

Projective Views on Urban Metabolism

Doctor of Design Conference
February 7th, 2014 / 10.00 – 18.00
Piper Auditorium / Harvard GSD

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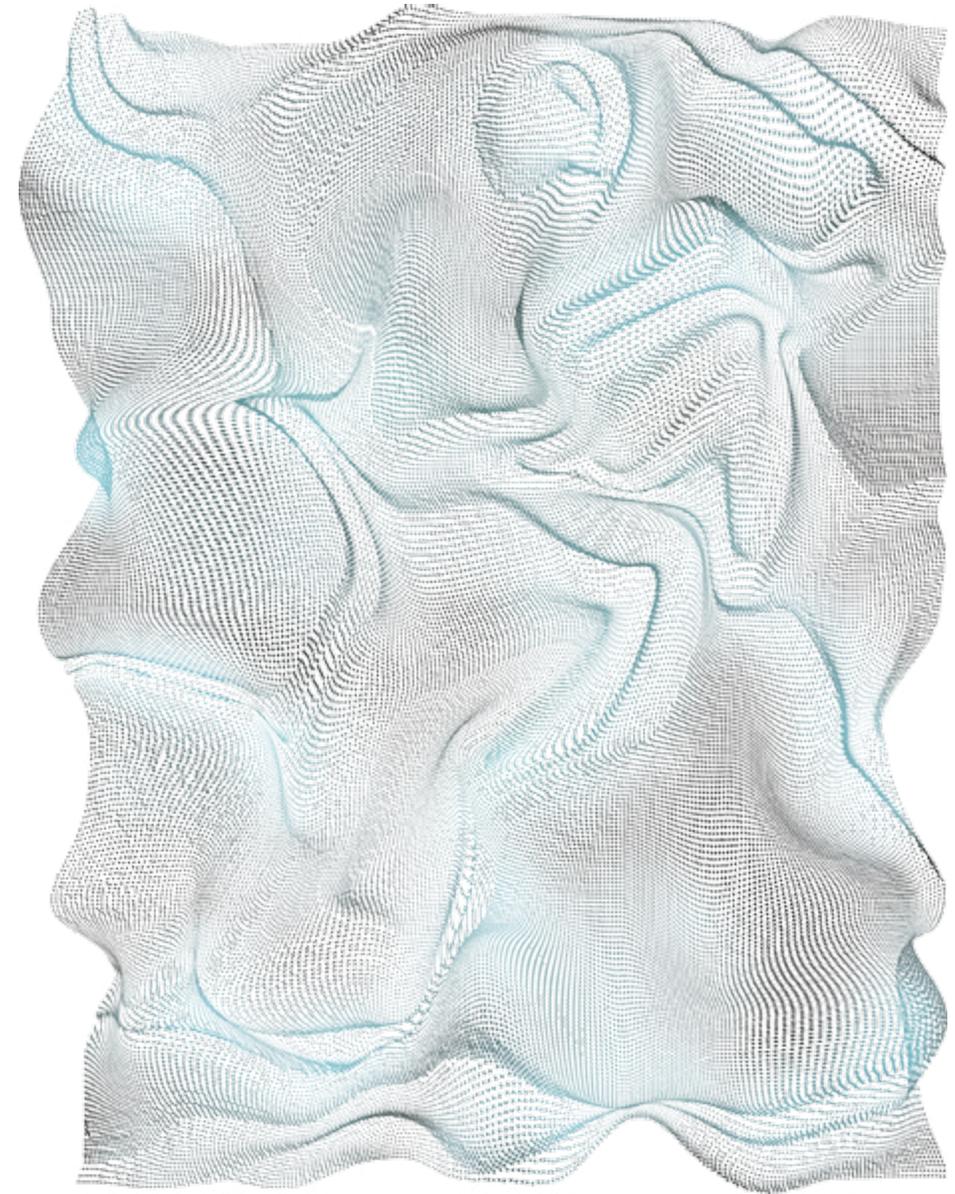
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The conference 'Projective Views of Urban Metabolism' is directly connected to the upcoming issue of the *New Geographies* journal 'Grounding Metabolism' scheduled to be published in May 2014.

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During the last two decades, the concept of urban metabolism, has been subject to both extensive empirical research and, increasingly, critical discussion within the natural and social sciences. Aiming to grasp the continuous processes of energy, material and population exchange within and between cities and their extensive hinterlands, urban metabolism promises a systematic assessment of the complex socio-environmental interdependencies associated with the continuous human occupation of the earth.

At the same time, the design disciplines have often realized the potentials emerging from a projective understanding of urban metabolism in shaping spatial strategies. From Geddes' Valley Section and its postwar interpretation by Team X, to Fuller's regenerative technoscientific utopias, or the megastructures of the Japanese Metabolists, concepts, models and designs have attempted to formalize the links between socioeconomic processes and environmental attributes responding to their respective contexts.

However this task is becoming extremely challenging: On the one hand, the contemporary condition of generalized urbanization is characterized by an unprecedented complexity and planetary up-scaling of metabolic relations, which were historically confined

at the regional scale. On the other hand, while more and more geographically detached and absorbed into a global logistical system of exchange, metabolic relations are still deeply interwoven with territorial transformations in land use systems, settlement typologies, operational infrastructures, and ecological regimes.

At the same time contemporary discussions on urban metabolism have been largely biased between technoscientific approaches, limited to a performative interpretation of flows and and more critical attempts focusing on the sociopolitical. Within this context, design disciplines, fascinated by a need to grasp and reorganize the fluidity of metabolic processes, have privileged notions of elasticity and adaptability ignoring the often-sclerotic nature of settlements, landscapes and infrastructures.

A Projective approach to Urban Metabolism could offer a more elaborate understanding of the relation between organizational models of processes and the formal, physical and material specificities of spatial structures across scales. Alternative, synthetic routes to design –through concepts, models, visualizations, interventions- could expand its agency while enriching the contemporary discussions on Urban Metabolism.

SCHEDULE AND
PANEL STRUCTURE

The goals of "Projective Views on Urban Metabolism" are, through the lens of urban metabolism, to: [Panel 1] generally reassess the planetary rescaling of contemporary urbanization processes; [Panel 2] unpack the historical transformation of spatial forms and structures and subsequently, the emergence of new operative territories for design; [Panel 3] explore the agency of design in confronting these challenges.

