

**VOLUMETRIC TYPOLOGIES**  
*for Encounters between Science and the Public*

# BRIEF

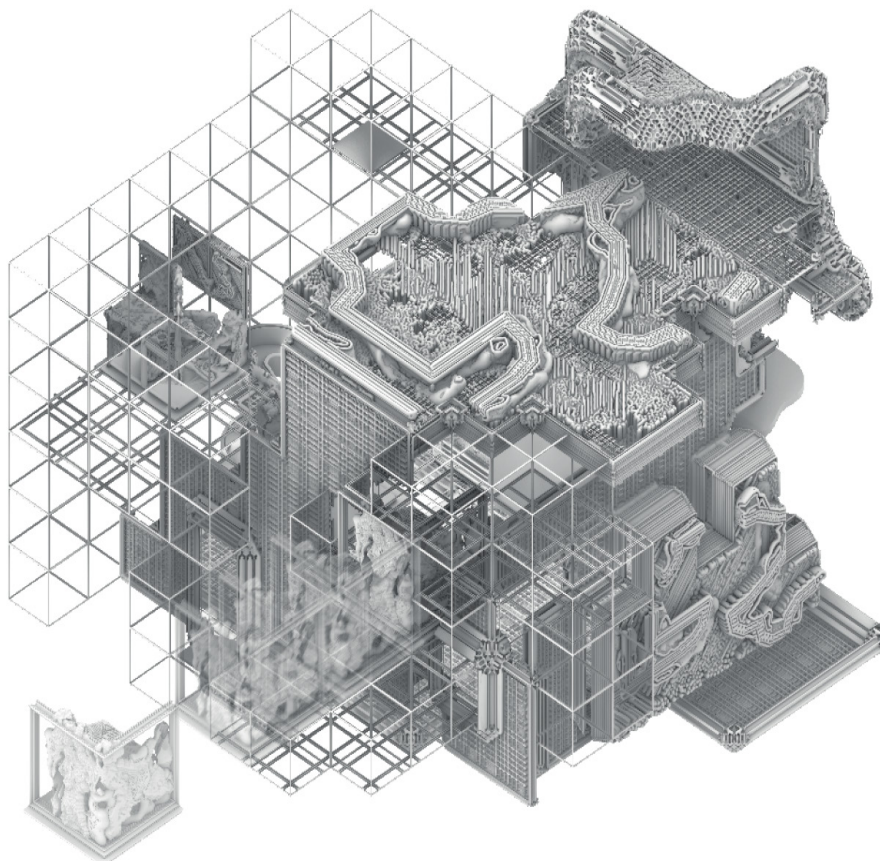
## ENGLISH VERSION AT THE END OF THE DOCUMENT

### VOLUMETRIC TYPOLOGIES for Encounters between Science and the Public

In diesem Jahr werden wir ein "Haus der Wissenschaft" entwerfen, das dem transdisziplinären Austausch zwischen Gesellschaft und Forschung zum Thema hat und ihm einen Ort im Zentrum von Innsbruck gibt. Innsbruck ist eine Universitätsstadt mit langer Geschichte, hat aber im Vergleich zu anderen Städten keinen zentralen Ort der Wissenschaftsvermittlung. Die zahlreichen transdisziplinären Aktivitäten der einzelnen Forschenden und die vielfältigen Sammlungen der Institute sind fragmentiert auf viele Standorte verteilt, ohne die Möglichkeit, "Gravitation" und urbane Präsenz zu erzeugen. Für ein Haus der Wissenschaft gibt es keine "klassische" Typologie, wir werden uns daher Räume der Wissenschaft ansehen und von ihren Charakteristika und ihrer Beziehung zum öffentlichen Raum lernen (vom Labor, dem Konferenzraum, dem Atelier, dem Depot, dem Studiensaal, dem Anatomietheater, dem Hörsaal, dem Archiv, dem Elfenbeinturm,...)

