



MASTERS OF TALL BUILDINGS AND VERTICAL URBANISM

(M.TBVU)

ILLINOIS INSTITUTE OF TECHNOLOGY
College of Architecture



A NEW URBAN FUTURE

The Illinois Institute of Technology (IIT) and the Council on Tall Buildings and Urban Habitat (CTBUH) are pleased to announce the Masters of Tall Buildings and Vertical Urbanism (M.TBVU); the world’s first multi-disciplinary advanced degree focused specifically on the building type that more than any other, in an age of rapid urbanization, holds the key to sustainable existence for humanity on this planet – the high rise. This new, design- and research-based program brings together students and professionals from architecture, real estate, engineering, urban design, construction management, finance, and other backgrounds in a unique learning environment built to foster interdisciplinary research and experience. Students will work with a remarkable roster of industry leaders to discover innovative approaches to vertical density and city-making.

“Future generations must design responsive, high-density cities that support both human and environmental health.”

HIS EXCELLENCY, MOHAMED ALI ALABBAR
Founder and Chairman, Emaar Properties, Dubai

ADVISORY AND TEACHING PANEL MEMBER;
 SEE PAGE 10

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Students from the Fall 2023 MTBVU design studio with the program’s instructors and invited critics at the final review held on the upper floor of Crown Hall at IIT.

DEAN’S STATEMENT

With more than a million people projected to move into cities every week for the next 25 years – and in the face of major climate change – there is perhaps no greater challenge for humanity than creating humane, equitable, exciting, healthy urban centers. And there is no single building type more important to, or emblematic of, modern cities than skyscrapers. Moreover, there is no school of architecture with a stronger pedigree in tall buildings than Illinois Institute of Technology (IIT). After all, skyscrapers were invented in Chicago, just blocks from our campus. Many structural, formal, and organizational innovations in tall building design began as projects here at IIT. Our renowned faculty and advisory council enable our students to engage directly with the most influential experts in the field. Our fabrication center, one of the largest in the country, offers hands-on, at-scale project development. And you will study in Crown Hall, one of the most important works of modern architecture in the world (and the only purpose-built architecture school designed by Mies van der Rohe). This is a chance to develop expertise in a subject that is vital to our common future, and to do that in a setting that is unparalleled. Join us!



REED KROLOFF
Dean, IIT College of Architecture

PROGRAM DIRECTOR’S STATEMENT

In order to ensure that cities are places where people can thrive, we must do more than simply increase density. This program looks to position its graduates at the nexus of how future cities develop. We need to integrate tall buildings more thoughtfully into both our urban and social fabrics. To accomplish this, we need to create a new cohort of professionals trained specifically to engage in the sustainable design, construction, operation, and management of tall buildings in the context of a comprehensive understanding of cities – a sustainable, vertical urbanism. Our new Masters program brings together the great strengths and diversity of Illinois Institute of Technology and the global Council on Tall Buildings and Urban Habitat – an unparalleled combination of academic and professional resources. CTBUH has a unique, 50+ year history of research, documentation, and advocacy; the only organization of its type in the world. Our 2 million+ members include virtually every world leader in the realm of tall buildings, from architects and engineers to developers, financiers, and public servants. Together, we offer students an opportunity that is simply not available elsewhere. As a graduate of this program, you will enter the field with a unique set of knowledge, skills, and connections, prepared to create positive, sustainable outcomes for future societies.

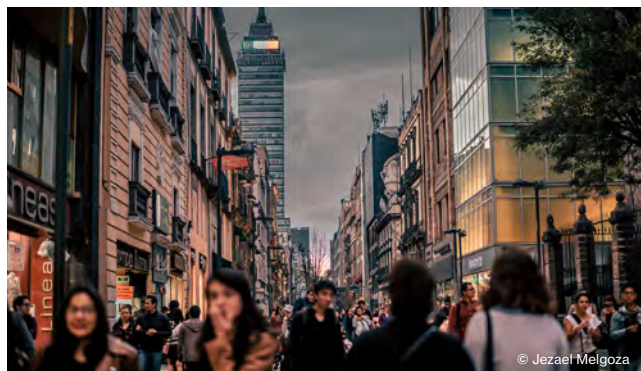


DR. ANTONY WOOD
Director, M.TBVU, IIT; President, CTBUH

PROGRAM HIGHLIGHTS



Led by Tengku Dato' Ab Aziz Tengku Mahmud, CEO of PNB, students toured the construction site of Merdeka 118, the second tallest building in the world, as part of the MTBVU international trip to Singapore and Kuala Lumpur, partially funded by scholarships.



© Jezael Melgoza

HELP DETERMINE THE FUTURE OF HUMANITY ON THIS PLANET

This program seeks to explore nothing less than the most sustainable solutions for an urban future, in the increasing global emergencies of climate change; health and wellness; population growth; and mass urbanization. See how the constituent courses contribute to this on page 6.



© Austin Neill

EXPERIENCE THE LEARNING LABS OF CHICAGO & IIT

Chicago – and IIT – were the first crucibles for the skyscraper, and continue to be driving forces for the evolution of cities. Study in, and experience, the high-rise learning laboratories that are Chicago and the home of Mies van der Rohe: IIT (see page 14).



WORK IN A MULTIDISCIPLINARY SETTING

The program brings together students and early-career professionals of myriad backgrounds, to work with experts of all disciplines in multi-perspective collaboration, to determine the most viable and sustainable way forward for cities (see page 10).



CAREER OPPORTUNITIES

Many of the renowned firms supporting this program offer a paid one-year internship, pending an application process, after successful graduation (see page 12), or you can pursue a PhD or career in research (see page 18).



FUNDING AND TRAVEL OPPORTUNITIES

Sponsored programs through CTBUH – as well as potential paid internships – support research, international travel, and other opportunities (see page 16).



BEYOND THE TROPHY BUILDING

The program focuses beyond the tall building as a singular icon, to considering the three-dimensional vertical city as a whole (see past studio outputs on pages 20–27).

PROGRAM PATHWAYS

Please note: Both pathways below can be undertaken in two semesters, two semesters plus a summer, or spread over two years for those continuing to work in industry.

	TWO PATHWAYS	SEMESTER 1: FALL	CREDITS	SEMESTER 2: SPRING	CREDITS	SEMESTER 3: SUMMER	CREDITS	TOTAL CREDITS
TERMINAL DEGREE MASTERS OF TALL BUILDINGS AND VERTICAL URBANISM (M.TBVU)	1: M.TBVU DESIGN PATHWAY The core of the design pathway is the design studio in each semester. The first semester project is often set overseas (see more on page 16).	ARCH 545 Tall Building Design Studio I ARCH 570 Seminar: Talking Tall I ARCH 572 Tall Building Technologies I Approved Elective TOTAL CREDITS:	6 3 3 3 15	ARCH 546 Tall Building Design Studio II ARCH 571 Seminar: Talking Tall II ARCH 573 Tall Building Technologies II Approved Elective TOTAL CREDITS:	6 3 3 3 15			30
	2: M.TBVU RESEARCH PATHWAY Students on the research pathway increasingly focus on a research output as the course progresses, rather than design studio.	ARCH 601 Research Methodologies ARCH 570 Seminar: Talking Tall I ARCH 572 Tall Building Technologies I Approved Elective TOTAL CREDITS:	3 3 3 3 12	ARCH 546 Tall Building Design Studio II ARCH 571 Seminar: Talking Tall II ARCH 573 Tall Building Technologies II TOTAL CREDITS:	6 3 3 12	ARCH 592 Masters Project (Research) TOTAL CREDITS:	6 6	