Panel One Metabolic Upscaling

Jason W. Moore

Metabolic Rift or Metabolic Shift?
From Dualism to Dialectics in the Emergence
of World-Ecological Modernities

Erle Ellis

Anthropocene Ecologies:
Converging Existential and Conceptual Baselines

Timothy W. Luke

Urbanism as Cyborgenicity:
Tracking the Materialities of the
Anthropocene as Metrometabolomes

Matthew Gandy

Periodicities and Metabolisms

Moderator: Neil Brenner

10.00 - 12.30

SCHEDULE AND
PANEL STRUCTURE

12.30 - 13.30 _ LUNCH BREAK

Panel Two

Territorial
Transformations

Lola Sheppard

Territorial Metabolisms: Far Flung Urbanisms

Salvador Rueda

Towards a New Metabolic System for Cities

Jane Hutton + Kiel Moe

Plotting Central Park and the Empire State Building

Moderator: Pierre Belanger

13.30 - 15.30

15.30 - 16.00 _ COFFEE BREAK

Panel Three

The Agency of Design

Mitchell Joachim

Socio-ecological Design

Chris Reed

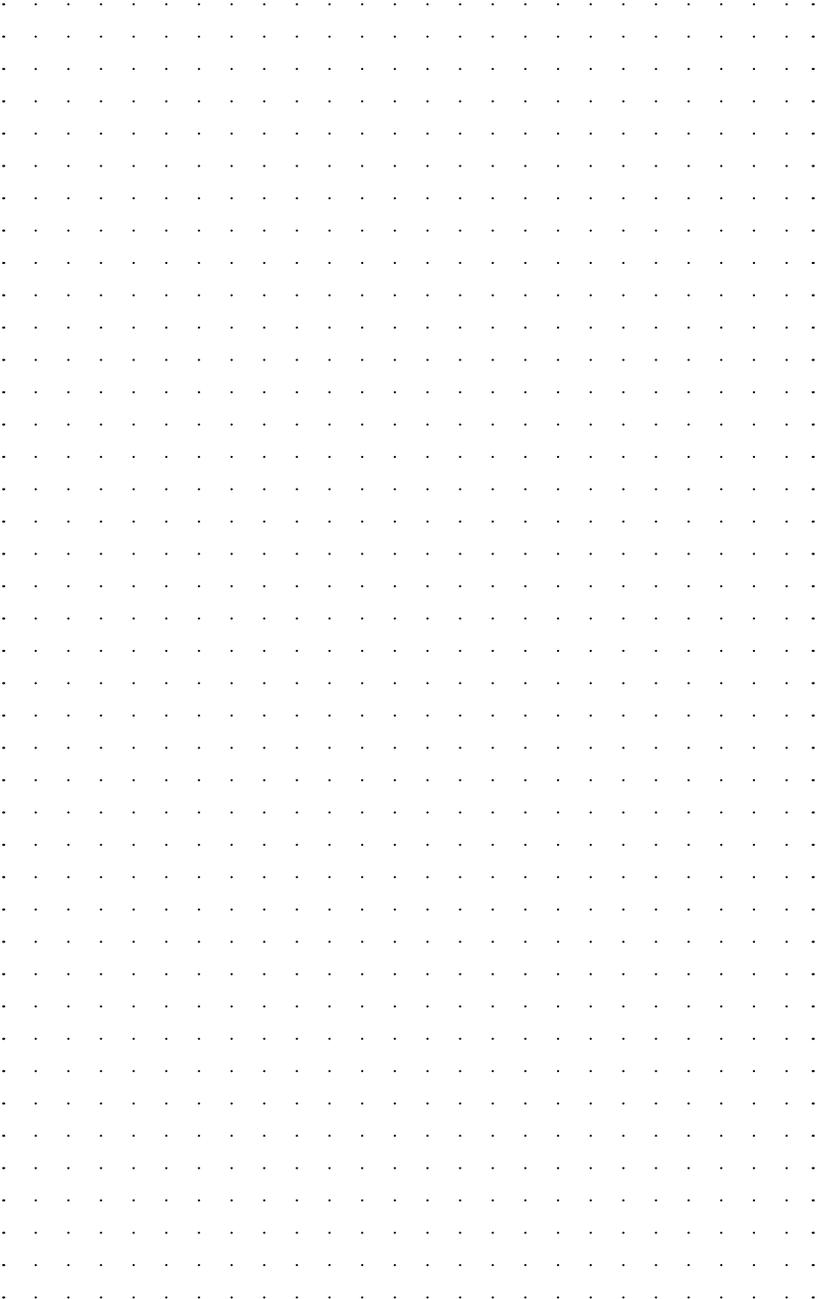
Projective Processes

Ila Berman

Productive Recircuiting

Moderator: Hashim Sarkis

16.00 - 18.00



Jason W. Moore, Erle Ellis,
Timothy W. Luke, Matthew Gandy,
Moderator: Neil Brenner

Jason W. Moore

Metabolic Rift or
Metabolic Shift? From
Dualism to Dialectics in
the Emergence of World-
Ecological Modernities

01

In the flowering of red-green thought over the past two decades, “metabolic rift” thinking is surely one of its most colorful and influential varieties. Emphasizing disruption and separation, rather than reconfiguration and unity, the metabolic rift has come to signify, in Richard York’s words, “a disruption in the exchange between social systems and natural systems.” Social systems are separate from natural systems; social systems *disrupt* natural systems; as capitalism develops, the disruption of nature escalates, leading to “planetary crisis.” Catastrophe ensues. It all makes a certain amount of sense. But is it good sense? The metabolic rift perspective posits capitalism as ontologically prior to the web of life: capitalism *and* nature. The dialectical alternative understands capitalism as a bundle of relations between human and

extra-human natures: capitalism-*in-nature*. In this, capitalism is both producer and product of the web of life, a “rich totality of many determinations” (Marx) that transcends the Nature/Society divide. Such transcendence becomes possible through a view of capitalism *as world-ecology*, joining the accumulation of capital, the pursuit of power, and the co-production of nature as an organic whole. Such a world-ecological perspective allows us to analyze more adequately the historical limits of capitalism in the web of life, and the successive historical natures co-produced over the *longue durée*.