Dazu werden wir neue Typologien und Raumkonzepte entwickeln und die verschiedenen Facetten und Potentiale "volumetrischer" Gestaltung untersuchen: räumliche Komplexität und Verschränkung, Mehrdeutigkeit von Räumen, Raumplan und Raumfolge, multisensorische und "tiefe" Oberflächen, hybride Funktionalitäten, Multi-Materialität, hochaufgelöste und graduelle Strukturen, performative oder adaptive Konstruktionen,... you name it. Studierende werden dabei zu Beginn des Semesters persönliche Schwerpunkte und Interessen innerhalb des "Volumetric Designs" artikulieren und diese in einem komplexen Gebäudeentwurf umsetzen.

Volumetric Design meint nicht nur, dass Gebäudeentwürfe räumlich komplex und durchdrungen sind. Es beschreibt vor allem auch eine Entwurfsmethode, die von i.sd erforscht wird und welche die volumetrischen Möglichkeiten digitaler Werkzeuge voll ausschöpft. Von Scans der Umgebung, der Integration dreidimensionaler Klimadaten bis zu volumetrischen Skizzieren mit 3D-Punktwolken werden wir unterschiedliche Möglichkeiten in gemeinsamen Workshops betrachten und in Designstudien anwenden. Das volumetrische Denken wird uns eine ganz neue Sichtweise auf unsere Entwürfe erlauben: wie mit einem Röntgenblick können wir das Innere und seine Struktur gleichzeitig mit der äußeren Formation entwickeln. Entscheidungen im kleinsten Detail können Rückwirkungen auf das Ganze haben und umgekehrt.



# BRIEF

## AUFBAU DES STUDIOS

### *Task 1: Volumetric Design (5 Wochen)*

In Einzelprojekten entwickeln Studierende ein volumetrisches Raumkonzept, welches in einem physischen "Ausschnittsmodell" artikuliert wird. Vorbereitend dazu analysieren Studierende architektonische Referenzen und leiten von diesen volumetrische Eigenschaften ab. In Workshops werden die notwendigen digitalen Methoden vermittelt. (Vorkenntnisse in Rhino/GH und Houdini sind nicht notwendig).

### *Task 2: Volumetric Site Analysis und Research zur Typologie (4 Wochen)*

In parallelen Workshops werden einerseits volumetrische Methoden der Site-Analyse vermittelt und andererseits mögliche Typologien für ein Haus der Wissenschaft analysiert und diskutiert. In Gruppen entwickeln Studierende ein digitales Umgebungsmodell mit Skizzen der urbanen Idee und ein volumetrisches Diagramm für ein erstes Gebäudekonzept.

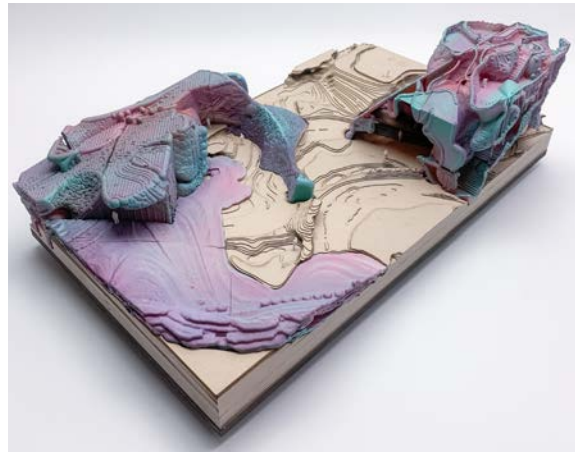
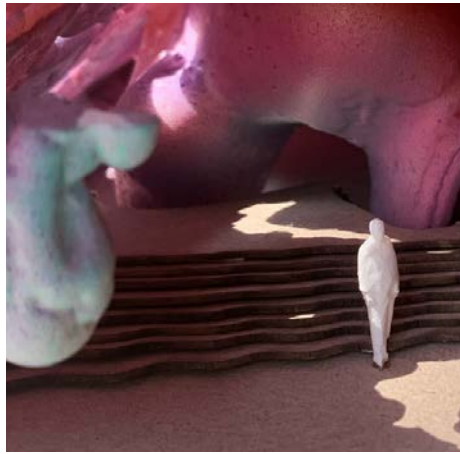
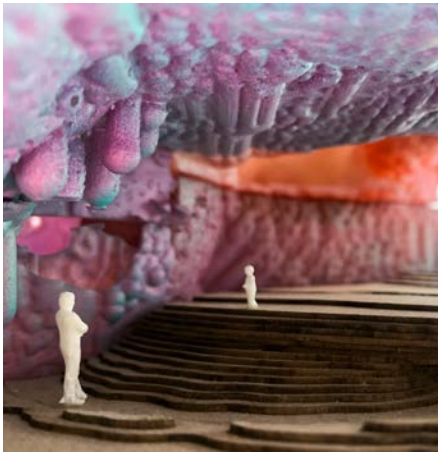
### *Task 3: Haus der Wissenschaft - Building Design (6 Wochen)*