PROGRAM COURSE DESCRIPTIONS

ARCH 545: TALL BUILDING DESIGN STUDIO I

(6 credits, Semester One)

ARCH 546: TALL BUILDING DESIGN STUDIO II

(6 credits, Semester Two)

The Tall Building Design Studio is the core of the M.TBVU design pathway. Students work collaboratively in small groups (typically 2–4 students), or individually, on a real-world design problem and site of some complexity, either on an urban scale or a single tall building. All students undertake ARCH 546 Tall Building Design Studio II in semester two, irrespective of whether on the M.TBVU design or research pathways. A major international trip is undertaken in semester two, with a travel stipend offered to help support the building/site visits and cultural experience. The trip allows students to explore real-world examples related to the studio project and gives valuable insights into architectural innovations and various design strategies (Note: All students in the program, irrespective of design or research pathway, can join this international trip – see more on page 16). The studio typically meets with professors to conduct “desk crits” on two afternoons per week, with a weekly “pin-up” setting the overall pace. In addition, an interim mid-term review, and final review, provides feedback for refinement, and assessment from professors and distinguished invited guest critics. The design exercise usually flows from ARCH 545 Tall Building Design Studio I to ARCH 546 Tall Building Design Studio II, transitioning from the urban scale of semester one, to a specific building scale in semester two. ARCH 573 Tall Building Technologies II is assessed through a developed technical aspect of the design project undertaken in this studio. Examples of past studio subjects and outputs are shown on pages 20–27 of this brochure.

ARCH 570: TALKING TALL I (3 credits, Semester One)

ARCH 571: TALKING TALL II (3 credits, Semester Two)

The Talking Tall course is focused on the “softer” side of tall buildings and cities, and investigates the physical, environmental, and social sustainability implications of urban density and tall buildings at human, architectural, and urban scales. This course provides students with in-depth knowledge and resources to investigate high density in the context of existing and future cities. Sub-topics include design principles; technologies; appropriateness to context; energy consumption; life-cycle considerations; natural ventilation; vertical greenery; façades; new typologies; zoning and planning; analysis of vertical urbanism vs. suburban sprawl; transportation and infrastructure implications; quality of life for residents in tall urban environments; and other subjects. All of this is undertaken with a view to a discourse on what should constitute a holistic vision of “sustainable vertical urbanism.” ARCH 570 Talking Tall I is delivered by the program director, Dr. Antony Wood. The course is convened as a seminar course, with three distinct aspects each week; (i) a presentation on a particular subject; (ii) a reading related to that subject; (iii) a comprehensive discussion around that subject. It is examined through two exams, constituting 50% of the final grade each, at mid-term and end of semester.

In semester two, ARCH 571 Talking Tall II is intended for a smaller group of students who develop a focused research topic of personal relevance, working together with an expert tutor on that subject, with weekly tutorials. The final outputs are a presentation to peers, and a 4000-word paper, the best of which are published in the CTBUH Journal, and disseminated internationally.

ARCH 572: TALL BUILDING TECHNOLOGIES I

(3 credits, Semester One)

ARCH 573: TALL BUILDING TECHNOLOGIES II

(3 credits, Semester Two)

This lecture/seminar course provides students with an understanding of the technologies that enable tall buildings and dense future cities, especially cutting-edge and emerging technologies. The technologies examined embrace both the building and urban (infrastructure) scales. Sub-topics include; artificial intelligence (AI); building automation control systems; building information modeling (BIM); building maintenance; construction; energy conservation and generation, environmental engineering; environmental protection; façade engineering and systems; fire and life safety engineering; geo-technical / foundations; MEP engineering; project and property management; renovation & retrofit; security; seismic engineering; structural engineering; sustainability; transportation; urban infrastructure; vertical transportation; and wind engineering. ARCH 572 Tall Building Technologies I is delivered through weekly lectures, typically given by a high-profile subject expert from the field of practice, together with further research and discussion.

In semester two, ARCH 573 Tall Building Technologies II is focused on a specific topic (e.g., innovative façade systems) at a more detailed level. Students are tasked to incorporate the learning from this subject into their studio project, or a hypothetical tall building if the studio project is not relevant. In addition to designing the façade system, the course utilizes simulation software to discuss the integration of environmental analysis into the design scheme. The course is delivered by presentations on particular subjects and desk crits, on the weekly progress of each project.

ARCH 601: RESEARCH METHODOLOGIES

(3 credits, Semester One)

This course – undertaken with other research-focused students in the College of Architecture at IIT – provides a

foundation for advanced students in the diversity of research paradigms in architecture. The first component is an introduction to the philosophy of knowledge with an emphasis on architecture. The second component entails a critical review and evaluation of diverse research methodologies in current doctoral architectural research. It is intended to provide substantial information on research methodologies not covered in undergraduate and graduate education. In this course students write a series of papers that critically review the course readings and discussions.

ARCH 592: MASTERS PROJECT

(6 Credits, Yearlong or Summer)

The Masters Project involves the synthesis of architectural study into an independent project. The Project most commonly embraces either the design of a tall building, or in-depth research about a specific aspect of tall buildings or cities. Students work one-on-one with a supervisor and outputs might include traditional forms such as a design project or written thesis, but also non-traditional forms such as a website, video, or exhibition. The area of focus for the Masters project is often an extension of a previous study undertaken through other classes.



Visitors looking at the MTBVU student work displayed in the designated area for the MTBVU program at the 2023 Open House “Context” in the Crown Hall Center Core.

ADVISORY AND TEACHING PANEL

The high-profile, multidisciplinary Advisory and Teaching Panel meets once per year to review outputs and the direction of the course. In addition, each member – who is appointed for a three-year term initially – is committed to a significant involvement in the course during their appointment. That involvement might embrace tutorials and studio reviews; presentations to the group; hosting office visits; and other initiatives.

Companies designated with an asterisk (*) have also committed to supporting a paid internship following graduation from the program, pending an application process.



HIS EXCELLENCY, MOHAMED ALI ALABBAR

Founder and Chairman, Emaar Properties, Dubai*

Global entrepreneur and head of most renowned Middle Eastern property developer, owner of Burj Khalifa, Dubai.



WILLIAM BAKER

Consulting Partner, Skidmore Owings and Merrill, Chicago*

Structural engineer for the world's tallest building, the Burj Khalifa, and many other notable projects.



STEFANO BOERI

Founding Partner, Stefano Boeri Architetti, Milan*

Architect for Bosco Verticale, Milan and numerous other vegetated high rise buildings.



VIVIANA MUSCETTOLA

Director, Zaha Hadid Architects, London*

Italian architect and director at ZHA, working on numerous high rise projects globally.



LYNN OSMOND

President & CEO, Chicago Architecture Center, Chicago

Long-standing leader of one of the world's most significant architecture centers / cultural organizations.



JAMES PARAKH

Program Manager of Urban Design, City of Toronto Planning Division, Toronto

Award-winning architect and Chair of the CTBUH Urban Design Committee.



GREGG PASQUARELLI

Founding Principal, SHoP Architects, New York City*

Architect for world's "most slender" tall building, 111 West 57th Street, as well as American Copper, both in New York City, and other notable high-rises.