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Erle Ellis

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Ecologies of the Anthropocene: The Global Upscaling of Social-Ecological Infrastructures

02

Human populations and their use of land have transformed more than three quarters of the terrestrial biosphere into anthromes, which range from dense settlements, villages, and croplands to rangelands and seminatural lands with lower levels of population and use. While this global transformation of ecology has been portrayed as recent and unsustainable, human societies have been transforming ecosystems to support their populations since before the last ice age and have sustained this for thousands of years in some regions. The concept of the Anthropocene raises the prospect that this might continue for millennia to come. As human societies have grown, so have the scales of the social-ecological infrastructures needed to sustain them. This global upscaling is accelerating as populations become increasingly concentrated into urban areas, rapidly transforming both the biosphere and society and challenging both to adapt. Yet these changing scales of social-ecological interaction are also creating novel opportunities for society to thrive while nature recovers within the used and seminatural anthromes that form the ecologies of the Anthropocene. To engage with these opportunities is to empower a post-natural view of the human role in shaping nature, guiding us towards greater stewardship, innovation and engagement with the future of humanity and the planet.

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Timothy W. Luke

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Urbanism as Cyborganicity: Tracking the Materialities of the Anthropocene as Metrometabolomes

03

This preliminary critique of the synthetic ecologies sustaining global urbanization traces out the challenges for developing effective understandings of the designed and undesigned elements in urban metabolism as “metrometabolomes.” To elaborate and expand my understanding of the concepts of critical arcology, I deploy alternative concepts tied to exploring cyborganic and machinic ecologies to get beyond city-centric notions of urbanization, modernization, and globalization by tracking the materialities of metrometabolites created by citification across time, which are now embedded in built, unbuilt, and yet-to-be-built environments. Today’s increasingly popular notion of “the Anthropocene” provides a foreground for detailing the aesthetic, formal, material, and symbolic imprints upon the spatial processes and structures associated with citified metabolic processes across with divergent scale, speed, and scope. These probes are vital modes of ecocritique and technocritique needed to unpack the planetary up-scaling of contemporary metabolic processes at work across global citification’s industrial ecologies as questions for political economy. A comprehensive and critical retooling of urbanistic analysis with the insights of cyborganicity might make a key intervention into the long lineage of past approaches to local, regional or national metabolism in relation to urban design by unveiling their blindspots and highlighting their potentials for developing new urbanistic theories and practices.

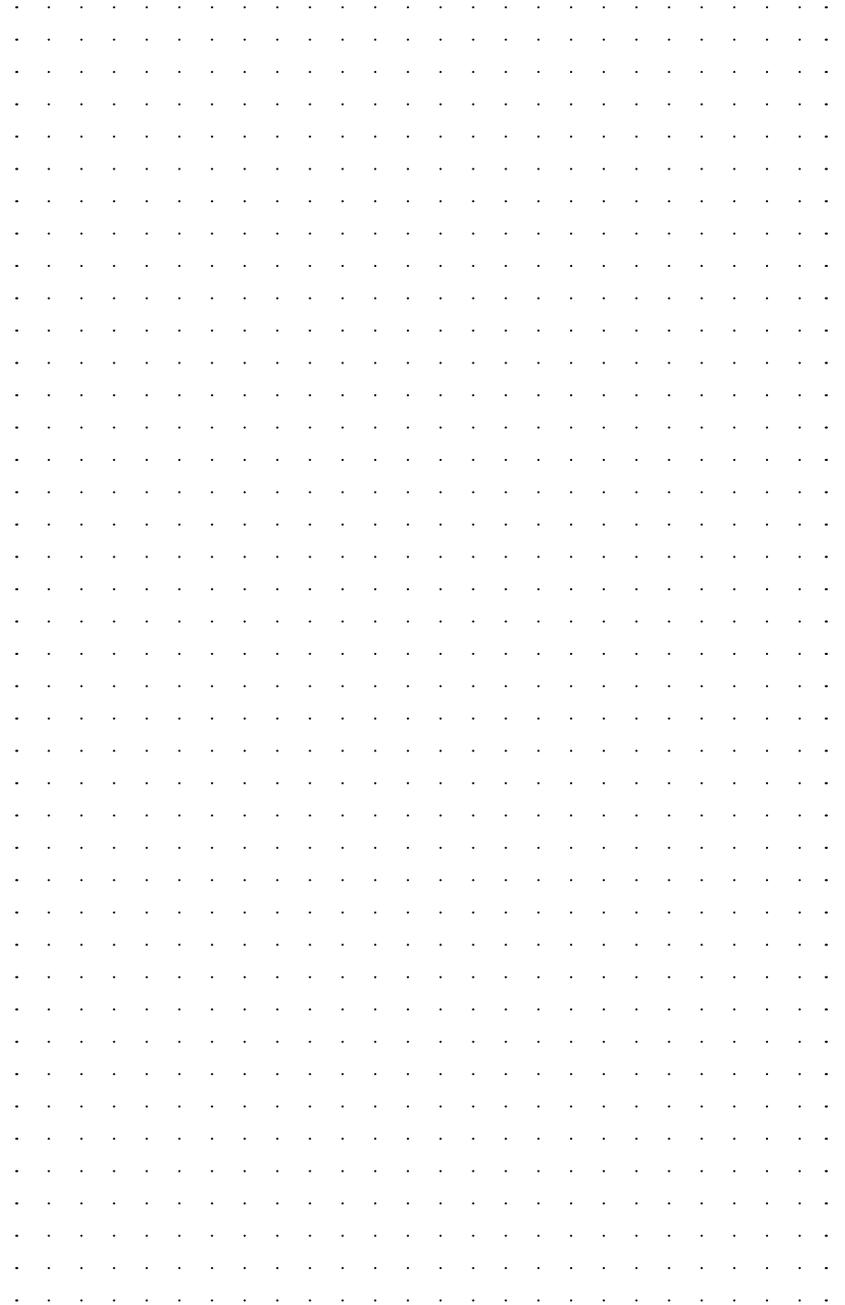
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Matthew Gandy

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Periodicities and Metabolisms

Though we can find metabolic continuities with the past, in terms of basic human needs, the scale and complexity of contemporary urbanization involves a different order of dynamics and interdependencies. The nineteenth-century

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conception of the city as an assemblage of identifiable organs placed particular emphasis on the circulatory dynamics of urban space. In the twentieth century these corporeal analogies were extended to conceive of urban space as an organic machine amenable to increasingly sophisticated types of technical control. The techno-political field of modernity extends to various forms of “scientific urbanism” whereby the city is conceived as a system defined by measurable parameters. The recent shift of emphasis from the organicist city of functional flows and organs to a more diffuse neo-organicist pre-occupation with the digital realm or “thinking space” of the city has not dispelled earlier limitations with corporeal conceptions of urban space.