Die Gebäudeideen und volumetrischen Konzepte werden weiterentwickelt; Raumprogramm, Erschließung, Konzepte zu öffentlichem Raum und Ausstellungsgestaltung werden integriert. Am Ende dieser Phase präsentieren Studierende einen Gebäudeentwurf, der im Sommersemester weiterentwickelt und verfeinert wird. Ziel ist es, bis zum Ende der Bachelorarbeit hochaufgelöste und detaillierte Gebäude zu erarbeiten und deren innovative Typologie sowohl in ihrer Benutzung und kuratorischen Bespielung als auch in ihrer strukturellen, materiellen oder klimatischen Wirkweise darzustellen. Ziel ist es, dass die Studierende hier eigene Schwerpunkte setzen und die Richtung der Ausarbeitung bereits zu Beginn des Sommersemesters definieren.

Das Studio ist Teil eines "Vertical Studios" am i.sd. Das bedeutet, dass das Thema "Haus der Wissenschaft" in allen Entwerfen bearbeitet wird; jedes Studio hat jedoch seinen eigenen Fokus. Schwerpunkt dieses Studios liegt auf der Erarbeitung detaillierter und komplexer Entwürfe im Zentrum von Innsbruck. Es sind auch übergreifende Studio-Aktivitäten geplant wie Input-Lectures von Wissenschaftlern und Kuratoren, Besuch von Referenzprojekten sowie Cross-Reviews zwischen den Studios.

