaz Alonso, Colubia GSAPP / Sci-Arc
   Ferda Kolatan, PennDesign
   Marcelo Spina, Harvard GSD
   Benjamin Aranda, Fellow of the NLSO, Terraswarm
   Daniel Bosia, Fellow of the NLSO, Arup
   Robert Aish, Bentley Systems

SPRING 2006 LECTURE SERIES

Pattern Integrity
Jonathan Massey, Syracuse University School of Architecture
January 17

Recent Works
Ben Van Berkel, Staedelschule, Frankfurt + UN Studio, Amsterdam
January 19

Contour Crafting & Bio-Politics
François Roche and Berokh Khosnhevis
January 26

Catalytic Formations
Ali Rahim, PennDesign+Contemporary Architecture Practice, New York
February 2

Pavilions, Observatories and Recycled Landscapes
Iñaki Ábalos, Ábalos & Herreros, Madrid
February 6

Unrestricted Architecture
Roger Duffy, Skidmore, Owings & Merrill, LLP, New York
February 13
The Iconic Building, the Power of Enigma
Charles Jencks
February 20

Computation, Cognition and Practice
Dennis Shelden, Gehry Technologies
February 23

Making Public Buildings
David Adjaye, Louis I. Kahn Visiting Professor of Architecture,
PennDesign / Principal, Adjaye/Associates, London
March 16
Sponsored by Skidmore, Owings & Merrill, LLP

Modern in a Post-modern World
Terence Riley, Miami Art Museum
March 30

Correcting the Seven Fallacies of Architectural Culture
Douglas S. Kelbaugh, University of Michigan
The Don Prowler Lecture in Sustainable Design
April 17

**BOOK LAUNCHES**

Catalytic Formations
Ali Rahim
February 2

Crib Sheets
Helene Furján with Sylvia Lavin
March 27

PENNDESIGN CHARETTE 2006

Disaster Complexity+
February 10 – 12

Global Issue, A Local Context
Disaster Complexity+ examined disaster awareness,
preparedness, planning, design and implementation with the
intention to mitigate natural disasters in Philadelphia and the
world. In particular, the intention of the charette was to investigate
the role of the designer in this context. The charette brought
together design practitioners, NGO's and government officials
to discuss and improve efforts of implementation. It provided
the opportunity for information sharing, redefining the role of
designers with disaster mitigation and design at the local scale.
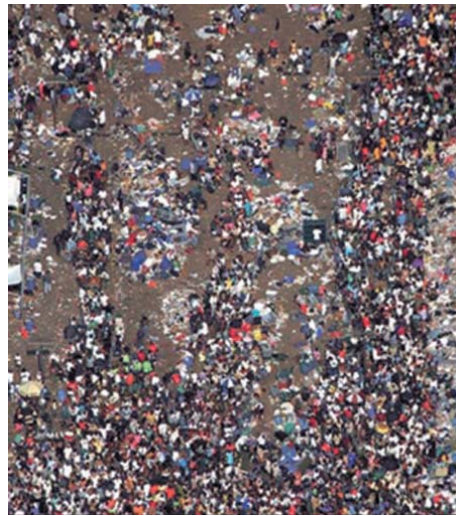
Keynote Lecture:
Manuel De Landa, PennDesign, "Mathematics of Disasters"

Panelists:
Ignacio Bunster-Ossa, Landscape Architect/Planner, partner,
Wallace Roberts & Todd
Nancy Carpenter, Federal Emergency Management Agency,
Region III Mitigation Division
Behrokh Khoshnevis, Professor Department of Industrial and
Systems Engineering, University of Southern California
Kathleen Mulvenna, US Army Corps of Engineers
Anuradha Mathur/ Ali Rahim, moderators

Panelists:
Andrew Coates, Structural Engineer, Buro Happold
Gayle Katzman, Infrastructural Engineer, ARUP
Colin Franklin, Andropogon Associates, Philadelphia
Theodore Spyropoulos, Architectural Association, DRL

SYMPOSIA

Mexico City NEXT
April 7

The symposium sought to explore the future of architecture in
Mexico City and was organized by Enrique Norten, Ella Warren
Shafer Miller Practice Professor in Architecture.