ROBERT PRATT

Managing Director, Tishman Speyer, New York City*

MD of one of the world's largest real estate development firms, with projects in over 30 countries, and an alumni of IIT's College of Architecture.



BENJAMIN ROMANO

Founding Partner, LBR&A Arquitectos, Mexico City*

Prominent Latin American architect, developer and educator; previous Harvard expert-in-residence; designer of Mexico's seminal Torre Reforma.



MELISSA BURTON

Director, Arup, Toronto*

Leader of planning, advisory and technology services, and an Arup Fellow, with a background in wind engineering and a focus on environmental and urban realm impacts.



ALBERT CHAN

Director Of Development Planning And Design, Shui On Land, Shanghai*

Leads the master planning, sustainability efforts and design of large mixed-use developments in China, including the world-renown Xintiandi in Shanghai.



NATHALIE DE VRIES

Founding Partner, MVRDV, Rotterdam*

Architect, urbanist and lecturer; head of one of Europe's most experimental architectural practices.



WERNER SOBEK

Founder, Werner Sobek Ingenieure, Stuttgart*

Famous engineer of numerous high-rise buildings, as well as founder of the Institute of Lightweight Structures, Stuttgart.



CHARU THAPAR

Executive Director, Property and Asset Management APAC, JLL, Mumbai*

Responsible for the asset management of over 240 million square feet of office space in the Asia Pacific region.



SHAOFENG WANG

CEO, International Operations, China State Construction Group, Beijing

Head of the overseas arm of the world's largest construction firm, with projects in over 40 countries.



JEANNE GANG

Founder, Studio Gang, Chicago*

Chicago-based architect known for several seminal tall buildings such as Aqua and Vista Towers, Chicago.



OUSSAMA KABBANI

Advisor to His Excellency, CEO, Royal Commission for Riyadh City, Saudi Arabia

Urban Development specialist, Harvard graduate, former chief planner for Beirut, and current advisor on the urban expansions of Riyadh.



JAMES VON KLEMPERER

President, Kohn Pedersen Fox, New York City*

Leader of one of the world's most famous architectural practices for tall buildings, designers of Shanghai World Financial Center, Shanghai, among others.



MIKE WELLS

Co-Founder, Biodiversity by Design, London

Ecologist and eco-urbanist, with 40 years experience in ecological science.



CAROL WILLIS

Founding Director and Curator, The Skyscraper Museum, New York City

Architectural historian and author of seminal texts such as "Form Follows Finance: Skyscraper and Skylines in & New York & Chicago."



MUN SUMM WONG

Founding Partner, WOHA Architects, Singapore*

One of the most progressive practices designing environmental high-rise buildings today.

Alumni Reflections



"Coming from Thailand, it was my dream to work at KPF after graduation from IIT."

PIM SUNSANEEVITHAYAKUL
Architectural Designer, KPF,
New York City



"After my PhD on Urban vs. Suburban Sustainability at IIT in 2015, I worked for CTBUH and am now Director of the Master of Urban Design Program at Thomas Jefferson University, Philadelphia."

DR. PENG DU
Director of Master of Urban Design
Program, Thomas Jefferson University



"After the IIT-CTBUH Tall Building Program, I was assisted with a placement in the Gensler Shanghai Office, where I have been since 2018, now an associate."

JARED DAVIS
Designer, Gensler, Shanghai

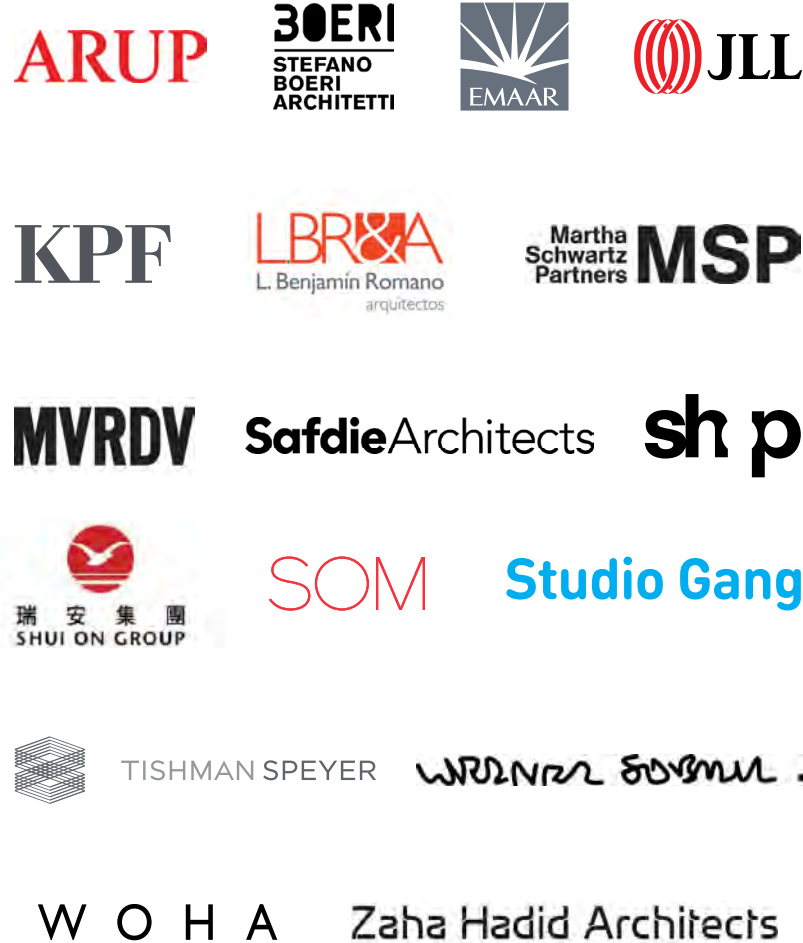


"I continued one of the themes from the tall building course into a PhD study, and now also have a teaching position at IIT."

ZAHIDA KHAN
Adjunct Professor and
PhD Candidate, IIT

INTERNSHIP OPPORTUNITIES

The companies listed here have committed to supporting a paid internship following graduation from the program, pending an application process.



STATEMENT ON STEM

The M.TBVU program is officially approved as a STEM (science, technology, engineering, and mathematics) designated field of study in Architectural and Building Sciences/Technology within the U.S. Department of Homeland Security's STEM designated fields list. International students who have earned degrees in STEM fields in the US, may apply for a 24 month extension of their post completion Optional Practical Training (OPT) employment for a total of 36 months, a significant benefit for international students who wish to stay and work in the US, post-graduation.



Students work in Crown Hall.

ABOUT IIT

The Illinois Institute of Technology is a venerable, research-driven technological university located in Chicago. With more than 5000 students (from nearly every country in the world), 1000 faculty and staff, and a history of breakthrough developments (the cell phone was invented here, as was design-thinking), IIT has been an important center for education and research in the Midwest for more than 100 years.

IIT's campus, designed by renowned architect Ludwig Mies van der Rohe, is located just south of Chicago's vibrant and architecturally rich downtown. Our proximate and collaborative relationship with the nation's third-largest city provides both inspiration and a fertile testing ground for research and practice, as students learn from, and work, in a global metropolis. As such, many of IIT Architecture's students and faculty have left their mark on Chicago in the high-rise realm, including Bruce Graham and Fazlur Khan's Sears (now Willis) Tower and the John Hancock Building (now 875 North Michigan Avenue), among many others.