# REFERENCES

## PHYSICAL MODELS (BACHELOR STUDIO 2023/2024)

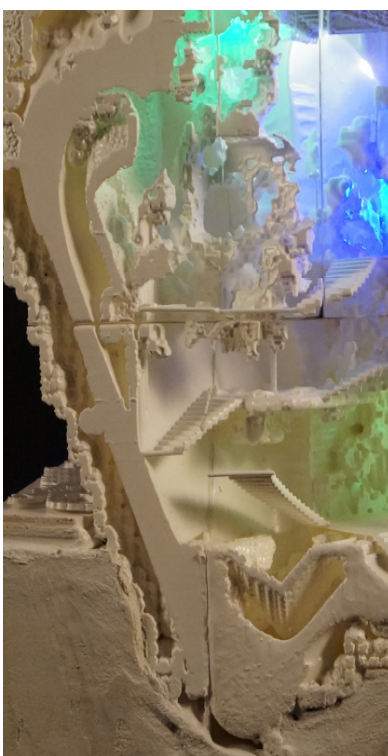


Student: Lena Fritsch

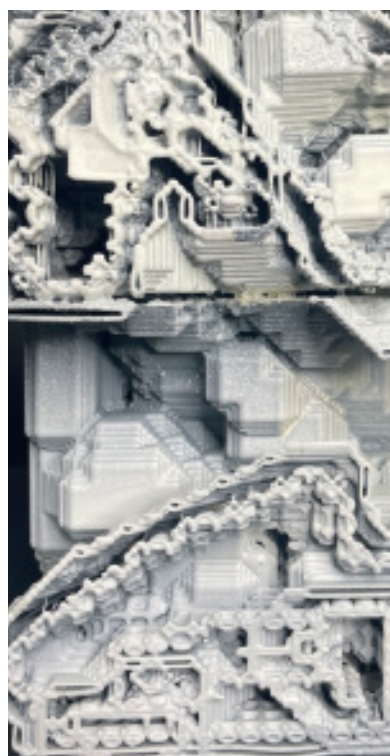


Students: Moritz Kählß & Julian Duggen

Students: Jakob Vallis & Dominik Obkircher



Student: Sabrina Huber



Students: Dominik Valle Sieber & Tobias Albrecht



Student: Selena Troll

# REFERENCES

## PHYSICAL MODELS (BACHELOR STUDIO 2023/2024)



Student: Jolina Thomé



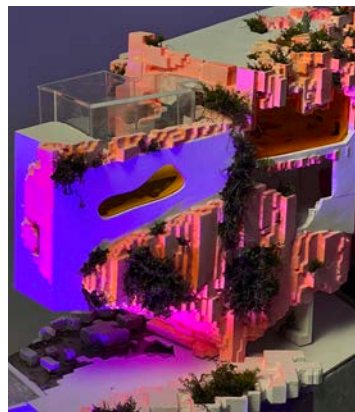
Students: Arno Müller & Pia Schreithofer