  Participants:
  Salvador Arroyo, Architect, Mexico City
  Tatiana Bilbao, Architect, Mexico City
  Jose M. Castillo, Architect, Mexico City
  Alejandro Hernandez Galvez, Architect & Critic, Mexico City
  Pamela Puchalski, Deputy Director of the AIA-NY, New York
  Michel Rojkind, Architect, Mexico City
  Haydee Rovirosa, Art Curator & Collector, Mexico City
  Javier Sanchez, Architect, Mexico City
  Irina Verona, Architect & Editor, Praxis, New York

BOOM: New Architecture in Philadelphia
January 23

The symposium (and accompanying exhibition) grew out of
a simple curiosity about the changes in the city's life and
economy, and the kind and caliber of the architecture now being
built. Curated by William Braham, Annette Fierro, Detlef Mertins
and AJ Pires.

  Panelists:
  Omar Blaik
  David Brownlee, Chair & Professor, Department of the History
  of Art, PennDesign
  John Claypool, Executive Director, AIA Philadelphia
  Winka Dubbeldam, PennDesign + Archi-Tectonics, New York
  Tony Goldman, Goldman Properties, New York
  Greg Hill, Brown Hill Development, Philadelphia
  Stephen Kieran, PennDesign + KieranTimberlake Associates,
  Philadelphia
  Tim McDonald, Onion Flats, Philadelphia
  Detlef Mertins, Moderator, PennDesign
  Inga Saffron, Philadelphia Inquirer

  Exhibitors:
  Archi-Tectonics
  Bohlin Cywinski & Jackson
  Erdy McHenry Architecture
  KieranTimberlake Associates
  Make & Associates
  Richard Meier & Partners Architects
  MGA Partners
  Onion Flats
  Pelli Clarke Pelli Associates
  Mose Safdie & Associates
  SHoP Architects
  Robert A.M. Stern Architects
  Tod Williams Billie Tsien & Architects

EXHIBITIONS

BOOM: New Architecture in Philadelphia
Upper Gallery, Meyerson Hall
January 23 – 29, 2006

Facilities/Real Estate Services – University of Pennsylvania
February 20 – April 14, 2006

School of Architecture – Temple University
May 30 – June 8, 2006

NEWS

STANDING FACULTY

Tony Atkin co-edited Structure and Meaning in Human Settlements with Joseph Rykwert, published by University of Pennsylvania Museum of Archaeology and Anthropology.

Cecil Balmond designed the 2006 Serpentine Gallery Pavilion in London with Rem Koolhaas. He lectured at the Knowlton School of Architecture at Ohio State University. He contributed to PA 27: Tooling (Pamphlet Architecture) and gave the keynote speech as the Executive Director at the first Non-linear Systems Organization Conference at Penn.
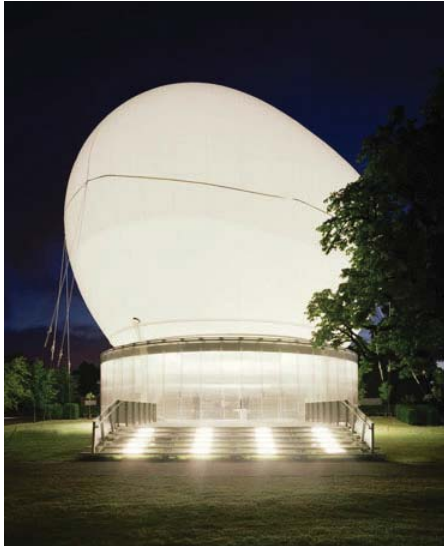

William Braham was inducted into the 2006 College of Fellows of the American Institute of Architects in a ceremony held in Frank Gehry's Disney Hall, Los Angeles. He is co-editing a book with Jonathan Hale and John Sadar, Rethinking Technology: A Reader in Architectural Theory. He also gave two keynote lectures: "What do Systems Want?" at the Penn State University conference, "What Do Buildings Want?" and "Rethinking Environmental Technology" at Temple University's ARCC/EAAE Conference.