Territorial Transformations

Lola Sheppard, Salvador Rueda,
Jane Hutton + Kiel Moe
Moderator: Pierre Belanger

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Lola Sheppard



Territorial Metabolisms:
Far Flung Urbanisms

05

In many ways the Canadian North is as far removed from urbanized as one can imagine. With only 100,000 occupying 3.9 million sq. km, it has one of the lowest population densities on earth. Beyond the largest three territorial capitals, most other communities north of 60 degrees have populations less than 1000. Yet, one might argue, communities within the North operate regionally, not unlike larger metropolitan regions in the south—with intense mobility of people, and goods exchanges and services networked. Yet the sheer immensity of the North, coupled with challenging climate and small, remote populations, had rendered the economic equation for conventional models of urbanism impossible. Access to food, health, education and recreation has all adapted to work at the scale of the territory.

Locally, settlement form has no choice but to defer to environment, regional mobility and geography. In this sense, the north offers an opportunity for radical innovation in how we think not of urban metabolism but *territorial metabolisms*—of networks, economies and infrastructures. And in so doing, the remote North may offer models for more synthetic relationships to geography, climate and ecology, in the complex urban regions of the south.

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Salvador Rueda

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Towards a New Metabolic System for Cities

06

The Earth is a system that is open in energy and practically closed in materials, but the systems that it supports are open systems both in energy and materials. From the outset, the planning of any organizational aspect of the city or the territory must take into account the natural resources. The relation established must be purposeful and aimed at achieving maximum efficiency in the use of resources and minimum disturbance to the ecosystems. In nature, both the process of evolution and the succession of ecosystems are linked to the increase in efficiency in the consumption of resources to obtain equivalent or greater levels of organization. Those that fail to fulfill this law end up disappearing. Our way of acting is just the opposite because we obtain advantageous competitive positions if we are capable of consuming more resources than others; it does not matter how efficient we are. However, this strategy for competing based on the increase in the disturbance of the systems is simply “unsustainable”. Our strategy for competing must be based on information and knowledge, and increasingly less on the consumption of resources. Obtaining greater organized information (H) with a lower consumption of resources (E) is the equation of sustainability and is therefore the direction to take in all the areas and policies of planning in general, and of the metabolism in particular. In a process aimed at sustainability, the quotient E/H must become increasingly small. The current tendency, however, is the opposite, and inefficiency is the best ally of competitiveness.

