Department of Architecture

The MIT Department of Architecture incorporates outstanding research and teaching programs in each of five discipline groups: Architectural Design (AD); Building Technology (BT); Design and Computation (COMP); History, Theory, and Criticism (HTC); and Art, Culture and Technology (ACT). Following its merger with the Center for Advanced Visual Studies in 2010, ACT became a more autonomous entity within the School of Architecture and Planning; its academic component, however, including its subject offerings, is still under the administration of the Department of Architecture.

Graduate degrees offered are master of architecture (MArch); master of science in architecture studies (SMArchS); master of science in art, culture, and technology (SMACT); and doctor of philosophy (PhD) with concentrations in building technology, design and computation, or history, theory, and criticism of architecture and art.

Undergraduates can earn a bachelor of science with concentrations in one of the five departmental discipline streams (architectural design; visual arts; building technology; history, theory, and criticism of architecture and art; or design and computation) and can minor in architecture and history of art and architecture. Effective September 1, 2011, undergraduate degrees carried new names: bachelor of science in architecture (BSA) and bachelor of science in architecture studies (BSAS).

Personnel

Leslie Norford continued to serve as associate department head, Andrew Scott as MArch program director, J. Meejin Yoon as undergraduate program director, Arindam Dutta as SMArchS program director, and Takehiko Nagakura as chair of the Committee on Graduate Students. Together with the discipline group directors, they served as a cabinet to meet with the department head in an advisory and coordinating capacity.

Alexander D'Hooghe and Gediminas Urbonas were granted tenure effective July 1, 2012.

Three new faculty members joined the department: Ellen Renée Green as associate professor of art, culture, and technology (with tenure), effective July 1, 2011; Christoph Reinhart as associate professor of building technology (with tenure), effective January 1, 2012; and Azra Aksamija as assistant professor of art, culture, and technology, effective September 1, 2011.

Two searches concluded with the appointments of Anton Garcia-Abril as professor of architecture and Joel Lamere as assistant professor of architecture, both effective July 1, 2012. A third search in architectural design also concluded, pending approval of the finalist.

The Belluschi Lectureship for rising young professionals was established in spring 2012 in the name of former dean Pietro Belluschi; the first holder will be Brandon Clifford, effective July 1, 2012, for a period of three years. Technical instructor Justin Lavallee joined the department in a newly established administrative staff position as manager of the fabrication laboratory.

The information below is organized by discipline and program group and includes mention of various academic activities, followed by individual topics that cross discipline areas.

Architectural Design

Program Notes

The core program for the first three semesters continued to undergo fine-tuning. A new required subject for incoming MArch students, taught during the Independent Activities Period (IAP), was dedicated to fabrication using the department's newly acquired state-of-the-art equipment and intended to introduce the importance of "making" as a foundation for the transformation of the building industry, the interrogation of the means and methods of fabrication, and the production of innovative techniques of construction. The top designs from this class were chosen through a competition for funding and installation on Eastman Court this summer.

Several studios and workshops benefited from international support and collaboration. One example is the Barcelona Studio, conducted by Andrew Scott with participation by Nader Tehrani, a collaborative effort with the city of Barcelona and the Institute for Advanced Architecture in Catalonia. Other classes traveled to Guizhou, China (a trip co-sponsored by the MIT Media Lab and Ohio State University); post-tsunami Tohoku, Japan; Venice, Italy; Riyadh, Saudi Arabia; and San Cayetano, El Salvador.

The fall lecture series organized by D'Hooghe hosted Pierre Belanger, Dan and Marie Adams, Robert Siegel, Jan De Vylder, Chris Lee, and Robert Levit. The spring series organized by Sarah Hirschman hosted Tim Love and Kairos Shen, Jianfei Zhu, Marcel Smets, John McMorrough, and Dora Epstein Jones. In addition, "BOOM: A New Development Roundtable" hosted Rodolphe El Khoury, Matthias Hollwich, Charles Renfro, and Joel Sanders.

Accreditation Update

The National Architectural Accreditation Board (NAAB) formally granted the maximum six-year term of accreditation of the professional MArch degree following its site visit in 2009, with the stipulation that a focused evaluation be submitted in two years to look at two causes of concern (the quality of unfinished thesis projects and consistency of learning objectives across three semesters of choice studios) and at progress made in those areas. The focused evaluation was submitted in June 2011. The NAAB team responded in October 2011 that the concerns under review were beyond the scope of its charge; therefore, it recommended that a full review of these concerns be deferred until the next scheduled site visit in 2015.