Winka Dubbeldam's firm, Archi-Tectonics, received the International Interior Design Association's first annual Smart Environment Award, co-sponsored by Metropolis magazine for their project GW/8B Loft, New York. The competition honors the best in design solutions over the past five years that are environmentally and socially responsible, as well as beautiful and functional. In addition to lectures given at Cornell and the AIANY, Winka presented the lecture "From HardWare to SoftForm" at the Architectural Association, London. The firm's work was featured in numerous publications and they participated in several exhibitions including the London Architecture Biennale in June 2006.

Helene Furján co-edited Crib Sheets: Notes on the Contemporary Architectural Conversation, with Sylvia Lavin, published by Monacelli Press.

Annette Fierro, Associate Professor of Architecture and Jenny Sabin, Lecturer, collaborated on the exhibition PennBike, a visionary bicycle proposal, on display for one month at the Graduate Student Center at the University of Pennsylvania. This project for bicycle storage and security solutions was requested by the Penn Public Safety and Real Estate Services.

locker structure and mesh derivation

PennBike
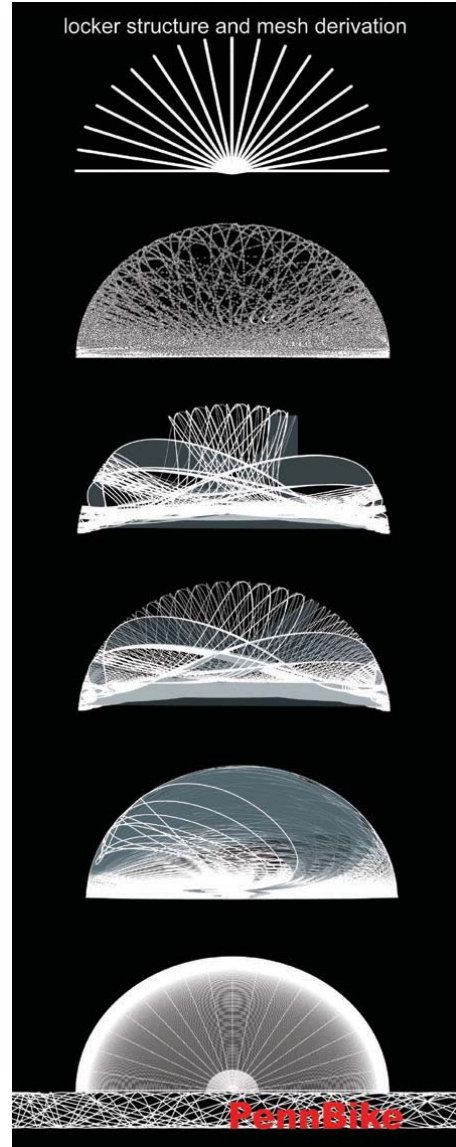
Stephen Kieran and James Timberlake's firm, KieranTimberlake Associates, were awarded three Honor Awards by the Philadelphia chapter of the AIA. The projects awarded included Alice H. Cook House (Cornell University), Pierson College (Yale University), and Loblolly House (Taylor's Island, MD). The Loblolly House, an off-site fabricated structure, will also be featured in a publication and documentary film.

David Leatherbarrow gave lectures at the University College in Dublin, the University of Toronto, the University of Edinburgh and was a visiting critic at the University of Virginia and North Carolina State. He presented papers at numerous institutions including the Pontificia Universidad Catolica del Peru in Lima and Southeast University in Nanjing, China. He held a book signing and gave a lecture at the National Building Museum in Washington D.C. for his publication Topographical Stories.

Peter McCleary served on design reviews at Arizona, Columbia, and Harvard. He gave lectures at the Institute for Lightweight Structures at the University of Stuttgart, Germany and IberoAmerica University in Mexico City. He also chaired a symposium on ecology and technology in Costa Rica.

Detlef Mertins published essays on Mies van der Rohe in Grey Room 20 and Perspecta 37 (Famous). He gave a paper at the conference on Philip Johnson at Yale University and participated in a conference on Kazuyo Sejima's new Glass Pavilion for the Toledo Art Museum. He also lectured at the Architecture Association in London and moderated the symposium, BOOM: New Architecture in Philadelphia. He contributed a catalogue essay for the exhibition, Zaha Hadid, at the Solomon R. Guggenheim Museum in New York.