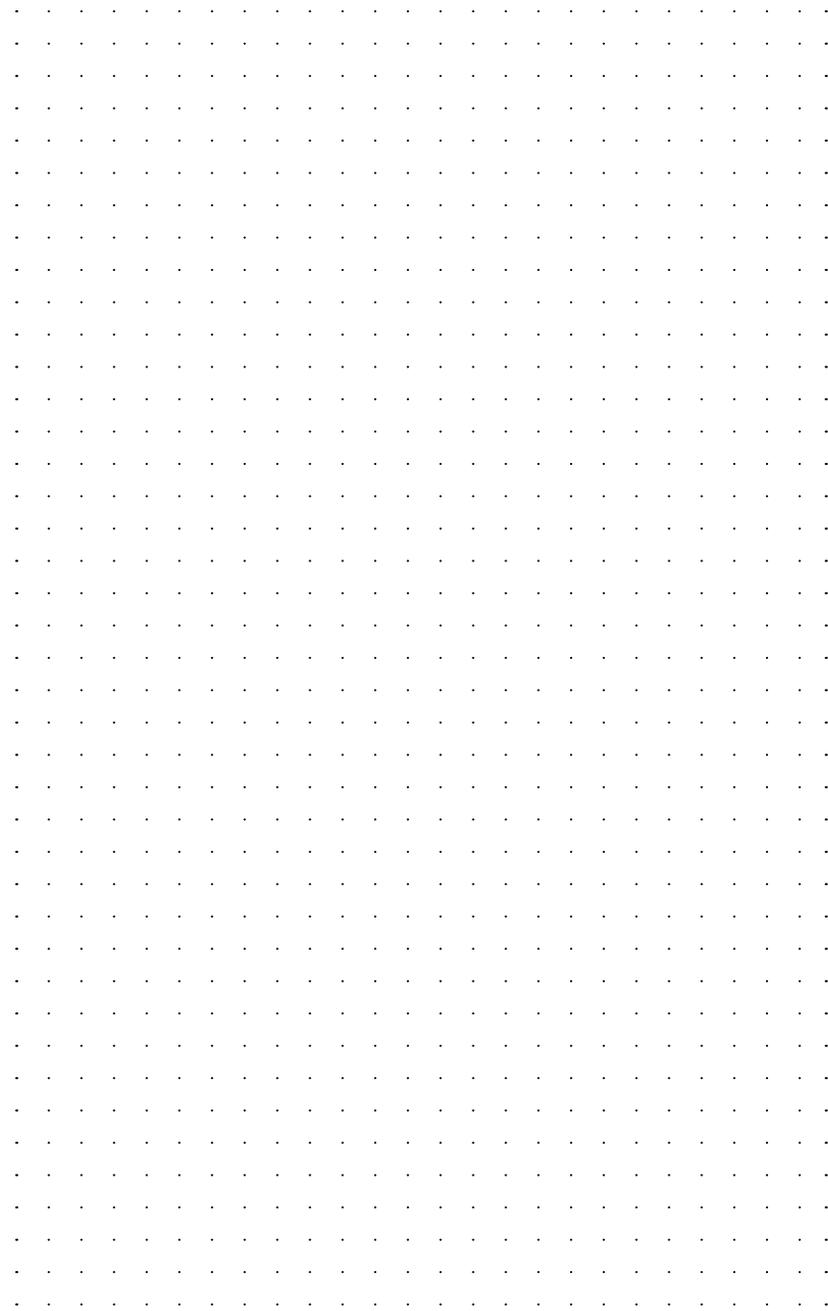
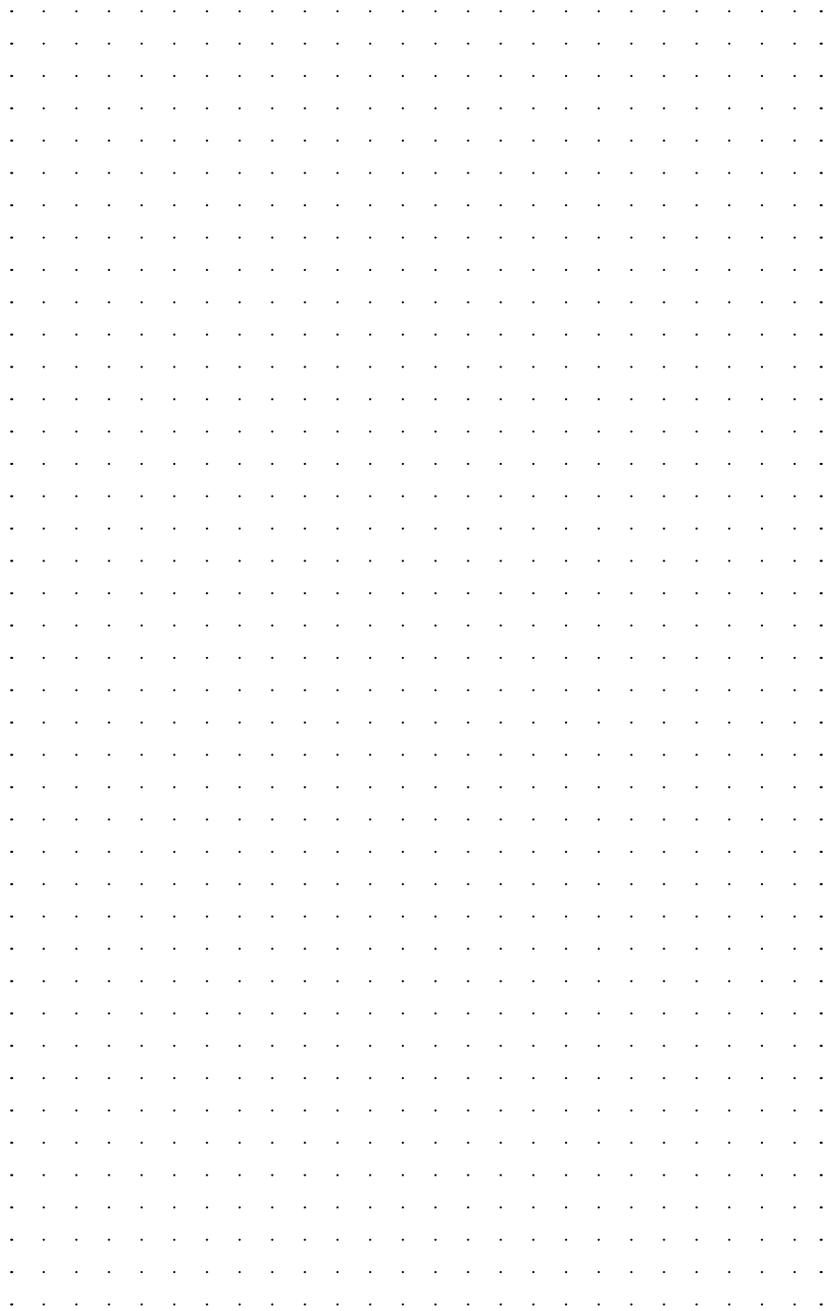
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Jane Hutton + Kiel Moe

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Plotting Central Park and the Empire State Building

07

This research plots the material and energy flows of the Central Park and Empire State building sites – two of the most iconic parcels of land in the world. The project examines the broader ecological and social consequences of past construction regimes in order to speculate about future ones. To do so, we are identifying, modeling, and quantifying materials used on site over 200 years of emblematic urban change. This renders not only an account of the energetic and material inputs involved in each construction, it maps their extended geographical relations through tracing material sources, transportation, and labor. These adjuncts to buildings and landscape are habitually dismissed as externalities but in reality are massive constructions of matter and energy in their own right. This scope of documentation reveals much about the role that the construction of buildings and landscapes play beyond the immediate, visible urban environment.





The Agency of Design

Mitchell Joachim,
Chris Reed, Ila Berman,
Moderator: Hashim Sarkis

Mitchell Joachim

Socio-ecological Design

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Through our creative projects and outreach efforts, we aim to illuminate the environmental possibilities of New York City. We are a unique laboratory for scientists, artists, architects, students, and individuals of many backgrounds to explore and advance the larger framework of socio-ecological design. The group develops innovative solutions and technologies for local sustainability in energy, transportation, infrastructure, buildings, waste treatment, food, and water. These solutions are derived from the interface of design, science, engineering and synthetic biology.

Chris Reed

Projective Processes

The past few decades have witnessed a resurgence of interest in dynamic ecologies and landscape within contemporary design discourse. In part, this was fueled by ecologists' reconceptualization of the world as a dynamic, ever-evolving and changing place, continually responding to inputs and circumstance. But it was also fueled by designers' ambitions to open up discrete disciplinary pursuits to a broader set of informants as a step toward projects which hybridize architectural, urbanistic and landscape agendas. As part of this work, both ecologists and designers have been productively obsessed with the ways in which these ideas of dynamism,

