The N_LSO is...

Cecil Balmond, executive director, N_LSO
www.arup.com

Cecil Balmond is an internationally renowned designer, structural engineer, author and Deputy Chairman of the international, multi-disciplinary engineering firm Arup. He is also currently the Paul Philippe Cret Practice Professor of Architecture at PennDesign, Department of Architecture.

He has held several distinguished visiting professorships at leading universities in the United States and Britain: Saarinen Professor at Yale University, Kenzo Tange Visiting Critic at Harvard's School of Design, visiting professor at the London School of Economics, and most recently the Graham Professor at the University of Pennsylvania. He received the Gengo Matsui Prize in 2002, which is the highest recognition for structural engineering given in Japan, and the Charles Jencks Award for Theory in Practice of the Royal Institute of British Architects in 2003. This spring he gave the Felix Candela lectures at the Museum of Modern Art and had an exhibition of his work at the arc en rêve centre d'architecture in Bordeaux, France. He is the author of Informal (Prestel, 2002), Number 9 (Prestel, 1998) and co-authored Serpentine Gallery Pavilion 2002 with Toyo Ito (Telescoweb.com, Japan), and Unfolding with Daniel Liebeskind (NAI, 1997).

Through his provocative designs in collaboration with leading architects and artists and eloquent writings, including Informal (2002) and Number Nine: The Search for the Sigma Code (1998) Balmond has put forward a dynamic and organizational approach to structure that is informed by the sciences of complexity, non-linear organization and emergence. Recognizing that the universe is a constantly changing array of patterns (both random and regular), he also draws on ancient wisdom and non-western mathematical archetypes. Taking structure to be as much a verb as a noun – as structuring, organizing and patterning – Balmond redefines the relationship between structural engineering and architecture beyond the ethos of rationalism, efficiency and optimization, which has characterized not only high-tech design but modern architecture in general. His experimental, constructive and algorithmic methods open a rich territory for design at different scales and in different media and regimes of matter, extending the horizons of both reason and beauty. To test their capabilities he is currently designing an urban master plan for a redevelopment site in London, while at the same time experimenting with rhythmic lighting effects and the generation of music.

David Ruy, director of research, N_LSO
www.ruyklein.com

David Ruy is the director of Ruy Klein, a design office in New York City. Previously at Columbia University GSAPP and The Princeton University School of Architecture, he currently teaches at the University of Pennsylvania School of Design, where he is also the director of research of the Non-Linear Systems Organization (NSO). His research examines design topics at the intersection of architecture, nature, and technology. Awards received include the PA Architecture Design Award, the Lowenfish Award for Design Excellence, and a special citation from the Van Alen Institute for Architecture and Technology.

The work of Ruy Klein has been recently exhibited at The Museum of Modern Art, The Rhode Island School of Design, Project 4 Gallery, and later this year at Artist Space and the Miami Art Museum. The work of the office has been published widely in journals and books including Archiwold, AD, A+U, and Architecture and Science.

Detlef Mertins, executive advisor, N_LSO
www.design.upenn.edu

Detlef Mertins is the chair of the department of architecture at PennDesign. Teaches architectural history, theory and supervises doctoral research. Taught at the University of Toronto (1991-2003) and as a visiting professor at Columbia University, Harvard University, Princeton University and Rice University. Held the Canada Research Chair in Architecture (2001-2003), the Konrad Adenauer Research Prize of the Alexander von Humboldt Foundation and Royal Canadian Society (2003), and a Visiting Scholar Fellowship at the Canadian Centre for Architecture (1998). Books include the English edition of Walter Curt Behrendt, The Victory of the New Building Style, The Presence of Mies, and Metropolitan Mutations: The Architecture of Emerging Public Spaces. Numerous essays in scholarly journals and anthologies, as well as critical writings on contemporary architecture. Research focuses on the history and theory of modernism in architecture, art, philosophy, and urbanism.

N_LSO Senior Researchers

Ferda Kolatan
www.su11.com

Ferda Kolatan is a co-founder of su11 architecture+design in New York City. He was the recipient of the Honor Award for Excellence in Design and the Lucille Smyser Lowenfish Memorial Price from Columbia University. His firm received the Swiss National Culture Award for Art and Design and the ICFF Editors Award for 'Best New Designer' in 2001. His work has been published widely including Archilab's Futurehouse, L'Arca, New New York, Digital Real, The Metapolis Dictionary of Advanced Architecture, AD, Dwell, Le Monde, LA Times and Washington Post. He participated in the Documenta X in Kassel and the Archilab Conference in Orleans in 2001. The project Composite House has been featured in the exhibition Strangely Familiar at the Walker Art Center in 2003. An upcoming exhibition by the Vitra Design Museum will feature a proposal for a house with adaptable skin structures. Ferda Kolatan taught design studios and theory seminars at the University of Pennsylvania, Columbia University, Pratt Institute, Rensselaer Polytechnic Institute, UQAM, RWTH Aachen and the University of British Columbia.