To learn more about IIT, visit [IIT.edu](https://www.iit.edu).



“The supertall building was invented in the basement of IIT’s Crown Hall, through the work of Fazlur Khan, David Sharpe, and others.”



WILLIAM BAKER
Consulting Partner, Skidmore Owings and Merrill, Chicago
 ADVISORY AND TEACHING PANEL MEMBER;
 SEE PAGE 10

SUPPORT OPPORTUNITIES THROUGH IIT

IIT offers a full program of student support, ranging from financial aid to health care to teaching opportunities. Nearly all IIT students are eligible for aid through the university (Federally supported programs are limited to US citizens). The College also offers a range of scholarships, internships, and work opportunities. As graduate students, participants in the program are also eligible to apply for teaching assistantships in the University, as well as the College of Architecture. For more information on all these programs, please see: [IIT.edu](https://www.iit.edu).

ABOUT CTBUH

The Council on Tall Buildings and Urban Habitat (CTBUH), founded in 1969 and with offices in Chicago, Shanghai and Venice, is the world’s leading non-profit organization for all those interested in the future of cities.

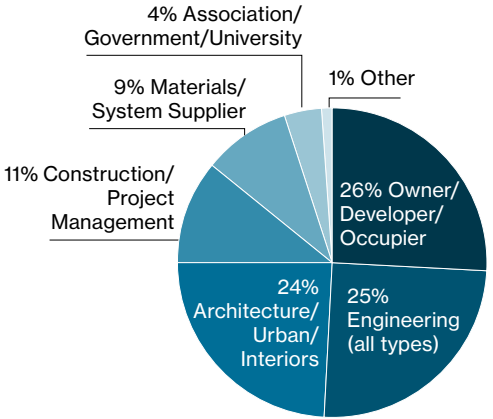
We explore how increased urban density and vertical growth can support more sustainable and healthy cities, especially in the face of mass urbanization and the increasing effects of climate change. The relationship between policy, infrastructure, buildings, people, space, and place is key.

Students taking the M.TBVU program will benefit from CTBUH initiatives directly, including opportunities for internships, sponsored research, design, conference, and travel programs (see more on this on page 16). In addition, students will gain unparalleled access to the CTBUH global network of multi-disciplinary professionals. Key office visits, building tours, industry internships and future career opportunities will be an integral part of the program. For a glance at some of the high-profile CTBUH members who are part of the M.TBVU Advisory and Teaching Panel, see page 10.

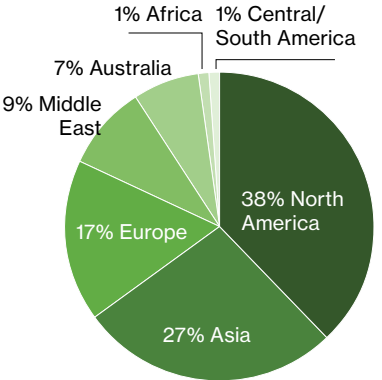
To learn more about the Council, visit [CTBUH.org](https://www.ctbuh.org).



“The CTBUH organizational member network embraces over 2 million individuals, working in 10,000+ offices, in more than 100 countries around the world.”



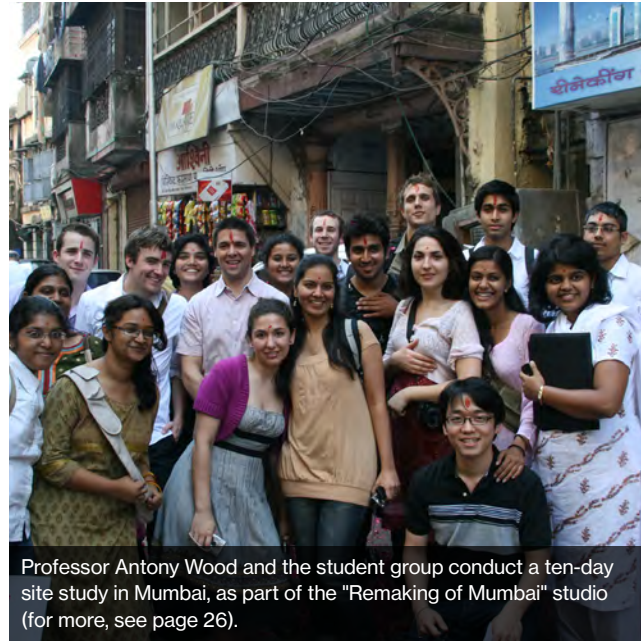
CTBUH Members by Profession



CTBUH Members by Region

UNIQUE SUPPORT OPPORTUNITIES THROUGH CTBUH

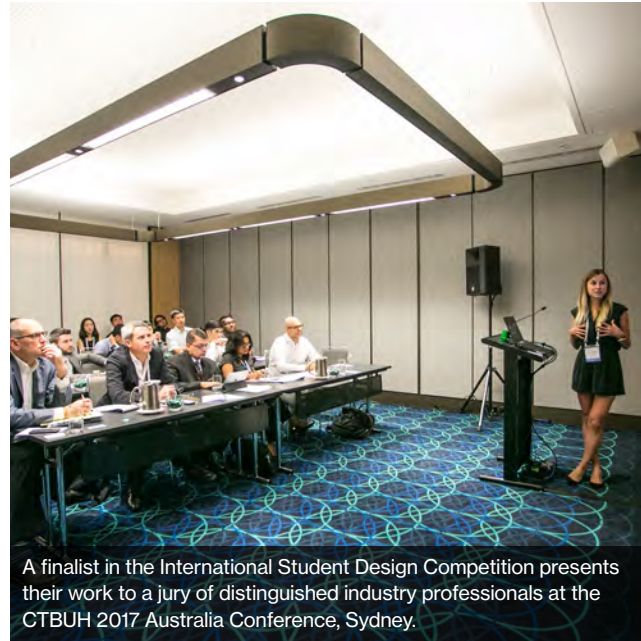
In addition to internship and career opportunities, students in this degree program can benefit from the following specific academic programs convened by the CTBUH:



Professor Antony Wood and the student group conduct a ten-day site study in Mumbai, as part of the "Remaking of Mumbai" studio (for more, see page 26).

INTERNATIONAL TRAVEL PROGRAM

Every student in the program will have the opportunity to join an overseas study visit in semester one, receiving a travel stipend (usually around US\$1,000) to help offset expenses. The destination for this study visit is usually driven by two, typically aligned, influences: (i) the location of the CTBUH Annual Conference, and (ii) the location of the site that serves as a vehicle for the Tall Building Design Studio (ARCH 545).



A finalist in the International Student Design Competition presents their work to a jury of distinguished industry professionals at the CTBUH 2017 Australia Conference, Sydney.

INTERNATIONAL STUDENT DESIGN COMPETITION

The CTBUH Student Tall Building Design Competition champions site-specific urban responses to global issues, while giving top students the chance to showcase their work. Finalists are selected to present their proposals to a jury of experts at the CTBUH International Conference, where an overall winner is selected. Winning students receive cash prizes, as well as complimentary conference registration and travel/accommodation costs.



Santiago Calatrava, *Founding Partner*, Santiago Calatrava Architects & Engineers, and Advisory and Teaching Panel Member (see page 10), delivers a presentation at the CTBUH 2018 International Conference in Dubai.