Admissions

Students in the MArch degree program are admitted at two levels: Level I for those who come from undergraduate backgrounds in other areas of study and Level II for those who come from undergraduate programs in architecture and thus receive one year of advanced standing in the 3.5-year graduate program. In spring 2012, there were 517 applicants; 69 were admitted, with 27 targeted for Level I by the committees (resulting in 32 enrolled) and three targeted for Level II (resulting in two enrolled). (These figures reflect raw data as of April 2012. Actual enrollment data as detailed in the annual Yearly Enrollment Report released in October 2012 can vary slightly.)

Faculty Activities and Achievements

AD faculty members who also practice as architects include Julian Beinart, Yung Ho Chang, Michael Dennis, Alexander D'Hooghe, Philip Freelon, Mark Goulthorpe, Shun Kanda, Sheila Kennedy, Ana Miljacki, William O'Brien, Adèle Naudé Santos, Andrew Scott, Nader Tehrani, and J. Meejin Yoon. Faculty members lectured widely, entered and placed in competitions, conducted research, and served as guest critics and jurors. They were well represented in the architecture and popular media, as well as in exhibitions worldwide. Selected individual achievements are as follows.

Freelon was appointed by president Barack Obama to the US Commission on Fine Arts. His firm was the subject of an exhibition in the MIT Wolk Gallery in spring 2012.

Reinhard Goethert received an MIT International Science and Technology Initiatives (MISTI)/China Global Seed Fund grant for his proposal "Ecological Smart-Slope Urban Development."

Goulthorpe won the Tomorrow Awards for HypoSurface and was a finalist in the MassChallenge Zero+ Thermoplastic Housing competition. He was co-chair of the 2012 Association of Collegiate Schools of Architecture annual conference, which was hosted on campus in March.

Kennedy is principal of KVA Matx, an interdisciplinary design firm whose winning entry for the International BauAustellung was "SOFT HOUSE," a row housing project for Hamburg. The *Geneva Global Journal* selected the firm's Portable Light Project as one of the top nonprofit initiatives worldwide. Building projects at the University of Pennsylvania Law School and the East 34th Street Public Ferry Terminal Building in Manhattan opened in 2012.

Miljacki received an award from the *Journal of Architectural Education*, published by the Association of Collegiate Schools of Architecture, for the best scholarly article submitted in 2011. Her publications included contributions to three edited books.

O'Brien won the 2012 Rome Prize in Architecture, which will lead to a yearlong leave at the American Academy in Rome beginning in September 2012. He won honorable mention in the Association of Collegiate Schools of Architecture Faculty Design Awards category for his project "Twins: Houses in Five Parts."

Tehrani's Hinman Research Building at the Georgia Institute of Technology won numerous awards, and he received an Honor Award for Unbuilt Work from the American Institute of Architects' NY Design Awards for his project "Dortoir Familial." His "Urban Folly" installation was part of the Gwangju Design Biennale in South Korea.

Skylar Tibbits won a 2012 TED Senior Fellowship. His commissions and exhibitions included *BioMolecular Self-Assembly* at TEDGlobal 2012, *The Self-Assembly Line* for TED 2012, and *Coding [Global] Strands* for the GE and SEED Media Group.

Yoon's firm Howeler + Yoon Architecture won a Boston Society of Architects Honor Award and an *Architect Magazine* Annual Design Review Award for its SkyCourts Exhibition Hall at the International Intangible Cultural Heritage Exposition in Chengdu, China. The firm also celebrated the opening of BSA Space, its design for the new headquarters of the Boston Society of Architects.

Building Technology

Program Notes

The scope of research and teaching interests of the group has expanded in recent years. While traditionally the group concentrated its efforts on the science and technology of buildings and their systems, the group has established new research interests in urban-scale work, comprehensive life cycle assessment, and workflow design for building performance simulation.