Enrique Norten essays on Mies van der Rohe in Grey Room 20 and Perspecta 37 (Famous). He gave a paper at the conference on Philip Johnson at Yale University and participated in a conference on Kazuyo Sejima's new Glass Pavilion for the Toledo Art Museum. He also lectured at the Architecture Association in London and moderated the symposium, BOOM: New Architecture in Philadelphia. He contributed a catalogue essay for the exhibition, Zaha Hadid, at the Solomon R. Guggenheim Museum in New York.

Ali Rahim was promoted to Associate Professor with tenure. His book, Catalytic Formations: Architecture and Digital Design was published by Taylor & Francis. His designs were published in numerous journals and selected by Zaha Hadid for inclusion in the prestigious 10 x 10_2, published by Phaidon Press. He participated in the exhibitions Drilling Core Exhibition (Vienna) and Entry 2006 (Berlin). He also gave lectures at Yale University, University of California, Berkeley, University of Idaho, American Institute of Architecture New York Chapter, Ohio State University, University of Pennsylvania, Architecture Association London, Bartlett School of Architecture, and Pratt Institute.

Witold Rybczynski was awarded a Doctor of Laws degree (honoris causa) by the University of Western Ontario, Canada. He served as a juror for the Richard H. Driehaus Prize and contributed to various publications, including architectural critic for Slate.

Emeritus Professor Joseph Rykwert gave lectures in Budapest, Barcelona, Karlsruhr and at conferences in Venice, Vancouver and Los Angeles. He received an honorary doctorate from the University of Toronto and is consultant to the doctoral program at the Frederick II University in Naples and to the editorial board of Gaudi. His new book, *The Judicious Eye*, is forthcoming.

Harris Steinberg was elected to the 2006 College of Fellows of the American Institute of Architects. He was also a member of a six-person delegation to Sri Lanka invited by the US Ambassador to Sri Lanka to investigate the creation of long term relationships between Penn and Sri Lanka to help build civic capacity, working on issues of urban design and planning.

Cathrine Veikos received a 2006 grant from the Graham Foundation for Advanced Studies in the Fine Arts for "Intricacy", and the 2006 Alice Paul Research Center Grant for Summer Research Support from the Trustee's Council of Penn Women for "Lina Bo Bardi, Material Effects. She gave the 2005 Cass Gilbert Lecture at the University of Minnesota, "Lina Bo Bardi: Built by Hand." She also wrote and contributed to several publications and was the Topic Chair for the 94th ACSA National Conference, Salt Lake City, with a lecture titled "Visionary Images."

Marion Weiss firm's competition-winning project for the Barnard College Nexus, a new multi-use arts building in New York City, won an AIA projects honor award and was featured in Architects Newspaper in an issue on innovative uses of glass. Her Olympic Sculpture Park for the Seattle Art Museum, winner of a national competition and Progressive Architecture Award, was featured in the Museum of Modern Art's exhibition, "Groundswell: Designing the Contemporary Landscape". The sculpture park, which opens in fall 2006 was also exhibited in "Cities: 10 Lines, Approaches to City and Open Territory Design" curated by Joan Busquets and Felipe Correa at the Harvard GSD. Her firm's recently completed Whitney Center, a retreat for the United Nations, was inaugurated in May 2006 with a conference hosted by Kofi Annan. She gave lectures at the Cooper Union, the Architectural League, the Chicago Art Institute and the National Building Museum. In spring of 2006 she was promoted to full professor and named the Graham Chair Professor of Architecture. Her spring studio on New Orleans, "Resilient Topographies", was selected for exhibition in the 2006 Venice Architecture Biennale.
"Image by BHCH, Inc. / Courtesy of Weiss/Manfredi Architects"

Richard Wesley received the 2006 Award for Distinguished Teaching in the Undergraduate Programs in the School of Design.

LECTURERS

Scott Erdy and David McHenry's firm, Erdy McHenry Architecture, won its second Silver Medal in as many years at the annual Philadelphia AIA Design Awards. The award was given for The Coatesville Redevelopment project in Coatesville, PA. The jury also gave them an Award of Recognition for the Schmidt's Garage project in Northern Liberties.