CONFERENCE ATTENDANCE

The Council holds two major international conferences per year; its Tall & Urban Innovation Awards Conference in the spring (held in Chicago), and its Annual Conference held in a high-rise city somewhere around the world each fall. All students in the program receive complimentary registration at both conferences (typically around US\$1,500). Locations of CTBUH conferences in the past ten years include Abu Dhabi; Dubai; Hong Kong; London; Mumbai; New York City; Seoul; Shanghai; Shenzhen; and Sydney.



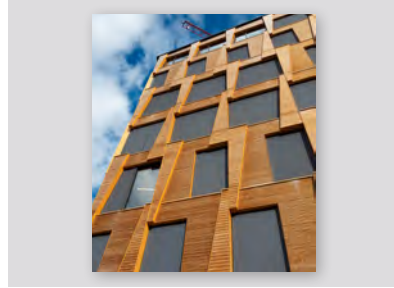
IIT student representatives Zahida Khan and Clinson Poon accept the 2016 CTBUH Student Traveling Design Research Studio Award from Ray Shick, Co-Regional Managing Principal for Gensler Asia Pacific at the CTBUH 2016 Shenzhen Conference.

STUDENT RESEARCH COMPETITION

The goal of the annual Student Research Competition is to assist talented students, working in groups under the guidance of a professor, to focus on a relevant research question, and create an engaging output as a response. The competition typically culminates with an award of US\$10,000–\$20,000, recognized on stage at the CTBUH International Conference, and promoted through CTBUH channels and platforms. The project often also leads to a publication or other substantial output.

PHD AND RESEARCH OPPORTUNITIES

The program is an excellent feeder into three different types of career: professional practice, further advanced study at the PhD level, or even a career in research. There are opportunities for internships at CTBUH during the program itself, as well as the possibility of appointment as a research assistant after graduation. The following studies are examples of industry and federally-funded research projects at CTBUH in the past few years.

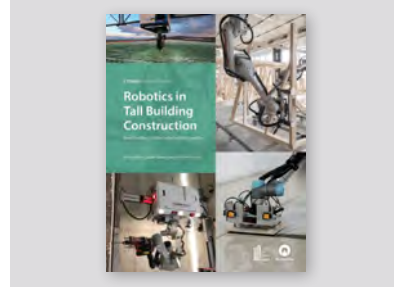


Future Timber City: An Awareness and Educational Program for Future, Sustainable, Dense Cities

Project Completion: July 2022
Project Duration: 2 years

Funding Sponsor: USDA Forest Service and Binational Softwood Lumber Council

Provides a framework for better understanding the character and dimensions of a future mass timber city.



Robotics in Tall Building Construction

Project Completion: November 2020
Project Duration: 2 years

Funding Sponsor: Schindler

Identified the incentives for, and obstacles to, the adoption of robotics in the construction industry.

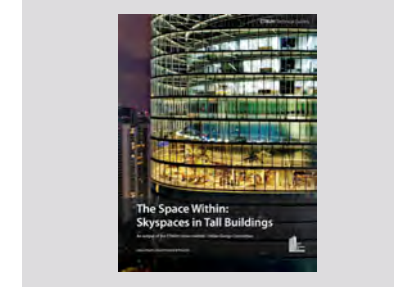


Skybridges: Bringing the Horizontal into the Vertical Realm

Project Completion: August 2020
Project Duration: 2 years

Funding Sponsor: TK Elevator GmbH

Succinctly captured the state-of-the-art in skybridge design, as well as puts forward a set of principles for future development.



The Space Within: Skyspaces in Tall Buildings

Project Completion: November 2018
Project Duration: 2 years

Funding Sponsor: CTBUH Urban Habitat Committee

Identified and addressed the missing technical requirements for green living technologies (for roofs and façades) in existing international standards.

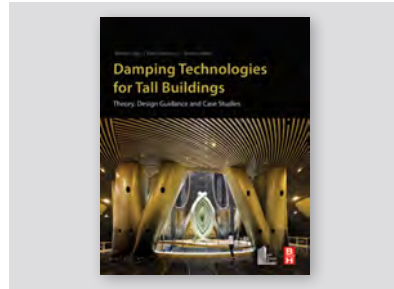


A Study on the Design Possibilities Enabled by Ropeless, Non-Vertical Elevators

Project Completion: September 2018
Project Duration: 2 years

Funding Sponsor: TK Elevator GmbH

Investigated how technological innovation in elevators, specifically ropeless non-vertical cabins, could impact the design outcomes of tall buildings and cities.



A Comprehensive Study on Tall Building Damping Technologies

Project Completion: October 2017
Project Duration: 2 years

Funding Sponsor: Bouygues Batiment International

Produced a comprehensive study of the damping technologies available for tall buildings, describing their function and relationship to other building components.

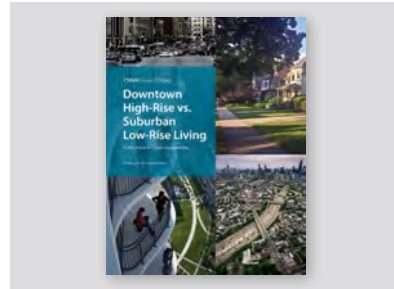


The Space Between: Urban Places, Public Spaces & Tall Buildings

Project Completion: October 2017
Project Duration: 2 years

Funding Sponsor: CTBUH

Investigated the importance of publicly accessible spaces surrounding tall buildings, and how they impact the quality of life for those that live, work, and visit tall building neighborhoods.



A Study of the Sustainability Implications of Differing Urban + Suburban Locations in Chicago

Project Completion: February 2016
Project Duration: 2 years

Funding Sponsor: CTBUH and Illinois Institute of Technology

A comprehensive real-data study on all factors that contribute to "sustainability" in an urban vs. suburban context.

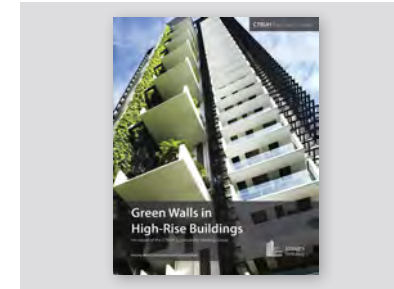


Life Cycle of Tall Building Structural Systems

Project Completion: January 2015
Project Duration: 2 years

Funding Sponsor: ArcelorMittal

Established a definitive comparison of the life-cycle carbon implications of steel, concrete, and composite structural systems in tall buildings.



Green Walls in High-Rise Buildings

Project Completion: October 2014
Project Duration: 1 year

Funding Sponsor: Arup

Set out recommendations for selecting, implementing, and maintaining green walls in high-rise buildings.



CIB, CTBUH & UNESCO Research Roadmap

Project Completion: January 2014
Project Duration: 2 years

Funding Sponsor: CTBUH; International Council for Research and Innovation in Building and Construction; UNESCO

Identified priority research topics and gaps in the field of tall buildings, and created a guide to assist professionals in the planning of future research and funding.