The group successfully completed the design and offering of a number of new subjects during the past academic year, including reviving classes in advanced materials for buildings and ecological construction and introducing a class on sustainable cities. Reinhart redesigned the subject 4.430 Daylighting to include elements of scale model building, measurements, and simulations. John Fernández offered a new class, 4.474/4.475 Design for Sustainable Urban Futures, supported by recent research in the Urban Metabolism Group and open to both undergraduate and graduate students.

Norford is working with electrical engineering and computer science professor Jesus del Alamo and the MIT Center for Educational Computing Initiatives to configure the BT environmental test chamber as an iLab that can be accessed remotely by students at MIT and the Singapore University of Technology and Design (SUTD) as well as others throughout the world. The concept involves enabling students to run heating, ventilating, and cooling equipment; model the thermal performance of the test room; estimate the thermal comfort of hypothetical occupants; and control equipment in ways that improve efficiency.

Faculty Research

Leon Glicksman and two PhD students carried out studies of a novel natural ventilation design to be used in a new office building in Tokyo due for completion this year. This will be followed by a period of intensive monitoring. In the same building a daylighting technology developed by Marilyne Andersen, formerly of the BT faculty and currently

a professor at École Polytechnique Fédérale de Lausanne, and a BT student will be installed on several floors. Both systems should lead to substantial energy savings while providing more comfortable interior conditions.

Glicksman is leading a joint research project with professors Lorna Gibson of Materials Science and Engineering and Gang Chen of Mechanical Engineering to develop aerogel insulation panels that are projected to have much higher insulation levels than conventional insulation of the same thickness. Glicksman and BT student Ellann Cohen contributed a chapter on insulation science to *Fundamentals of Materials for Energy and Environmental Sustainability* (Cambridge University Press, 2011).

Reinhart brought with him a National Science Foundation (NSF) contract in the Emerging Frontiers in Research and Innovation (EFRI) program. The project, in the Science in Energy and Environmental Design (SEED) category, is a collaboration with the Harvard School of Public Health and Pennsylvania State University; the goal is to develop an urban modeling platform for energy.

Reinhart and Norford received funding from the MIT Energy Initiative Seed Fund and the United Technology Corporation to expand the urban modeling platform to consider urban micro-climatic effects (urban heat islands), as well as to add a walkability/bikeability analyzer to the emerging tool. The bikeability component is further supported through a small gift from Modern Development Studio, a Boston-based architectural firm working on a sustainable master plan in Chile. The tool will first be taught in a new seminar on modeling urban energy flows in spring 2013.

Reinhart received 50% funding for a PhD student from Transsolar Climate Engineering, a leading German green building consulting firm, to advance work on an urban daylighting module.

In the 2011–2012 academic year, Reinhart co-authored four peer-reviewed journal articles and nine conference proceedings. Since joining the faculty in January he has given five invited presentations to industry and academia, and he gave the keynote speech at the IBPSA Canada biannual building simulation (eSim) conference in May 2012 in Halifax, Canada.

Fernández and Norford continued work on an NSF-sponsored project, also in the EFRI-SEED program, to determine appropriate roles for advanced building operations that can provide services to electric utilities, which in turn provide "smart grid" communications. Norford's team is modeling the control of heating/ventilation/air conditioning (HVAC) systems, rooftop photovoltaic arrays, and battery charging in electric or plug-in hybrid electric vehicles. Fernández's team focuses on neighborhood-scale energy flows and building interactions.

The Guastavino Project, led by John Ochsendorf, received a $350,000 grant from the National Endowment for the Humanities to create a public exhibition of the tile-vaulted ceilings of the Spanish-American Guastavino family. The exhibition will be shown in Boston, Washington, DC, and New York City from 2012–2014. Ochsendorf served as

the 2011–2012 McMurrin distinguished professor at the University of Utah, where he taught a two-day design-build workshop for the School of Architecture. In addition, he was one of two MIT faculty members invited to present at the National Academy of Engineering's Frontiers of Engineering conference in September 2011.

Fernández is lead faculty for the Sustainable Built Environment Grand Challenge of the International Design Center, the research organization of SUTD. He coordinates all research in this area and heads up a research group investigating the urban metabolism of rapidly growing cities in Asia and beyond. He also leads the curriculum development effort for the Architecture and Sustainable Design "pillar" of SUTD, which involves the delivery of class material to newly hired SUTD faculty.