Jason Johnson and his design research office, Future Cities Lab, were awarded a Second-Prize for their Seoul Performing Arts Center competition entry. The project was produced in collaboration with designer Nataly Gattegno.
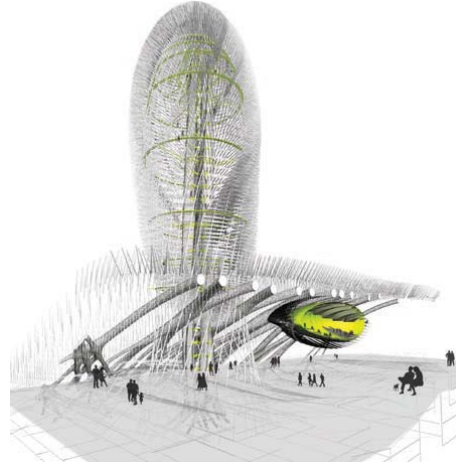
Ferda Kolatan gave a lecture on "Responsive Architecture through Parametric Design" at the Wolfram Science Conference, Washington D.C.

Andrew Phillips' firm, dommertphillips, was selected as a semi-finalist for the President's House Commemorative Project by the City of Philadelphia and Independence National Historical Park. dommertphillips designed and installed the exhibit Lincolns in Philadelphia at the James A. Byrne U.S. Courthouse in Philadelphia, PA. The exhibit incorporated artifacts, graphics and reproductions of historical documents.

Rhett Russo sponsored Penn Design students, Jonathan Kowalkoski & Ryan Keerns, in the ACSA Airport.Security. Circulation, International Student Design Competition, where they received third prize.

David Ruy was appointed Director of Research for the newly founded Non-Linear Systems Organization and organized its first annual conference, "Workshops in Irreducible Complexity."

Srdjan Jovanovic Weiss exhibited Stadium Culture, Centre for Recreation and New Media in Serbia at the Istanbul Architecture biennial in April 2006. His publication Almost Architecture was launched in conjunction with an exhibition at the Akademie Schloss Solitude in Stuttgart in June 2006 and coincided with the inclusion of Weiss' current design for Stadium Culture in "The Good Life: Design and Recreation" exhibition organized by Van Alen Institute on Pier 40 Hudson River Park, New York.
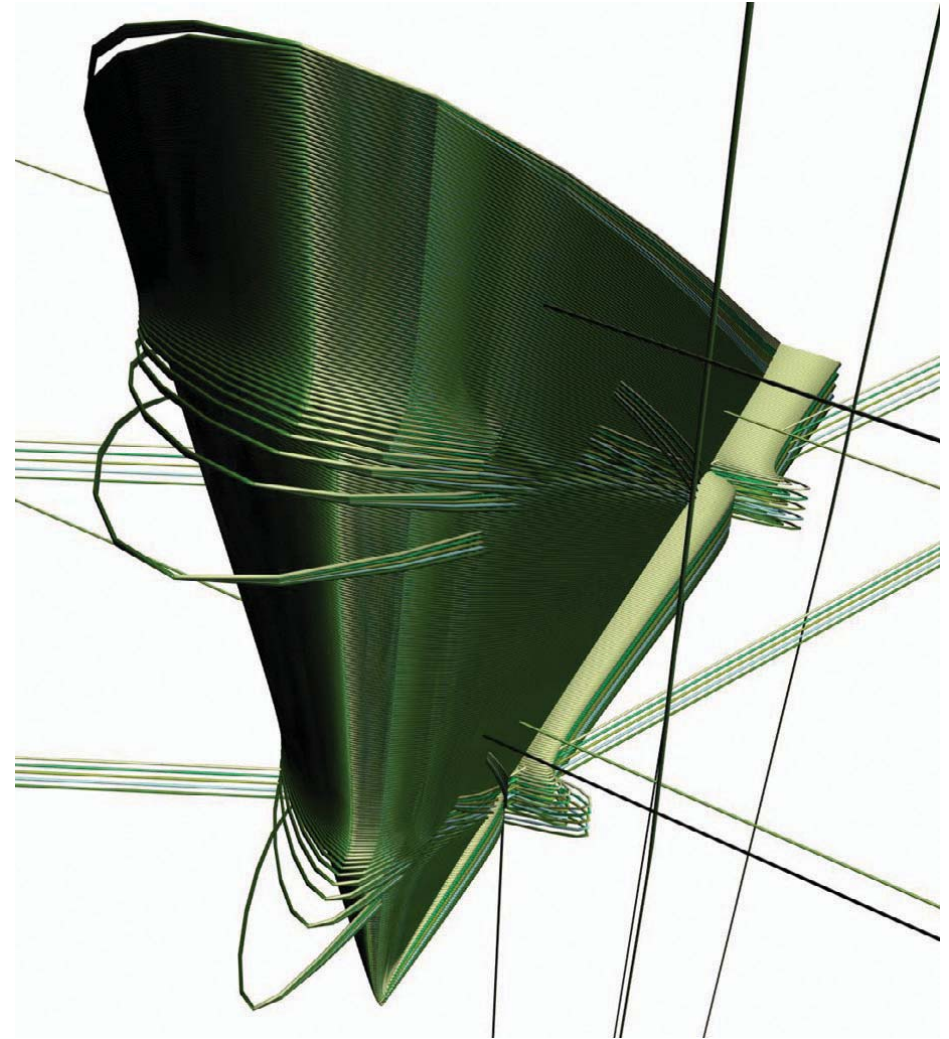
Jenny Sabin was selected to participate in the Smart Geometry 2006 Winter Conference in Cambridge, England on full scholarship sponsored by Bentley Systems. She also attended the Generative Components Summit in summer 2006 in Prague, Czech Republic.