RECENT MTBVU STUDIOS AND PAST IIT-CTBUH HIGH-RISE STUDIOS

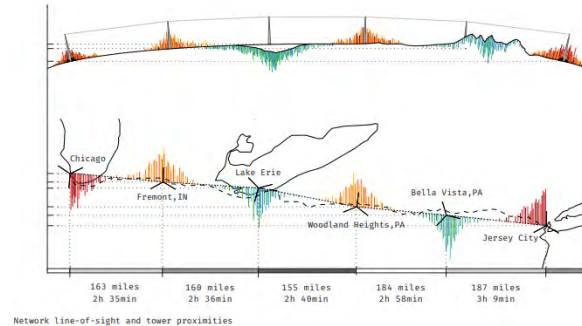
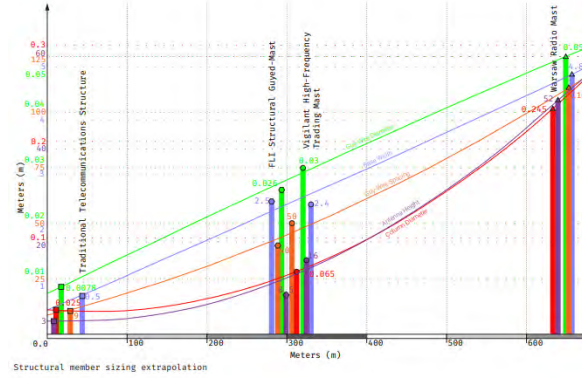
The following is a selection of recent/past projects by Illinois Institute of Technology (IIT) students. This work – focused on tall buildings and vertical urbanism – showcases an emphasis on connected urbanism, rather than on a single tall building.

NOVA PRO FORMA

Various Cities, United States

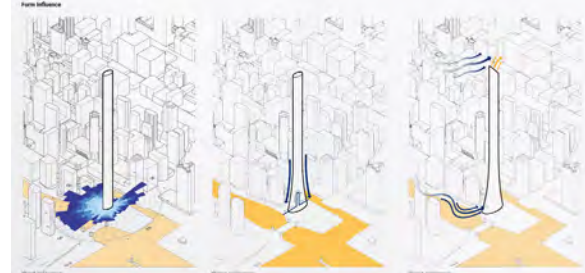
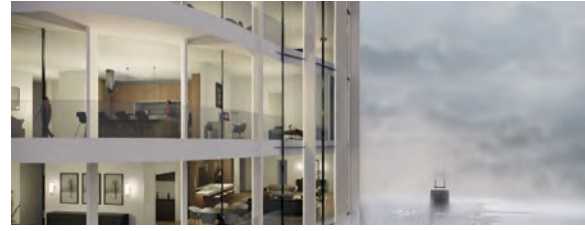
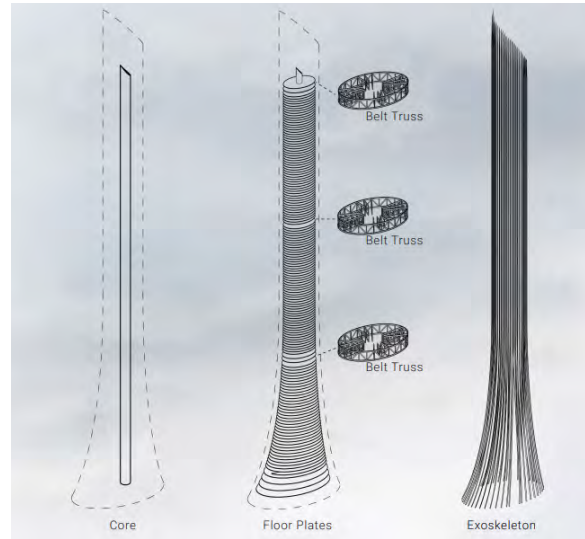
In fall 2023, the world-renowned architecture firm Skidmore, Owings & Merrill (SOM) ran this MTBVU studio. Under the guidance of three senior colleagues at SOM: Scott Duncan, Design Partner; Jorge Rovira, Associate Principal; and Jason Fisher, Associate Principal, the Nova Pro Forma design studio tasked students to reimagine the tall building as the embodiment of emerging and entirely new uses that speak to novel modes of working and the ecological imperatives we confront today. Students chose from six “alternatives,” developing both an architecture and a nova pro forma, based on the following business cases for tall structures: 1) Carbon Capture; 2) Energy Generation; 3) Energy Storage; 4) Food Production; 5) Server Farming; 6) Medicine; and 7) An amalgam of all the six cases to support multifamily housing.

The viability of the traditional tall building typology is currently being called into question by multiple factors. The two primary functions housed within the vast majority of towers – commercial office and multi-family residential – have each seen radical transformations triggered by the COVID pandemic, resulting in less demand for office space due to remote work practices, and the attendant downward pressure on living in the urban core, recognizing that many types of work can be done from the suburbs or even from more dispersed locations. A heightened awareness about the importance of energy efficiency and other forms of environmental sustainability has also caused many to question those aspects of the tall building as a type.

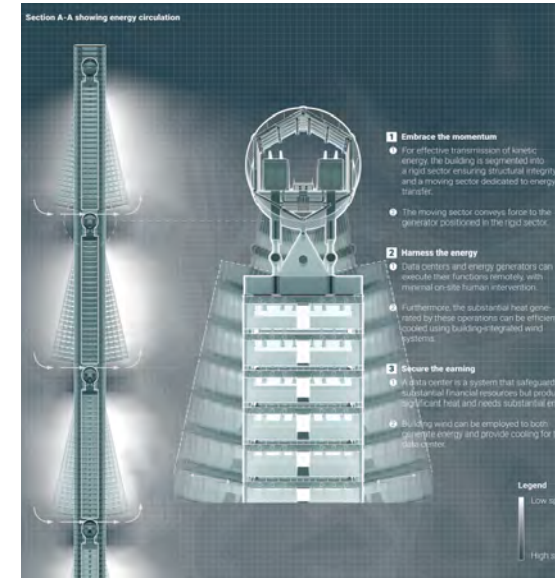
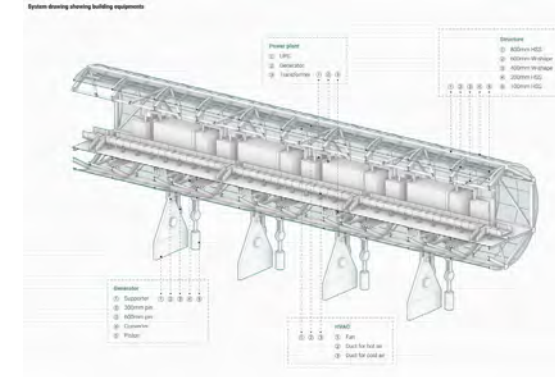


Above: “Five Jumps to Chicago” project by Davis Housman

An often overlooked aspect of tall building design is the *pro forma* – Latin for “as a matter of form” and the financial model that informs the number of floors, gross floor area, cost dynamics and revenue stream – that is so fundamental to its reason for being. Without the pro forma, there is no tall building. In light of the aforementioned pressures, the future of the tall building as a typology is reliant on a reimagining of the pro forma – a *nova pro forma*.



Above: “The Living Carbon Effect” project by Allison Drooger



Above: “Unmanned Building for Man” project by Jusang Lee

TOWARDS ZERO-CARBON CITIES

Shenzhen, China

The United Nations forecasts that 70 percent of the world's projected nine billion population will be urbanized by the year 2050, creating one million new urban inhabitants per week for the next several decades¹. At the same time, the planet is rapidly experiencing climate change, and every indication is that there is an urgent need to slow the rate of planetary warming within less than a decade to avert catastrophic consequences, especially with respect to coastal cities².