History, Theory, and Criticism

Program Notes

HTC maintained its high ranking in the National Research Council doctoral survey, and despite financial competition by peer institutions it sustained a cohort of doctoral students by admitting five PhD candidates. A search was approved for a tenure-track position in architectural history to replace David Friedman, who announced his retirement effective June 30, 2013.

The exchange program between HTC and Istituto Universitario di Architettura di Venezia's Fondazione Scuola di Studi Avanzati-Venezia is in its ninth year. Likely due to financial constraints, no students were able to come to MIT this year. The program hosted two visiting scholars from the MIT-Singapore Alliance, Keng Hua Chong and Kang Shua Yeo. Mark Jarzombek and Arindam Dutta served as their mentors and also traveled to Singapore as part of MIT's mission to help develop a design curriculum at SUTD. Caroline Jones met with them as well about PhD programs within a design school, for which HTC serves as a model.

HTC's contribution to the undergraduate program was strengthened by the new subject 4.606 Visual Perception and Art, taught by Jones in collaboration with a neuroscientist. A new MArch core elective, 4.647 Technopolitics, was taught by Jones and Dutta. The program awarded three PhD and five SMArchS degrees in 2011–2012. PhD students continue to perform at a high level with respect to achieving outside funding: seven students gained $129,605 in pre-doctoral research support.

Admissions

In spring 2012, HTC received 82 applications (63 PhD and 19 SMArchS). Faculty ranked 12 PhD applicants into three lines; of the nine candidates admitted, five accepted admission for fall 2012. Of the four SMArchS applicants admitted, one accepted admission.

Program Activities

The HTC Forum theme in the fall was "After the Fact." The speakers were Andrew Herscher, Hans Haacke, Jeffrey Schnapp, and Amelia Jones. The spring theme was "Vectors of Vision," with speakers Glenn Adamson (cosponsored by the department), Jane Rendell, and Mark Dorrian. An informal forum event was held to debate Hal Foster's new book, *The Art-Architecture Complex*. The "research-in-progress" conference consisted of two sets of talks held on March 11, with Niko Vicario and Rebecca Uchill, and on April 15 with Michael Kubo and Ana María León Crespo. Crespo and Christopher Ketcham represented HTC at the New England Society of Architectural Historians graduate symposium.

Selected Faculty Activities and Achievements

HTC faculty conducted research travel and lectured worldwide. Their work was well represented in essays, book chapters, and exhibition catalogues.

Stanford Anderson launched his book *Aalto and America* (Yale University Press), co-edited with Gail Fenske and David Fixler, at a special reception hosted at the Finnish ambassador's residence in New York City. Anderson was named advisory professor at Tongji University, Shanghai.

Dutta's experimental collective "Aggregate" published *Governing by Design: Architecture, Economy, and Politics in the Twentieth Century* (University of Pittsburgh Press), and he contributed to the Victoria & Albert Museum's postmodernism exhibition catalogue.

Jones was codirector with Peter Galison of a two-part Social Science Research Council dissertation workshop in Pacific Grove, CA, and Philadelphia. She curated the List Visual Arts Center exhibition *Hans Haacke 1967* and edited the exhibition catalog.

Kristel Smentek was named an external faculty fellow at the Susan and Donald Newhouse Center for the Humanities at Wellesley College.

Selected activities of Nasser Rabbat and James Wescoat are included below in the section on the Aga Khan Program for Islamic Architecture.

MIT Program in Art, Culture and Technology

For program notes and other information on the MIT Program in Art, Culture and Technology, refer to ACT's separate report to the president.

Design and Computation

Program Notes

George Stiny led the organizing efforts for the Mitchell Symposium (November 11–12) to honor professor and former dean William J. Mitchell and discuss his career and legacy in design, education, and research. All COMP faculty members participated in panel discussions. Nagakura and Terry Knight offered the new 4.S52 Rethinking BIM workshop (funded by CO Architects with technical support from Autodesk), an initiative

intended to bridge research activities with the design and technology industry. The theme of the group's fall lecture series was "Design & Cybernetics"; speakers were Ayodh Kamath, Alise Upitis, Ted Krueger, Paul Pangaro, and Jeff Lieberman. In the spring the theme was "Design-in Perception," with speakers Arnold Berleant, Margaret Livingston, John Peponis, Madeline Schwartz, and Graham Jones.