Jenny Sabin
www.cabin-studio.com

Jenny E. Sabin is an architect, artist and founding director of CabinStudio, a research and design studio located in Philadelphia, PA. Before completing her Master of Architecture degree at the University of Pennsylvania, Jenny was a practicing visual artist based in Seattle, Washington USA. Jenny currently teaches design studios and elective seminars within the graduate Department of Architecture at PennDesign. She is a Lead Researcher within the Non-Linear Systems Organization (NSO), a new research group at PennDesign started by Cecil Balmond. Jenny's current research and projects establish relationships between architecture, computation and weaving. Her interest in the materialization and structure of live data sets such as color, light and sound have lead her to investigate the binary mathematical sequence, the Fourier Series. These investigations question and engage the nature of woven frequency space within the greater scope of generative design and fabrication. Jenny recently collaborated with the Advanced Geometry Unit, Arup London on an exhibition at Artists Space titled H_edge. She is the recipient of the AIA Henry Adams first prize medal and the Arthur Spayd Brooke gold medal for distinguished work in architectural design, 2005. She was an American Association of University Women Selected Professions Fellow, 2004-2005 and was recently invited to attend the 2006 Smart Geometry workshop and conference in Cambridge, UK and the Generative Components Summit in Prague, Czech Republic. She is a tutor and speaker at the 2007 Smart Geometry workshop and conference in NY, NY.

N_LSO Fellows

ARANDA / LASCH
Benjamin Aranda and Chris Lasch
www.arandalasch.com

Established in 2003, Aranda/Lasch is a New York-based architectural studio headed by Benjamin Aranda and Chris Lasch. Current projects include built installations, competition proposals, research publications and video works. All are focused on architectural techniques and procedures that expose nested structures found in urban, media and natural phenomena. Using computational code these structures can be understood as simple recipes sometimes referred to as algorithms, which serve as conceptual and geometric fodder in a project's formation. A stated mission of the studio is to engage architecture through the playful and discrete use of mathematics and geometry as a way to deeply appreciate space. Aranda/Lasch were selected as finalists for the MoMA/PS1 Young Architects Program, the Mountain Hut Competition hosted by the US Park Service and took first place for their Las Vegas Gateway competition entry. They are currently working on two exhibitions of their work at Artists Space and Columbia University in New York as well as an exhibition design at the MoMA. Aranda/Lasch's work is the subject of the latest edition of Pamphlet Architecture, titled Tooling, available early 2006.

Daniel Bosia
www.arup.com

Daniel Bosia has extensive experience in Structural Design, Bridge Design and Computer Programming. Joined ARUP in 1998 as a Structural Engineer, Daniel will teach Form and Algorithm at Penn Design, 2005.

Major projects have included the Twist Building at the Battersea Powerstation site, the Royal Ontario Museum, Toronto, and the Serpentine Gallery Pavilion in Hyde Park, London.

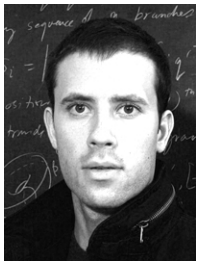
Peter Lloyd Jones
www.uphs.upenn.edu/ime/PJones/index.htm

Peter Lloyd Jones is a cellular and developmental biologist, and Director of the Penn-CMREF center for Pulmonary Arterial Hypertension at the University of Pennsylvania. Following completion of his Ph.D. in Cellular and Genetic Pathology at the University of Cambridge, Peter undertook a post-doctoral fellowship at the Lawrence Berkeley Lab, University of California at Berkeley, studying the role of the extracellular microenvironment on tumor behavior. This was followed by a second fellowship at the University of Toronto in lung biology. In 1998, Peter was appointed Assistant Professor of Pediatrics at the Children's Hospital of Philadelphia where he established an independent NIH-funded research group examining how cell and tissue architecture affects normal and pathological development. In 2000, Peter was recruited to a specialized center of lung research at the University of Colorado where he continued to garner NIH funding to explore the critical role that cellular architecture exerts over the genome. In 2005, he was recruited to the Department of Pathology and Laboratory at the University of Pennsylvania. His laboratory is located in the Institute for Medicine and Engineering, a trans-disciplinary center dedicated to the discovery of new research areas in biology and medicine.