This year-long studio conducted research in order to develop a typology of possible sustainable vertical cities that *integrate the maximum number of relevant sustainable design strategies and technologies*, not only in terms of carbon, but also in terms of internal environment, building community, and the impact of the building on the physical, social and cultural realms.

In the fall semester, students focused on the urban scale, in the context of the Qianhai area of Shenzhen, China – which they visited. They researched and designed a zero-carbon city, which was expected to run entirely on renewable energy. In the spring semester, the students focused on a zero-carbon cluster of skyscrapers – specifically developing the design within the urban design developed in the previous semester. The final designs took into consideration the cultural, climatic, and physical aspects of the location, and focused on net-zero carbon technologies and systems within the design proposals.

¹United Nations Department of Economic and Social Affairs, Population Division, 2018; <https://www.un.org/development/desa/en/news/population/2018-revision-of-world-urbanization-prospects.html>

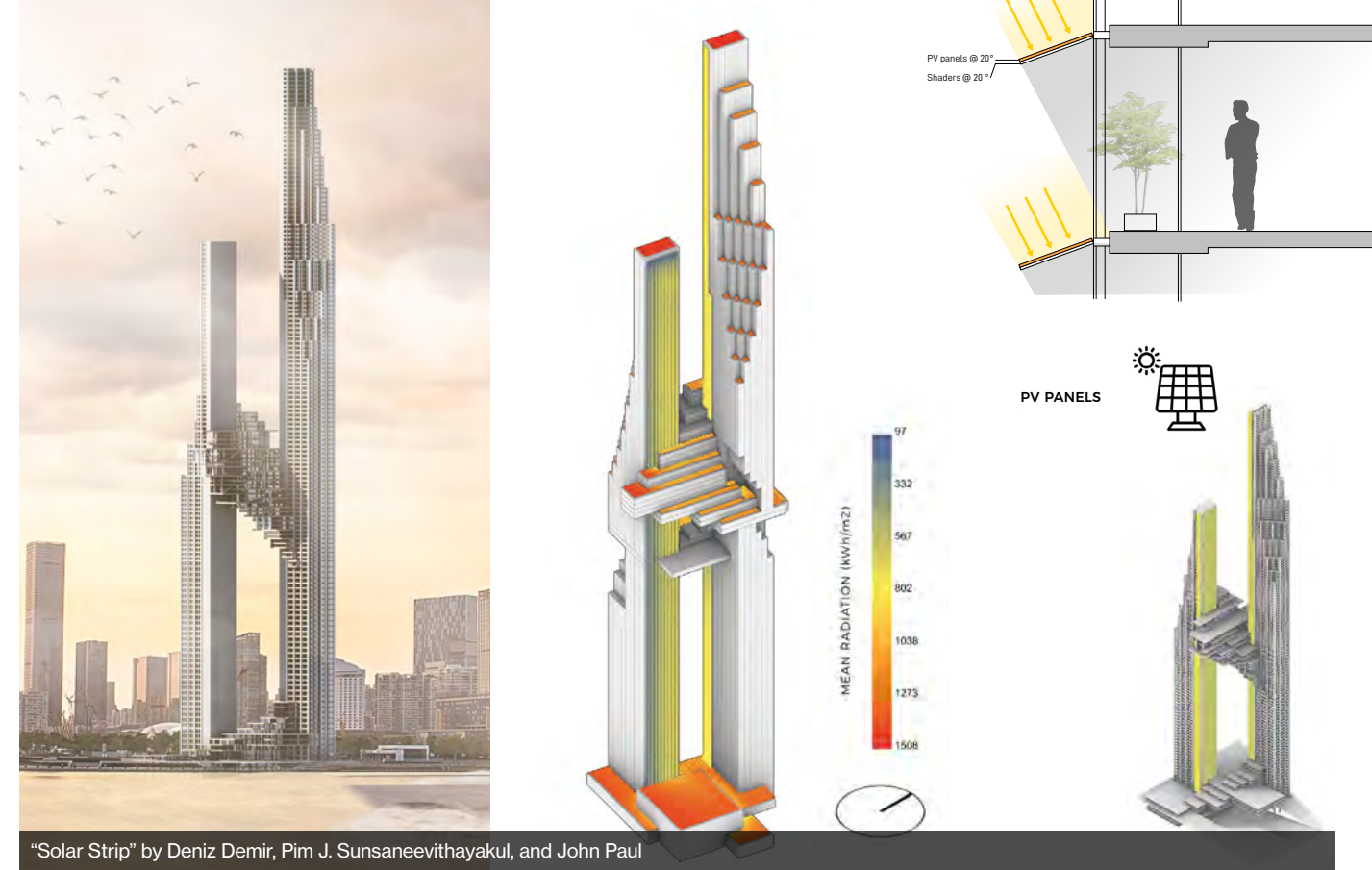
²Global Warming of 1.50C. Summary for policymakers. Intergovernmental Panel on Climate Change, 2018.



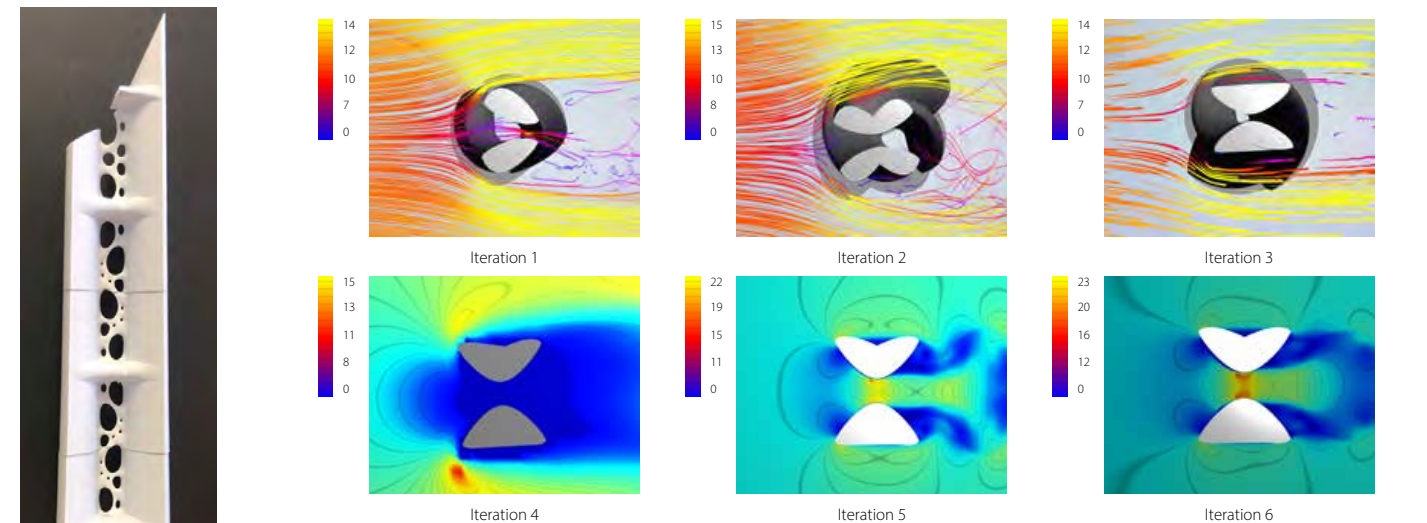
“Vertical City” project by Andrea Fernandez, Qin Lu, and Yilie Wang



“SEAD: Sustainable Energy use through Agricultural Development” project by Torin Schuster and Hanqing Xu



“Solar Strip” by Deniz Demir, Pim J. Sunsaneevithayakul, and John Paul



“Anemoi Towers” by Efrain Juarez, Ankhbayar Dalanjin, Mateusz Dmowski. Left: Model; Right: Initial wind flow simulations from prevailing winds on early planar design iterations.