Selected Faculty Achievements

Takehiko Nagakura's computer graphics film *Tatlin's Tower for the Third International* was included in a traveling exhibition, *Building the Revolution: Soviet Art and Architecture 1915–1935*, organized by the Royal Academy of Arts, London. His film *Altstetten Church* was included in the exhibition *City Visions*, organized by the Urban Center in Turin, Italy. Lawrence Sass continued his studies in prototyping and visualization with multiyear research funding support from SUTD (2010–2019) and gave invited lectures at the University of Texas at Austin and the University of Manitoba.

Master of Science in Architecture Studies Program

The SMArchS is an advanced degree that reflects the idea that architecture and its ancillary disciplines are not just professional pursuits but also fields of knowledge and inquiry. Over the years, the program has been organized into five areas of study representing disciplines taught within the department: architecture and urbanism; building technology; design and computation; history, theory, and criticism; and the Aga Khan Program for Islamic Architecture. The challenge is always to see if the program can be more than the sum of its parts, that is, if the course of study undergone by students can become more than highly individualized, sometimes idiosyncratic, inquiries and become instead a more mature comprehension of the discipline or profession in which they work. Led by Dutta as program director, the SMArchS committee took multiple steps to realize that outcome.

A new AD stream was launched this year, with a new cadre of three students joining students from the other five streams in academic year 2013. The design stream received the highest number of applications among all streams, reflecting strong interest by prospective students. Representing as it does the crossroads for all of the disciplines, it is hoped that the design stream will provide a "synthesizing" role for the other fields in the future, allowing for more cross-disciplinary initiatives.

The shortfall in space provided for SMArchS students was addressed in the fall. While a temporary solution was found, in the long run space will be the primary concern if the program is to acquire a unified identity.

The thesis structure was substantially revamped and formalized to allow more cross-disciplinary input, the beginning of a process that is expected to be ongoing.

The program will focus on the following goals next year: permanent space allocation for SMArchS students, projects that emphasize SMArchS as a cohesive identity, coordination of a SMArchS lecture series, strengthening the program's presence on the web, continued coordination of thesis reviews with external reviewers, and an allocated budget to cover program-specific activities.

Overall, SMArchS admissions results in spring 2012 were 308 applications, 45 admitted, 28 targeted, and 25 enrolled.

Undergraduate Program

The undergraduate program is a pre-professional degree program that prepares students for a master of architecture professional degree program. Design education focuses on studios, supplemented by coursework in building technology; computation; history, theory, and criticism; and the visual arts. Undergraduate majors may choose to focus on these disciplines in lieu of architectural design, following established curricular requirements. Yoon, Norford (in his role as undergraduate officer), and administrator for academic programs Renée Caso continued to support and strengthen the undergraduate experience. Faculty members who served as undergraduate advisors, in addition to Norford and Yoon, were Fernández, Frank Adler, Glicksman, Goulthorpe, Knight, O'Brien, Ochsendorf, Sass, Smentek, Anne Spirn, Stiny, Urbonas, and Wescoat.

The Course 4 degree name bachelor of science in art and design was changed to bachelor of science in architecture, starting with students who graduated in 2012. As recommended by the Department of Architecture, the Course 4B degree name bachelor of science was changed to bachelor of science in architectural studies.

The program received a grant from the d'Arbeloff Fund for Excellence in Education to develop a new subject, 4.110J/MAS 330J Integrative Design across Disciplines, Scales, and Problem Contexts, to serve undergraduates across the Institute. It will be taught for the first time in spring 2013.

Undergraduates continued to participate in a variety of international experiences offered by the department. The department welcomed one student from the Technical University of Delft and two from Hong Kong University as part of ongoing exchange programs. MIT senior Duong Huynh spent the fall term studying architectural design at Hong Kong University.

The Department of Architecture and the Department of Urban Studies and Planning (DUSP) jointly offered "Discover Architecture + Planning" at the Institute's freshman pre-orientation program in August. Ten freshmen participated.

The department participated in the Minority Introduction to Engineering and Science (MITES) program again in the summer of 2011 by offering an architecture design component.

Six seniors completed theses this spring reflecting a range of areas of concentration.