Students: Laetizia Karg & Jo-Anne Ravinger

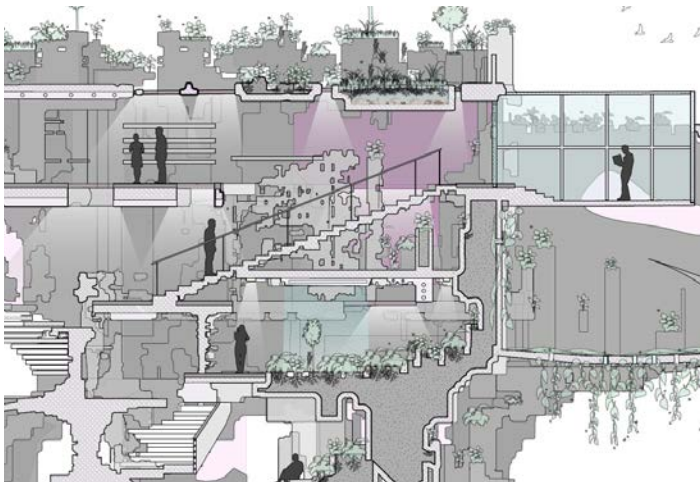


Students: Chiara Hummel & Emma Gänzer

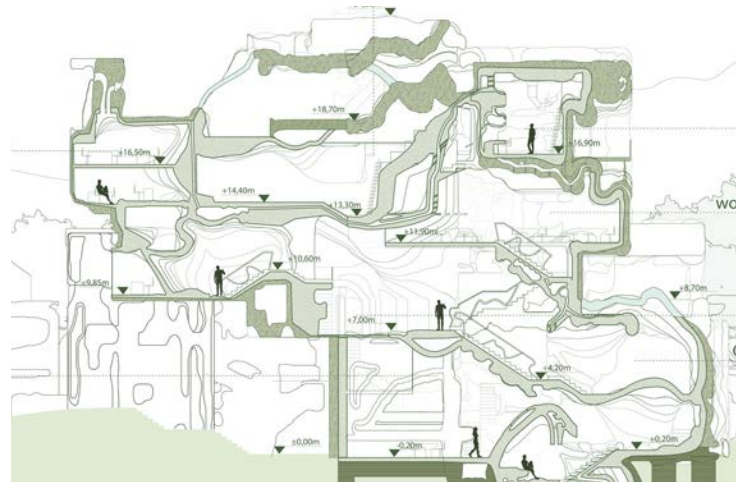


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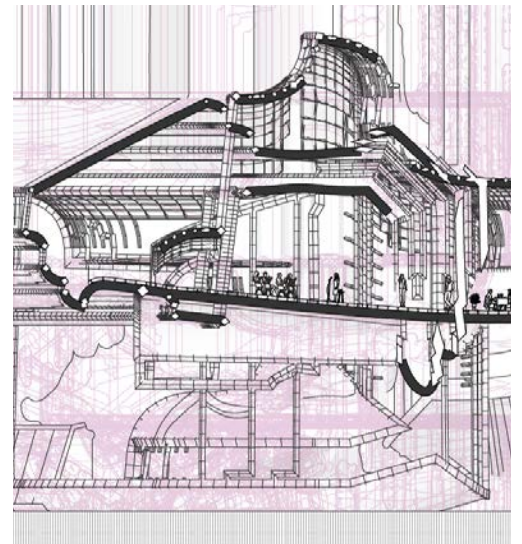
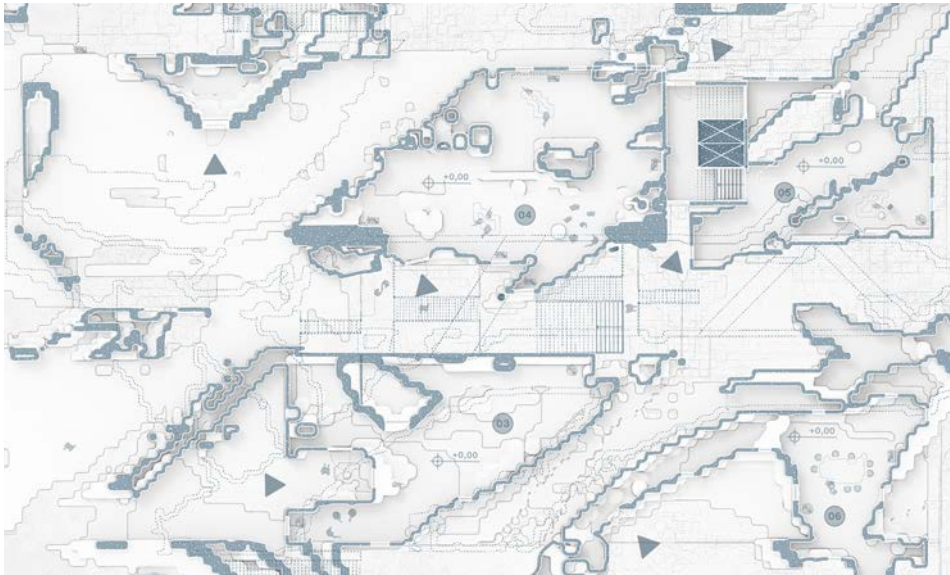
## DRAWINGS (BACHELOR STUDIOS 2022 - 2024)



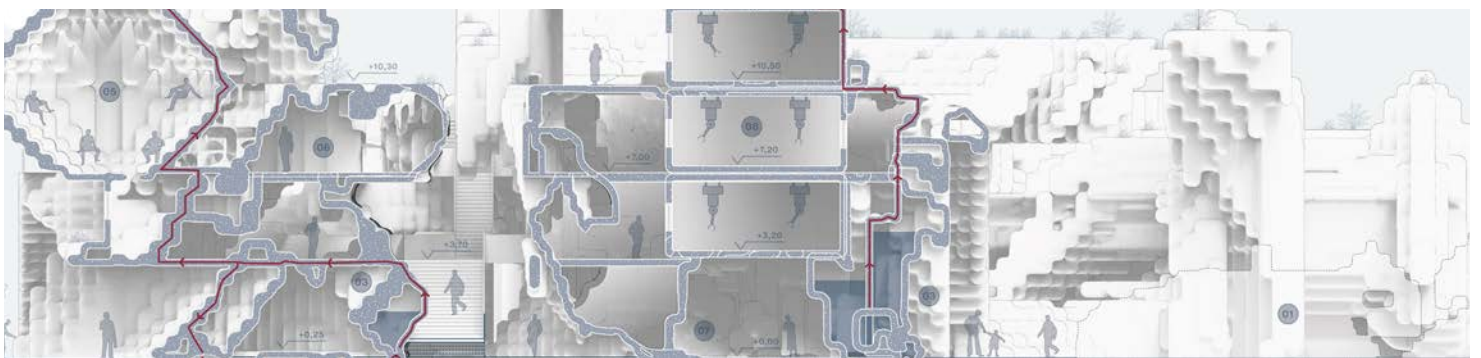
Students: Laetizia Karg & Jo-Anne Ravinger