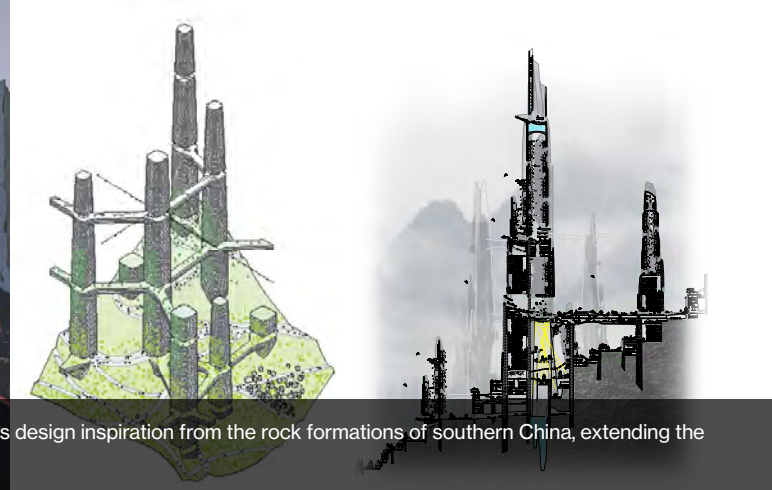
SUSTAINABLE VERTICAL URBANISM: TOWARDS 2050

Global Studio

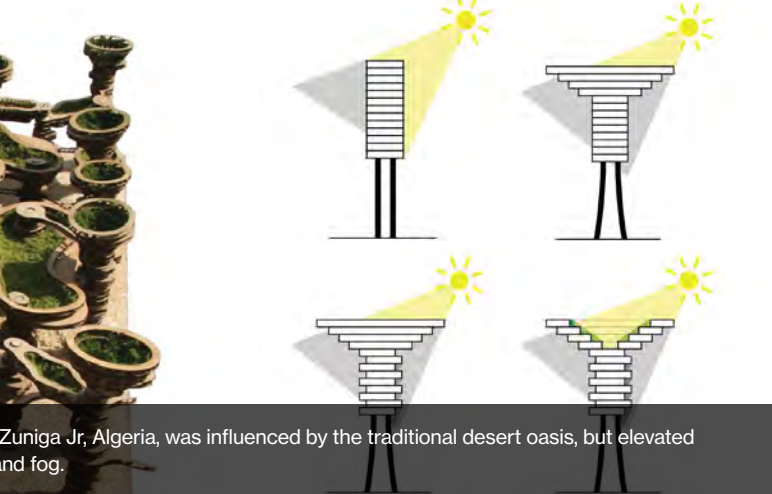
In this year-long studio, students were presented with the following scenario: The year is 2050 and, after five decades of attempting to adapt cities to cope with “natural” disasters of increasing frequency and severity in the face of accelerating climate change, humanity has come to accept a simple truth: that many existing cities – especially coastal cities – are no longer viable into the future. The United Nations has thus established a task force to address the needs of our cities. Students were asked to determine the most sustainable global locations for new cities, and determine how these cities can maximize environmental and cultural symbiosis with both terrain and climate.

In the fall semester, students conducted research in order to determine where these new cities would be best located, relative to; current population densities; the impact of climate change; and the inherent sustainability opportunities of climate and resources locally. Student groups developed the outline strategies for cities in radically different terrains and climates; the hot Saharan desert of north Africa; the mountainous Himalayas; a deforested region of the Amazon; the increasingly flooded Ganges delta of Bangladesh; the grasslands of south Sudan; the melting Arctic; and the middle of the South China Sea.

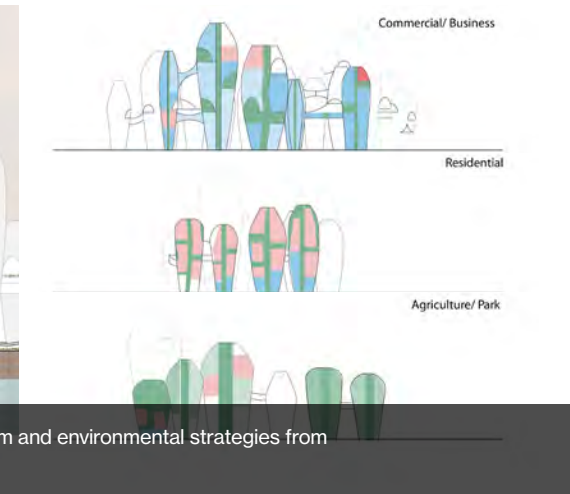
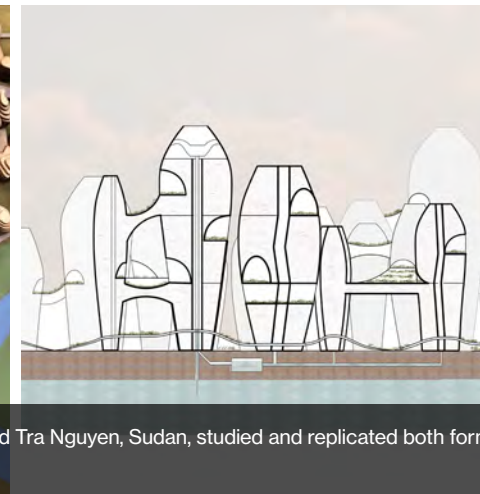
In the spring semester, students developed their strategic urban designs into the detailed design of a cluster of buildings. Students determined the size, height, function, accommodation, and responsibilities of the building(s), according to their strategic urban plan and a consideration of urban life in the future.



“The Mountain City” by Jared Davis and Drew Armetta, Himalayas, took its design inspiration from the rock formations of southern China, extending the city into mountainous vertical form.



“The Desert City” by Kristen Barrett, Olumurewa Oguntade, and Ernesto Zuniga Jr, Algeria, was influenced by the traditional desert oasis, but elevated to a datum of 500–1,000 meters, harvesting water from high-level cloud and fog.



“The Grasslands City” by Arlene Hayes and Tra Nguyen, Sudan, studied and replicated both form and environmental strategies from African termite mounds.

ADMISSION REQUIREMENTS

The Masters of Tall Buildings and Vertical Urbanism (M.TBVU) program is open to all applicants with a bachelor's degree and a strong interest in this field. The following items are required to apply for the program:

- Application letter, explaining your interest and background in this field.
- Official transcripts
- Two letters of recommendation
- Portfolio

INTERNATIONAL STUDENTS

International applicants must meet all of the general requirements listed above as well as the following additional requirements.

- English proficiency exam (TOEFL/IELTS) scores
- Financial affidavit of support form (FAS)
- Copy of passport identity page
- School transfer form (international transfer applicants only)

WANT TO KNOW MORE?

For detailed information on deadlines and admission requirements, please visit:

arch.iit.edu/study/mtbvu

For more info, contact Program Director Dr. Antony Wood at: awood@ctbuh.org



Front cover image & back cover image:
Project titled "PhytoMed Hub," created by
Omai Fuaad Godil as part of the MTBVU
Studio run by SOM in Fall 2023.