Guy Zucker's design for 'Delicatessen Clothing Store' was featured in Frame, Metropolis, SPA-DE, FX and appeared in the book Dress Code by Frame Publishing. His award winning projects 'Reflector' and 'The Exchange' were exhibited at the Architectural League / Municipal Art Society of NY and The Van Alen Institute NY respectively.

NEWS

STUDENTS

Michael Samula won Honorable Mention in the first annual eVolo Architecture competition 06 Skyscraper.
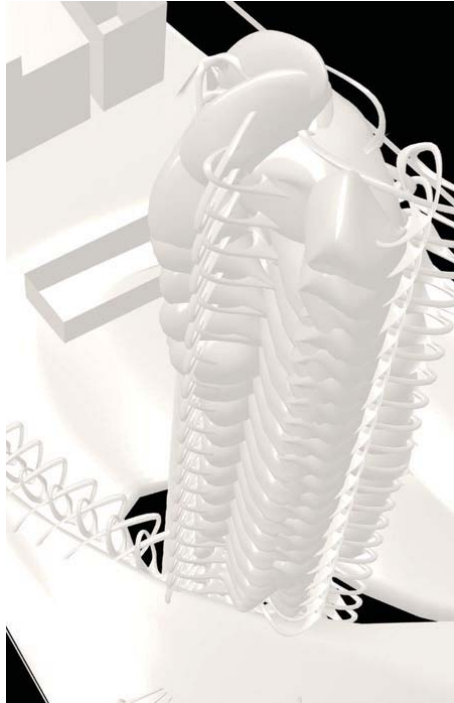
The entry by Joseph Hang, Hyoeun Kim, Yadiel Rivera-Diaz and Janhee Yoo to Architectural Record's New Orleans housing competition was selected for exhibition at the Ogden Musuem, University of New Orleans and at the AIA Convention in Los Angeles, CA.

Ph.D. Candidate Alexander Eisencschmidt was awarded one of three Graham Foundation Trustees' Merit Citations for the Carter Manny Award.