Student: Jolina Thomé



Student: Selena Troll



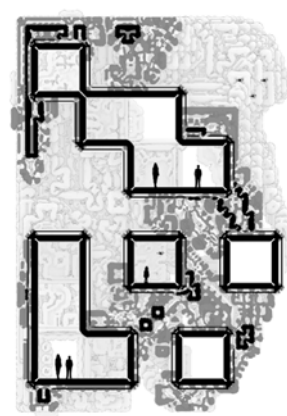
Students: Arno Müller & Pia Schreithofer



Student: Lena Fritsch



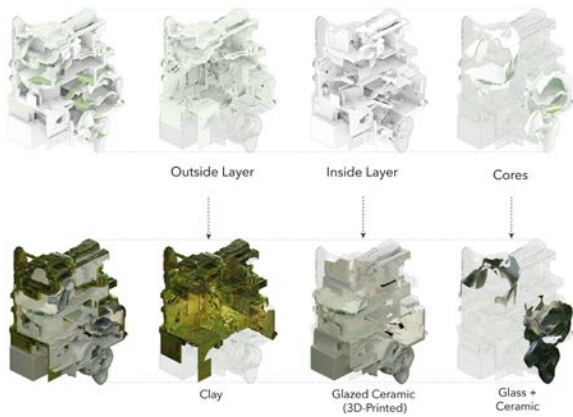
Students: Moritz Kahlß & Julian Duggen



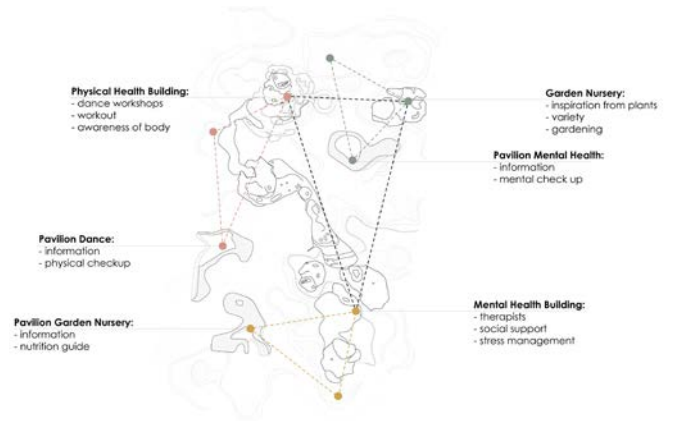
Students: Laura Vuilleumier,  
Julian Duggen &  
Dominik Valle Sieber

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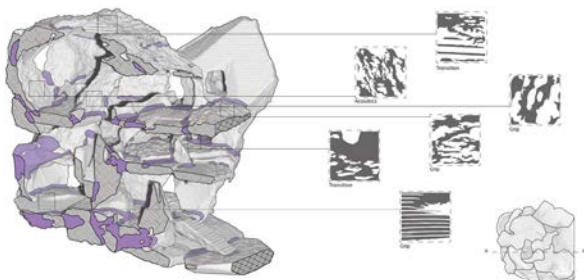
## DIAGRAMS (BACHELOR STUDIOS 2022 - 2024)