Eleven sophomores entered the department in 2011–2012, joining 12 juniors and 19 seniors to bring the total number of undergraduate majors to 42.

Aga Khan Program for Islamic Architecture

The Aga Khan Program for Islamic Architecture (AKPIA) at MIT, established in 1979, is a leading program in the study of architecture in the Islamic world. Its outreach activities include a lecture series, a travel grant program open to all students in the School of Architecture and Planning, and a visiting postdoctoral program. With director Nasser Rabbat on leave, James Wescoat served as acting director. In 2011–2012, the program numbered five PhD and six SMArchS students.

Program Activities

AKPIA admitted one new PhD student and three new SMArchS students for fall 2012 and graduated three SMArchS students in 2011–2012. The program hosted four postdoctoral fellows (Luis Jose Garcia Pulido, Riyaz Latif, Samir Mahmoud, and Ipek Tureli), each of whom presented a public lecture. The program celebrated its 30th anniversary reunion with a special conference. Hala Nassar and Hafiz Sherali gave talks in the fall lecture series. The spring lecture series included Sibel Bozdogan, Jonathan Noble, and Makram el Kadi and Ziad Jamaleddine, as well as presentations by travel grant recipients Shiben Banerji, Hanna Rutkouskaya, Stephen Kennedy, and Alice Shay.

Faculty Activities

Rabbat spent his leave as a fellow at the Radcliffe Institute for Advanced Study. His book *Mamluk History Through Architecture: Building, Culture, and Politics in Mamluk Egypt and Syria* received the 2011 British-Kuwait Friendship Society Prize in Middle Eastern Studies. He was sought after as an intellectual interpreter of the urban contexts for the Arab Spring. Wescoat presented the Annemarie Schimmel Memorial Lecture at the Metropolitan Museum of Art in November and conducted the Landscape Heritage Workshop in collaboration with the Aga Khan Trust for Culture in New Delhi. He contributed to the post-tsunami workshop in Japan and continued his work on water-related issues.

Across the Department

Department of Architecture Enrollments

As of October 2011, Course 4 counted a total of 281 students: 42 undergraduates and 239 graduate students. Graduate students were enrolled as follows: 111 MArch, 73 SMArchS, 8 SMBT, 13 SMVisS or SMACT, 38 resident PhD, and 14 nonresident PhD. (Note that Center for Real Estate students are no longer counted in the Department of Architecture in the Institute's annual Yearly Enrollment Report.)

Lectures

The fall department guest speakers were Kurt Forster, Joshua Prince-Ramus, Gregg Pasquarelli, Yung Ho Chang, Jorge Silvetti, Sarah Goldhagen, Fares el-Dahdah, and Thomas Phifer. In the spring speakers were Mark West, Maria Alessandra Segantini, Ziad Jamaleddine and Makram el Kadi, Glenn Adamson (cosponsored by HTC), and Giuseppe Lignano and Ada Tolla. Alejandro Aravena presented the 18th Pietro Belluschi Lecture. Janine Benyus presented the 6th Goldstein Architecture, Engineering, and Science Lecture. Manuel Aires Mateus presented the 23rd Schein Lecture. Discipline group lectures are mentioned in the relevant sections above.

Publications and Exhibitions

Thresholds, edited and produced by students, is a journal noted for developing diverse architectural themes in each issue. The theme for issue number 40, edited by Jonathan Crisman, was "socio-." Sarah Hirschman joined the staff as coordinator of publications and exhibitions to help develop strategies for department publications and to oversee installations in the Keller Gallery. She edited *Testing to Failure*, a biennial department yearbook for 2009–2011 with contributions by students, faculty, and friends of the department, including eight original essays.

The Keller Gallery opened in the fall, with the intention of showcasing a steady stream of work by students, faculty, alumni, and others. Exhibitions in 2011–2012 were *Trans Trash* (September), *Research in Lightweight Concrete* (October), *Rule* (work by Toronto's Khoury Levit Fong; November), *The Making of Things* (work by Ali Tayar; December–January), *The New Normal* (work from the IAP Fab Lab; February), *Robin Boyd: Walsh Street House* (March), *Queer | Body | Architecture* (April), *Waterworks—Photographs by Carole Starr Schein* (May), and *Platforms for Exchange* (work by Core 2 MArch students; June).

Nader Tehrani
Department Head