Jonathan Kowalkoski and Ryan Keerns' project Component. Fuselage won 3rd Prize for Overall Design in the 2005-2006 ACSA International Student Design Competition AIRPORT. SECURITY.CIRCULATION (Faculty sponsor, Rhett Russo). The project will be exhibited at the 2007 ACSA Annual Meeting in Philadelphia and the 2007 AIA Convention in San Antonio. Sponsored by the U.S. Department of Homeland Security and administered by the Association of Collegiate School of Architecture (ACSA). http://ww.acsa-arch.org/competitions/airport.aspx
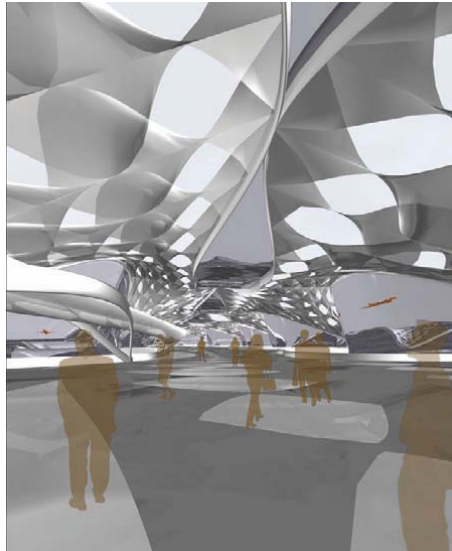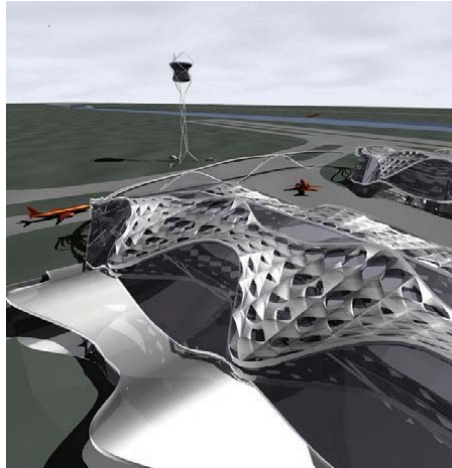
PRIZES AND AWARDS GIVEN TO STUDENTS

American Institute of Architects Henry Adams Medal
First Prize: Nicholas Simon Koster
Second Prize: Brian Ernest Holland

Arthur Spayd Brooke Memorial Prize
Gold Medal: Mary Evans Barensfeld
Silver Medal: Christopher Anders Junkin
Bronze Medal: Paul Privitera

Paul Philippe Cret Medal
Stephen Pitman

Paul Philippe Cret Prize
Jackie Wong

Harry E. Parker Prize
Jessica S. Fein

Alpha Rho Chi Medal
Amy Elizabeth Johnson

Warren Powers Laird Award
Yasmin Bhombal

Charles Merrick Gay Scholarship
Jennifer A. Vander Veer

Samuel K. Schneidman Fellowship
Megan M. Born

Frank Miles Day Memorial Prize
Yasmin Bhombal

Harlan Coornvelt Memorial Medal
Jill M. Lagowski

Mario J. Romanach Fellowship
Jackie Wong

James Smyth Warner Memorial Prize
Jonathan K. Fogelson

Faculty Prize
Justin Diles

Walter R. Leach II Fellowship
Peter Rae

T-Square Club Fellowship
Benjamin B. Muller

Mr. and Mrs. William L. Van Alen Traveling Fellowship
Andrew Schlatter
Erik Simon

Will M. Mehlhorn Scholarship
500-Level
First Prize: Amber Lember
Second Prizes: Todd Costain, Jason Easter,
Andrew P. Lucia
600-Level
First Prize: Catherine Bonier
Second Prize: Nikoletta G. Stagias
Ph.D., M.S. Architecture
First Prize: Alison Hirsch
Second Prize: Anne Lutun

**The Donald Prowler Memorial Prize**
Andrew P. Lucia

Albert F. Schenck- Henry Gillette Woodman Scholarship
First Prize: Daniel Hammerman
Second Prize: Jacob Levine
Honorable Mention: Bryan Berkas, Kowktung-Anthony Chan, Yuteki Dozono, Lokkay Fan, Joseph M. Hoepp, Michael L. Jacobs, Ryan Keerns, Amanda B. Lember, Misako Murata, Ann C. Wright

E. Lewis Dales Traveling Fellowships
Marie Achalabun
Erik Austin
Todd Bennett
Amy Campbell
Jean Pierre Casillas
Isaac Coffey
Robert Ross Findly
Brandon Gehrke
Chauncey Herman
Jessica Hogue
Jae Young Jang
Hyoeun Kim
Harold Kwon
So-Jung Le,
Brad Leibin
Patrick McGovern
Peter Rae
Andrew Schlatter
Lisa Schwert
Erik Simon
Nikoletta Stagias
Clark Thenhaus
Lara Thrasher
Jackie Wong