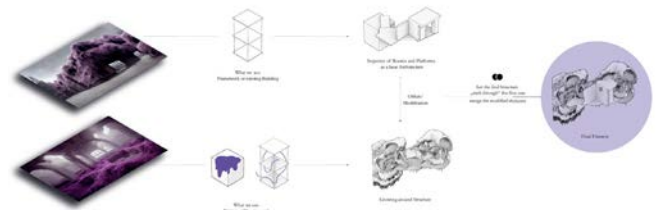
Student: Jolina Thomé



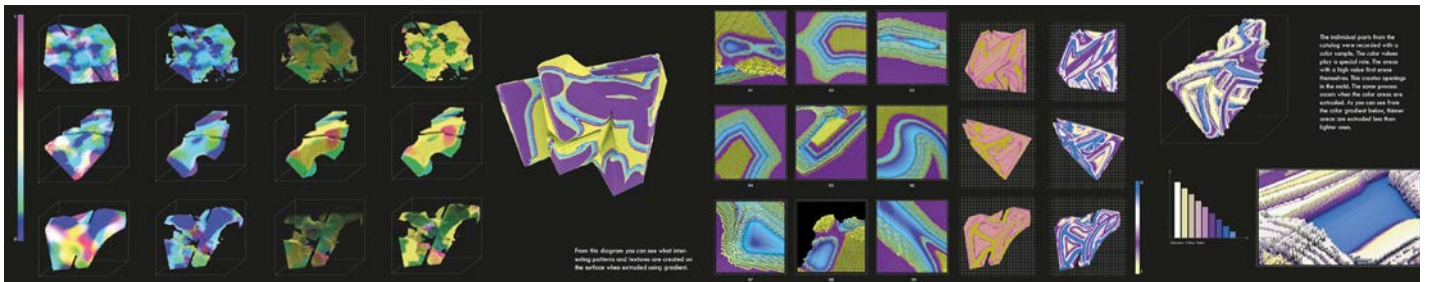
Students: Chiara Hummel & Emma Gänzer



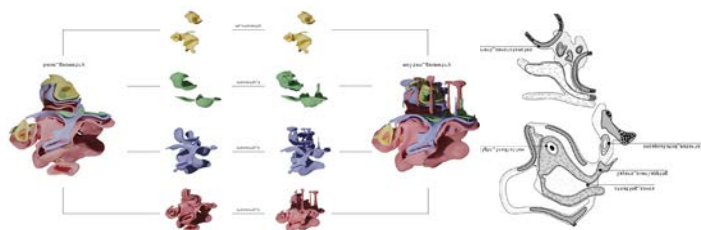
Students: Keno Bokar Diop, Selena Troll & Ron Kalbacher



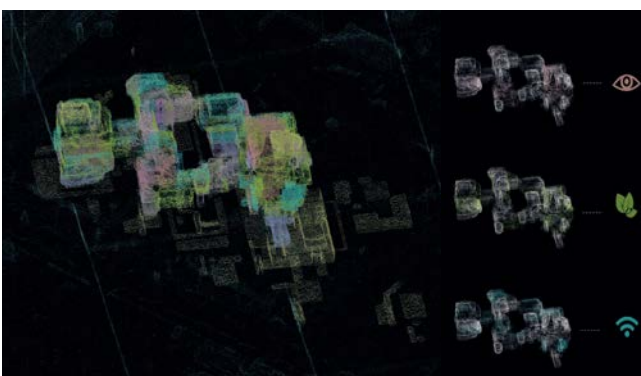
Students: Lena Fritsch, Moritz Kählß & Julian Duggen