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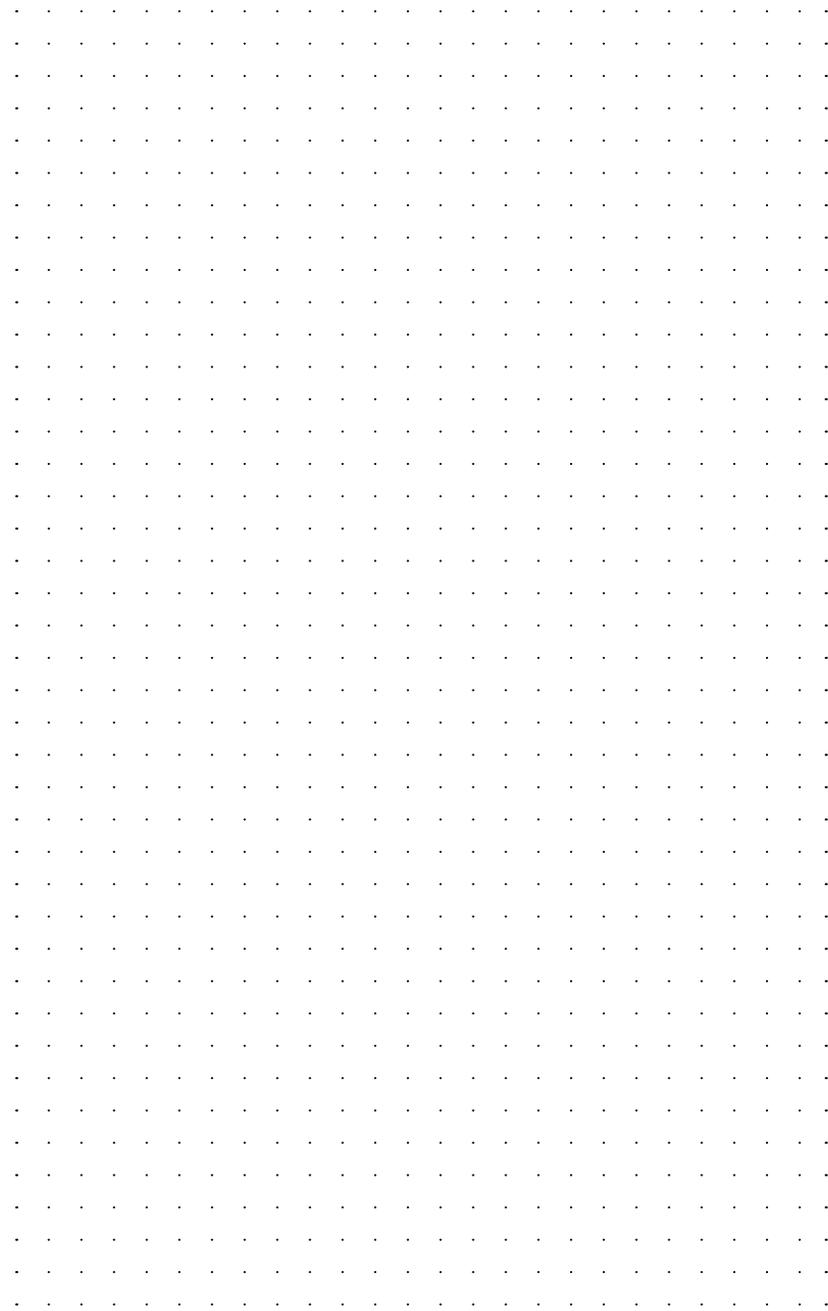
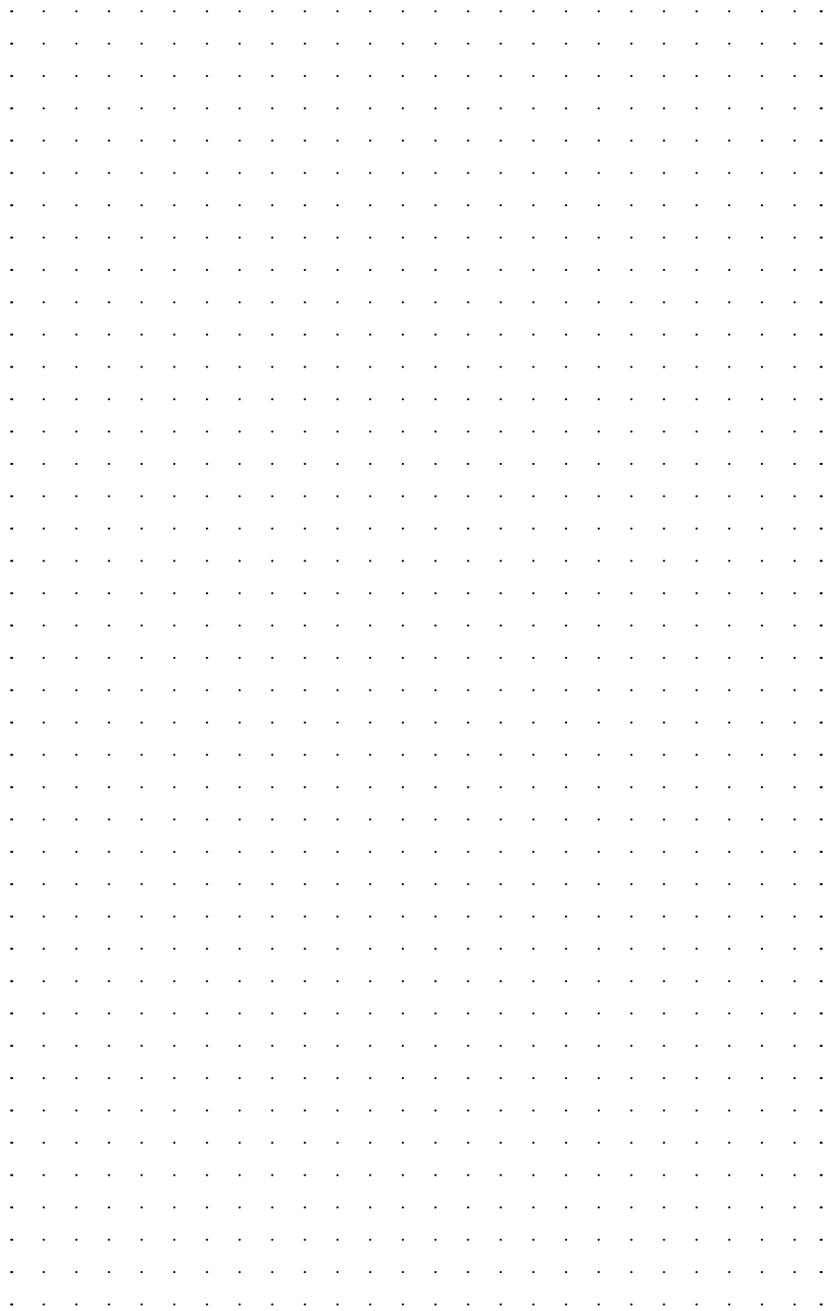
adaptability, flexibility could be represented or projected. Ecosystems, landscapes, and even entire cities were rendered as dynamic, metabolic systems that put into play energy, matter, water, wildlife, people, vehicles, waste, and atmospheres, just for starters. These drawings were instrumental in constructing dynamic new conceptualizations of the world, but now the two- and three-dimensional drawing techniques they utilized have been exhausted. This presentation will explore the metabolic relationships between ecological thinking and design practices as they have evolved over the past twenty years. It will then look forward by identifying a number of time-based projective modeling and scripting techniques, which move beyond simulation and open up new territories for design investigation and discourse.