Peter has lectured widely in the U.S. and abroad, and has received numerous awards for his work, published in more than 50 peer-reviewed articles, including 306090. Awards include the Robert Diesenhouse Prize for

Cardiovascular Science, and the 2003 American Physiologic Society Giles Filley Memorial Award for Excellence in Respiratory Medicine. In 2006, Peter began to collaborate with Jenny Sabin at the NSO at PennDesign investigating biological form and its application to contemporary architectural design.

Philip Ording
www.math.columbia.edu



Philip Ording is completing a PhD in mathematics at Columbia University. With support from the National Science Foundation, the American Institute of Mathematics and the Japan Society for the Promotion of Science, he has pursued and presented his research in knot theory at UC Berkely, Osaka University, University of Geneva and Gakushuin University, Tokyo. He is also actively working at the intersection of mathematics, design and the arts. Since 2003 he has been a geometry consultant to Richard Serra and in architecture studios at Columbia University GSAPP, UPenn School of Design and Pratt. In Spring 2006 he and choreographer Elizabeth Higgins will lead a workshop in geometry and movement at Marymount Manhattan College where he is currently an instructor of mathematics.

N_LSO Research Associates

Robert Aish
www.autodesk.com

Robert Aish is a founder member of the SmartGeometry Group who are concerned with the wider educational implications of the teaching and practice of parametric design. In this context, Robert Aish is currently working with a number of leading architectural practices including Foster and Partners, Morphosis, KPF, Grimshaw, NBBJ, ONL and su11 and a number of Schools of Architecture, including the Architectural Association, MIT, Georgia Tech. and the Technical University of Delft.

Hernan Diaz-Alonso
www.xefirotarch.com

Hernan Diaz-Alonso is the principal and founder of Xefirotarch, and practices architecture in Los Angeles and New York. He is a faculty member of Sci-Arc and is a visiting professor at Columbia University and The Institute of Architecture at the University of Applied Arts, in Vienna.

Born in Buenos Aires, Argentina in 1969, he received his architecture degrees from the National University of Rosario, and from Columbia University's AAD Program from which he graduated from with honors and received several design awards. In 1996, he worked as a Designer in the office of Enric Miralles in Barcelona; he also has been senior designer-project architect in Eisenman Architects in New York. (2000-2001).

Helene Furjan
www.design.upenn.edu

Helene Furjan teaches history, theory and design of architecture. Has taught at the Architectural Association (London), UCLA, SCI-Arc, and most recently at Rice University. Scholarship on John Soane and Adolf Loos has been published in Assemblage, Journal of Architecture, AA Files and Grey Room, with essays forthcoming on the C19th interior, format, network theory and contemporary practice. She is co-editor with Sylvia Lavin of the forthcoming publication, The Good, the Bad and the Beautiful: A Primer on Contemporary States of Architecture.

Fotini Markopoulou-Kalamara
www.perimeterinstitute.ca

Fotini Markopoulou-Kalamara, who was born in Greece but now works at the Perimeter Institute in Canada, has played a key role in developing an alternative to string theory, known as loop quantum gravity, or LQG. Like string theory, LQG seeks to fulfill Einstein's dream of unifying quantum theory and general relativity. But unlike string theory, LQG doesn't dwell on extra rolled-up dimensions of space. Instead, it lays out a mathematical system of loops that interact to form "spin networks," the quantum foundations for the realities that each of us perceive. Markopoulou-Kalamara focuses on how spin networks reflecting the partial views of different observers can be combined to produce a shared perception of the universe. LQG predicts that there should be some non-Einsteinian anomalies in how light photons travel, based on their energy — and so the theory's proponents hope that future results from NASA's Gamma-ray Large Area Space Telescope, due for launch in 2007, will show whether they're on the right track.

Simon Greenwold
www.media.mit.edu

Simon Greenwold is an experienced software and hardware developer who designs new ways for humans and computers to interact. He focuses on visual languages and spatial interactions through cutting-edge software and hardware interfaces that move beyond the screen. Simon Greenwold has engaged problems in the development of interactive 3D form generation and the visualization of large, complicated data sets and models. He is currently collaborating with Michael Meredith on the development of new computational tools crossing the disciplines of computer programming, art, and architecture.