2006 John Stewardson Memorial Competition Fellowship
Chris Junkin

John Stewardson Memorial Scholarship
First Prize: Chris Junkin
Second Prize: Sung Ho Hong
Third Prize: Benjamin Cadena
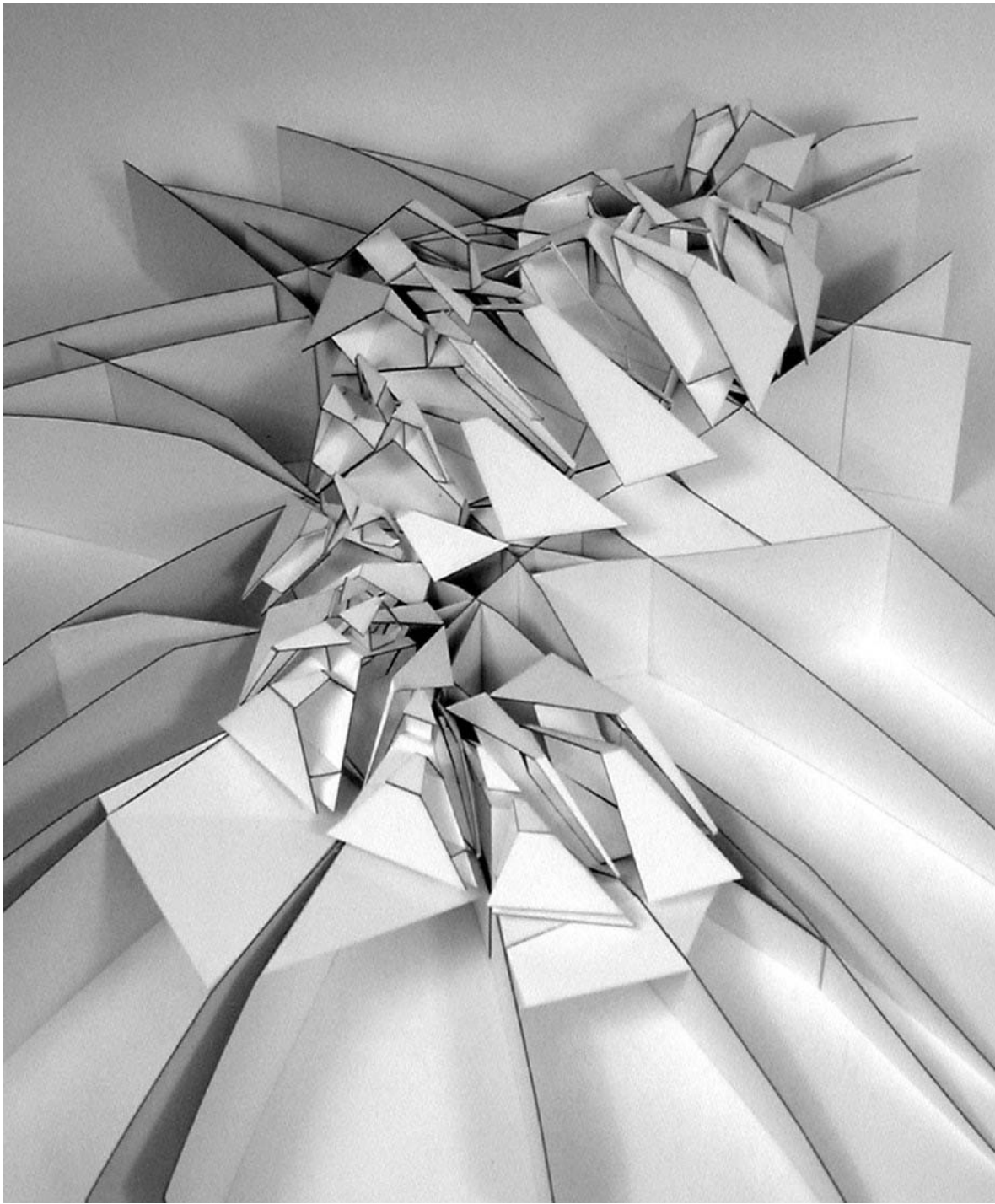
Jessica Hogue: ARCH 602 Studio with Ferda Kolatan: Research Facility Motel at the Santa Fe Institute.