Ila Berman

Productive Recircuiting

10

As an overview and mapping of the proliferating agendas of contemporary design, this presentation will resituate the concept of urban metabolism in relation to six themes previously defined as new constellations of architectural practice that have emerged as direct byproducts of, or critical responses to, the radical impacts of environmental, technological and demographic transformation. Within the context of rapidly expanding global socio-technological networks, on the one hand, and the inadvertent effects that such forms of territorial colonization have had at the planetary scale, on the other, design has never been more pervasive and powerful, and yet at the same time so vulnerable to the forces influencing its potential and capacity. From the creative recycling of urban wastelands and the re-circuiting of energy-producing infrastructure to responsive architectures and synthetic ecological systems that purport to both shape and dynamically adapt to the populations they support, the reconceptualization of design in accordance with a techno-biotic paradigm and the new trajectories it has spawned, are perhaps the unintentional consequences of thinking the city as a living system of material flows rather than a static collection of discrete artifacts. These have enabled the evolution of new territories and productive fields of operation that are extending the traditional domains of architectural and urban agency.





PIERRE BELANGER

moderator _panel two

territorial transformations

Pierre Bélanger is Associate Professor of Landscape Architecture at the Harvard Graduate School of Design, Co-Director of OPSYS, and Advisor to the US Army Corps of Engineers. As part of the Department of Landscape Architecture and the Advanced Studies Program, he teaches courses on the convergence of ecology, infrastructure and urbanism in the interrelated fields of design, planning and engineering.

He is author of the forthcoming book, *Landscape Infrastructure: Urbanism beyond Engineering* (MIT Press, 2014), and editor of the *Landscape Infrastructures DVD* (2009). Recent publications include *Urbanism beyond Engineering* (Infrastructure Sustainability & Design, 2012), *The Agronomic Landscape* (2011), *Regionalization* (2010), *Redefining Infrastructure* (2010), *Landscape as Infrastructure* (2009).



ILA BERMAN

speaker _panel three

the agency of design

Ila Berman, the new O'Donovan Director of the University of Waterloo School of Architecture and Principal of Scaleshift design, is an architect, theorist, and curator of architecture and urbanism whose research investigates the relationship between culture and the evolution of contemporary material and spatial practices. Dr. Berman's recent work and publications include *URBANbuild local_global* (co-authored with

Mona El Khafif) winner of an AIGA award for the top 50 books of 2009 and a Communication Arts Award of Excellence, *New Constellations New Ecologies*, and her forthcoming book on art and architectural installation: *Expanded Field* based on her exhibition with Douglas Burnham at the Wattis Institute for Contemporary Arts.



NEIL BRENNER

moderator _panel one

metabolic upscaling

Neil Brenner is Professor of Urban Theory at the Harvard Graduate School of Design (GSD) and Director of the Urban Theory Lab-GSD. His writing and teaching focus on the theoretical, conceptual and methodological dimensions of urban questions in relation to modern capitalism, state strategies and sociopolitical struggles. Brenner's most recent book is the edited volume, *Implosions/Explosions: Towards a Study*

of *Planetary Urbanization* (Jovis, 2013). His previous books include, among others, *New State Spaces: Urban Governance and the Rescaling of Statehood* (Oxford University Press, 2004) as well as *Cities for People, not for Profit: Critical Urban Theory and the Right to the City* (co-edited with Peter Marcuse and Margit Mayer; Routledge 2011).

ERLE ELLIS

speaker _panel one

metabolic upscaling

Erle Ellis is Associate Professor of Geography and Environmental Systems and Director of the Laboratory for Anthropogenic Landscape Ecology at the University of Maryland, Baltimore County and Visiting Professor in Landscape Architecture at the Harvard Graduate School of Design. His research investigates the ecology of human landscapes at local to global scales with

the aim of informing sustainable stewardship of the biosphere in the Anthropocene. Early work focused on long-term ecological changes in China's ancient village landscapes. Current work includes global mapping of human ecology and its long-term changes (anthromes), online tools for global synthesis of local knowledge (GLOBE) and tools for mapping landscapes in 3D (Ecosynth).

MATTHEW GANDY

speaker _panel one

metabolic upscaling

Matthew Gandy is Professor of Geography at University College London and was Director of the UCL Urban Laboratory from 2006-11. His publications include *Concrete and clay: reworking nature in New York City* (MIT Press, 2002), *Hydropolis* (Campus, 2006, co-editor) and *Urban Constellations* (Jovis, 2011, editor), along with articles in *New Left Review*, *IJURR*, *Society and Space*, and many

other journals. He is currently completing three book manuscripts: *The fabric of space: water, modernity, and the urban imagination* (for the MIT Press), *Moth* (for the Reaktion animal series), and a co-edited collection *The acoustic city* (for Jovis). From 2013 to 2015 he will be a senior research fellow of the Gerda Henkel Foundation at the University of the Arts, Berlin.

JANE HUTTON

speaker _panel one

metabolic upscaling

Jane Hutton is a landscape architect and Assistant Professor in the Department of Landscape Architecture at the Harvard Graduate School of Design. She is Faculty Director to the Loeb Library Materials Collection and Co-Director of the Energy, Environments, and Design research lab. Her work focuses on the extended

relationships of material practice in landscape architecture, looking at links between the landscapes of production and consumption of common construction materials. Hutton is a founding editor of the journal *Scapegoat: Architecture, Landscape, Political Economy*, and is co-editor of Issues: 01 *Service*, 02 *Materialism*, and 06 *Mexico D.F./NAFTA*.