Jason Johnson
www.future-cities-lab.net

Jason Johnson is a principal at Future-Cities-Lab LLC, a design research collaborative based in the USA and Athens, Greece. Most recently FCL was awarded a "Second-Prize" for their Seoul Performing Arts Center competition entry in August 2005. Jason is a full-time faculty member at the University of Virginia School of Architecture, leading studios and research seminars in architectural design and physical computing. Jason is also an adjunct lecturer at the University of Pennsylvania. He was born and raised in Canada. He received his Master of Architecture degree from Princeton University in 2001. While at Princeton Mr. Johnson was awarded the Graduate Thesis Prize. He has previously worked with Reiser+Umemoto Architects in New York City.

Yama Karim
www.daniel-libeskind.com

Yama Karim is a Senior Associate Architect for Studio Daniel Libeskind. He received his MArch from Columbia University in 1995 and a BA in Environmental Design from the University of California, Berkeley in 1991. He worked as a senior designer for Reiser-Umemoto-Reiser (RUR) Architecture PC from 1995 to 1999, and also worked for Studio Daniel Libeskind - Berlin between 1996 and 1998. From 1999 to 2003, Mr. Karim worked as Senior Designer at Polshek Partnership Architects in New York. He has worked as a project architect for Studio Libeskind - New York, since May 2003, when the Studio moved its headquarters to New York City. Mr. Karim has been the Project Architect for the Warsaw tower, Singapore housing, Hummingbird tower in Toronto, Monaco extension, NCAC in Boston, the Fiera Milano redevelopment project, and the Freedom Tower collaboration with SOM, as well as Team Leader for the WTC Master Plan development.

Michael Meredith
www.gsd.harvard.edu

Michael Meredith is Assistant Professor of Architecture at the Harvard University Graduate School of Design. He received his BArch from Syracuse, his MArch with distinction from the GSD and the Frederick Sheldon Traveling Fellowship from Harvard University. In 2000, he was awarded the Muschenheim Fellowship from the University of Michigan, where he taught in 2000-2001. From 2001 he was an assistant professor of architecture at the University of Toronto Faculty of Architecture, Landscape and Design–where he was a co-recipient of a Canadian Foundation for Innovation grant–before joining the GSD faculty in 2004. His professional practice engages interdisciplinary discourses, ranging from art to technology, producing a spectrum of design work which includes furniture, products, sound, speculative architecture projects and residences in New York, Ontario, Texas, and California. Recently he was a finalist for the design of the Pentagon 9-11 memorial and the PS1/MoMA Young Architects competition.

Ciro Najle
www.aap.cornell.edu

Ciro Najle teaches architecture at Cornell University. He has previously taught at Columbia University, the Berlage Institute and the University of Buenos Aires. Since 1991, he practices in several associations in Buenos Aires, New York and London, where he resides. His publications include theoretical essays and projects published in After the Sprawl, Oris, Architectural World, Egg Magazine, the introduction to the 2G FOA Monograph, the editing, design and research of the Tokyo Bay Experiment and of the forthcoming "Landscape Urbanism: A Manual for a Machinic Landscape". Throughout his professional and academic experience he has moved across several fields of investigation, in search for expanding the limits of the practice and exploring methods of collaboration with other fields of expertise.

Ben Nicholson
www.saic.edu

Ben Nicholson teaches architecture at The School of the Art Institute of Chicago. Throughout his body of work, Nicholson has questioned and rearticulated the inherent meanings within architecture. He creates a critical inquiry that exposes the confluence of systems and desires at work within architecture and Western society. Some of his most notable projects include the Appliance House (MIT 1990) and Loaf House (1997, CD-Rom from renaissancesociety.com). As part of his long-standing interest in American culture, he contributed to Hartmut Bitomsky's documentary film B-52 (2001). His recent writing and design projects include The Hidden Geometric Pavement in Michelangelo's Laurentian Library, a book that muses over the nature of number, geometry and the structure of knowledge, and The World Who Wants It?, a satire on Western method.

Heather Roberge
www.gnuform.com

Heather Roberge received a Bachelor of Science in Architecture and a Master of Architecture from Ohio State University where she graduated with honors. She trained in the offices of Peter Eisenman, Architecture Research Office, and Davis Brody. As project designer for Architecture Research Office, she worked on the U.S. Armed Forces Recruiting Station in Times Square and the Soho loft. Both projects earned design awards from The American Institute of Architects. Ms. Roberge has taught design studios at Rensselaer Polytechnic Institute, Pratt Institute, and University of California Los Angeles. She is currently on faculty at UCLA where she teaches design studio and is director of Jump-Start, a summer career discovery program.