MITCHELL JOACHIM

speaker _panel three

Dr. Joachim, Co-Founder of Terreform ONE and Associate Professor at NYU. He was formerly an architect at Gehry Partners, and Pei Cobb Freed. He is a TED Senior Fellow and has been awarded fellowships with Moshe Safdie and Martin Society for Sustainability, MIT. He was chosen by Wired magazine for "The Smart List: 15 People the Next President Should Listen To". Rolling Stone magazine honored Mitchell in "The 100 People Who Are Changing America".

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Mitchell won many awards including; AIA New York Urban Design Merit Award, Victor Papanek Social Design Award, Zumtobel Group Award for Sustainability and Humanity, History Channel Inifiniti Award for City of the Future, and Time Magazine Best Invention with MIT Smart Cities Car. Dwell magazine featured him as "The NOW 99" in 2012. He earned a Ph.D. at Massachusetts Institute of Technology, MAUD Harvard University, M.Arch. Columbia University.

TIMOTHY W. LUKE

speaker _panel one

Timothy W. Luke is University Distinguished Professor and Chair in the Department of Political Science in the College of Liberal Arts and Human Sciences at Virginia Polytechnic Institute and State University in Blacksburg, Virginia. He also serves as Program Chair for Government and International Affairs for Virginia Tech's School of Public and International Affairs in the College of Architecture and Urban Studies, and was founding Director of the interdisciplinary

metabolic upscaling

Alliance for Social, Political, Ethical, and Social Thought (ASPECT) doctoral program in the both of these colleges at Virginia Tech. He also is the co-editor of *Fast Capitalism*, and book line editor for Telos Press Publishing. His research interests include modern cultural, social, and political theory as well as the workings of contemporary environmental movements, international politics, museum politics, and material culture.

KIEL MOE

speaker _panel two

Technology in the Department of Architecture at Harvard University Graduate School of Design. He is a Co-Director of the MDesS program, coordinator of the *Energy & Environments* MDesS concentration, and Co-Director of the *Energy, Environments, and Design* research

territorial transformations

lab at the GSD. He is author of *Insulating Modernism* (2014), *Convergence: an Architectural Agenda for Energy* (2013), *Building Systems: Design Technology & Society* (2012), *Thermally Active Surfaces in Architecture* (2010) and *Integrated Design in Contemporary Architecture* (2008).

JASON W. MOORE

speaker _panel one

Jason W. Moore teaches world history in the Department of Sociology, Binghamton University. He writes frequently on the history of capitalism, including the crises of the 21st century. His essays have appeared in *Theory & Society*, *The Journal of Peasant Studies*, *The Journal of Agrarian Change*, *Antipode*, and *Review*, and have been translated into Chinese, Turkish, French, German, Korean, Portuguese, Spanish, and Italian.

metabolic upscaling

He is presently completing *Ecology and the Rise of Capitalism* (University of California Press) and *Ecology and the Accumulation of Capital* (Verso). He is coordinator of the World-Ecology Research Network, and a member of the editorial boards of the *Journal of World-Systems Research*, *The Journal of Agrarian Change*, and *Review*. Many of his essays are available at jasonwmoore.com.

CHRIS REED

speaker _panel three

Chris Reed is the founding principal of Stoss. His innovative, hybridized approach to public space has been recognized internationally, and he has been invited to participate in competitions and installations in the United States, Canada, Europe, Israel, the Middle East, Taiwan, and China. Reed's research interests include the impact of ecological sciences on design thinking, and city-making strategies informed by landscape systems

the agency of design

and dynamics; he is co-editor of an upcoming volume of research and drawing titled *Projective Ecologies*. Reed received a Master in Landscape Architecture from the University of Pennsylvania and an AB in Urban Studies from Harvard College. He is currently Associate Professor in Practice of Landscape Architecture at the Harvard University Graduate School of Design.

SALVADOR RUEDA

speaker _panel two

He is an urban ecologist, founder and director of the Urban Ecology Agency of Barcelona on 2000. He has specialized in analysis and planning of complex systems. He has developed models of occupation and urban metabolism with sustainability criteria. He has designed a new urbanism: the ecological urbanism

territorial transformations

and a new urban cell (the superapple) in order to plan the public space and urban mobility. He has created a new language to read the city and a measuring instrument to calculate the urban complexity. He loves the city but he adores walking on the mountain. His best projects are his four children.

HASHIM SARKIS

moderator _panel three

Hashim Sarkis is the Aga Khan Professor of Landscape Architecture and Urbanism in Muslim Societies and Director of the Aga Khan Program at the GSD. He teaches design studios on architecture, infrastructure and public space. He also teaches courses in the history and theory of architecture.

Sarkis is also a practicing architect. His projects include the new town hall for the city of Byblos, a housing complex for the fishermen of Tyre, a park in downtown Beirut, and several urban and architectural projects.

He has published several books including Circa 1958: Lebanon in the Pictures and Plans

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of Constantinos Doxiadis (Beirut: Dar Annahar, 2003), editor of CASE: Le Corbusier's Venice Hospital (Munich: Prestel, 2001), coeditor with Eric Mumford of Josep Lluís Sert: The Architect of Urban Design (New Haven: Yale University Press, 2008) coeditor with Peter G. Rowe of Projecting Beirut (Munich: Prestel, 1998), and editor of the CASE publication series (GSD/ Prestel). He received his BArch and BFA from the Rhode Island School of Design, his MArch from the GSD, and his PhD in architecture from Harvard University.

LOLA SHEPPARD

speaker _panel two

Lola Sheppard is a founding Partner of Lateral Office, and an Associate Professor at the University of Waterloo in Canada. She received her Bachelor of Architecture from McGill University and a Master of Architecture from Harvard Graduate School of Design. She is a co-director of InfraNet Lab and co-editor of the publication Bracket, including *Bracket [goes Soft]* and *Bracket [at Extremes]*. Lateral Office is an experimental design practice that operates at the intersection of architecture, landscape, and urbanism.

The studio is committed to design as

territorial transformations

a research vehicle to pose and respond to complex, urgent questions in the built environment, engaging in the wider context and climate of a project— social, ecological, or political. Lateral Office is committed to architecture, programs and typologies that responds directly to the demands of the 21st century. Recent work and research focuses on powerful design relationships between public realm, infrastructure, and the environment, particularly in the Canadian North.