Rhett Russo
www.design.upenn.edu

Teaches first year graduate design studio and coordinates the first year of visual studies. Was a visiting critic at Pratt Institute, Cornell University, and adjunct professor at Columbia University Graduate School of Planning and Preservation. Served as the first year design coordinator at Pratt institute from 2000 - 2001. He is the founder of OrangeHorse, a New York based design and research initiative. The recipient of the SOM Fellowship (1994), The McKim Award, (1995) The Van Alen Institute Dinkeloo Fellow at The American Academy in Rome, researching the work of Giovanni Michelucci (1998) and The Young Architect's Award (1999) Published projects include, *Second Nature*. (2001) and *Metropolis, The Future is Now*. (2001).

Marcelo Spina
www.p-a-t-t-e-r-n-s.net

Marcelo Spina is the founder and principal of PATTERNS, a Design Research Architectural Practice based in Los Angeles, USA and Argentina. PATTERNS aims to the manufacturing of artificially singular environments characterized by their full proximity and intimacy with the systems and forces that influence and rhythm everyday material life. Marcelo Spina was born in Rosario, Argentina in 1970. He received his Degree in Architecture from the National University of Rosario, Argentina and from Columbia University in New York where he graduated from the AAD Program with honors and was the recipient of several design awards. Recently completed projects include Land.Tiles, a micro temporary landscape installation in Los Angeles and Snake-Rice, an outdoor sculpture in Icheon, South Korea. Current projects include a Weekend House in the outskirts of Sydney, Australia and a Family Residence in Rosario, Argentina, which is scheduled to start construction in 2004.

Margaret Wertheim
www.theiff.org

Margaret Wertheim is the founder and director of the Institute For Figuring, an organization devoted to enhancing the public understanding of figures and figuring techniques. Based in Los Angeles, the Institute puts on lectures and exhibitions, publishes books, and hosts a website about the aesthetic dimensions of science, mathematics and the technical arts. Margaret is an internationally noted science writer and commentator, and the author of several books about the cultural history of physics, including *Pythagoras' Trousers* a history of the relationship between physics and religion, and *The Pearly Gates of Cyberspace: A History of Space from Dante to the Internet*. She is currently working on the third volume in this trilogy, which uses the work of 'outsider scientist' James Carter as the basis for an exploration of the role of imagination in theoretical physics. Carter's idiosyncratic science was the subject of an exhibition Wertheim curated in 2002 at the Santa Monica Museum of Art. Margaret has a BSc majoring in pure and applied physics (University of Queensland), and a BA majoring in mathematics and computer science (Sydney University). She is a contributor to the *New York Times* Science Section and an Op-Ed contributor for the *Los Angeles Times*. She also writes the "Quark Soup" column for the *LA Weekly* (sister paper to the *Village Voice*) and is a contributing editor to *Cabinet*, a leading arts and culture quarterly. Margaret has contributed to more than a dozen anthologies including *Architecture of Fear* (Princeton University Press) and *Prefiguring Cyberspace* (MIT Press). She has lectured widely at universities and colleges across America and abroad - including Harvard, MIT, Oxford University, University of Oslo, University of Sydney, and Princeton Theological Seminary. Margaret has been a keynote speaker at the Royal Australian Institute of Architects, the International Design Conference Aspen, the "Sacred Space" conference at the Ecclesiastical Academy in Tutzing, Germany, and many others.

Mark Yim
www.me.upenn.edu

Mark Yim joined the Department of Mechanical Engineering and Applied Mechanics at U Penn in the fall of 2004 as Associate Professor and Gabel Family Term Junior Professor. Prior to this, he was a Principal Scientist at the Palo Alto Research Center (formerly Xerox PARC) where he established a group developing modular self-reconfigurable robots. These robots can change their shape to adapt to new tasks. While the applications of these systems can be very broad, he is focusing on high mobility mechanisms, urban search and rescue, education, and reconfiguring spacecraft. His other research interests include biologically inspired mechanims, haptics for virtual reality, flying robots and meso-scale MEMs devices. Honors include induction as a World Technology Network Fellow; IEEE Robotics and Automation Distinguished Lecturer, and induction to MIT's Technology Review TR100 in 1999. He has over 30 patents issued (perhaps most prominent are ones related to the Sony PS2 and Microsoft

Xbox joypad vibration control) and over 50 publications. His work has received a significant amount of popular media coverage both in the US, Asia and Europe.