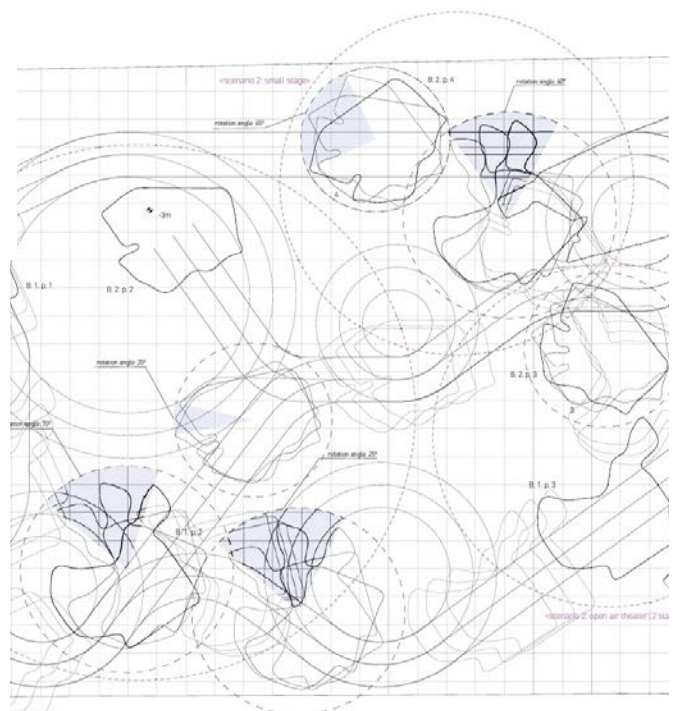
Students: Sabrina Huber & Ron Kalbacher



Students: Lena Fritsch & Tobias Albrecht



Students: Jakob Vallis & Dominik Obkicher



Students: Julian Duggen & Moritz Kählß

# REFERENCES

## VISUALIZATIONS (BACHELOR STUDIOS 2022 - 2024)



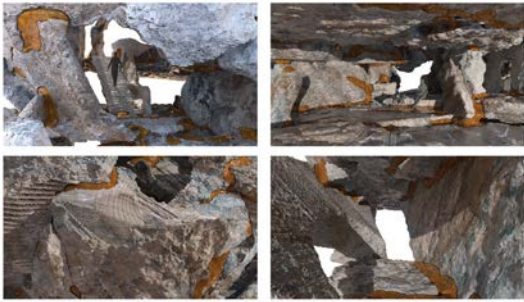
Students: Sabrina Huber, Jakob Vallis & Dominik Obkircher



Students: Lena Fritsch, Moritz Kahlß & Julian Duggen



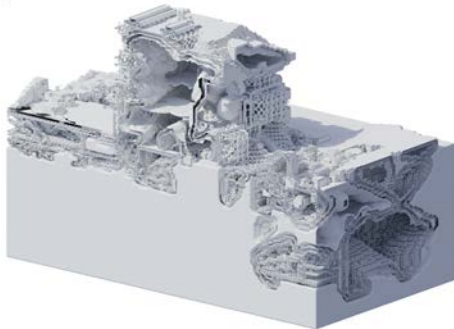
Students: Laura Vuilleumier, Julian Duggen & Dominik Valle Sieber



Students: Selena Troll, Keno Bokar Diop & Ron Kalbacher



Students: Jakob Vallis & Dominik Obkircher



Students: Tobias Albrecht & Dominik Valle Sieber



Students: Chiara Hummel & Emma Gänzer



Student: Lena Fritsch



Students: Julian Duggen & Moritz Kahlß



Student: Jolina Thomé

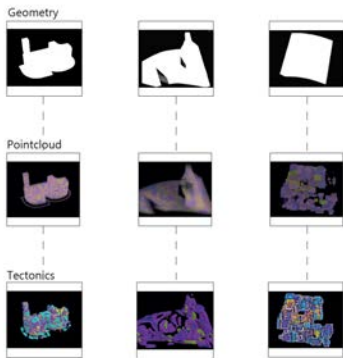


# REFERENCES

## FROM WORKFLOW TO MR-INSTALLATION (BACHELOR STUDIO 2022/2023)

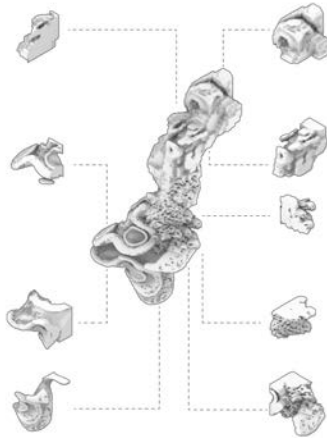
1. Interactive point cloud modeling in game engine

**Pointcloud to Tectonics**

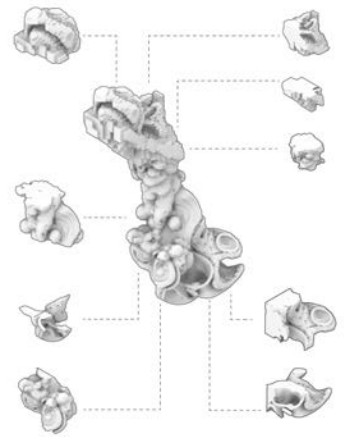


2. Digital composition from parts to whole

**Model-Composition**



**Model-Composition**



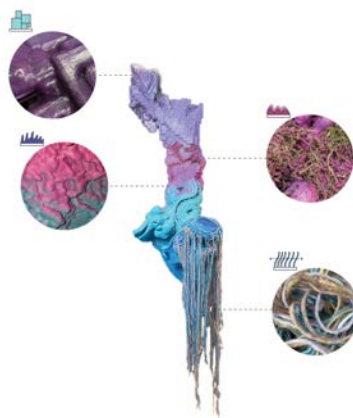
3. Atlas of haptic material for hybrid overlay

**Materialstudien**



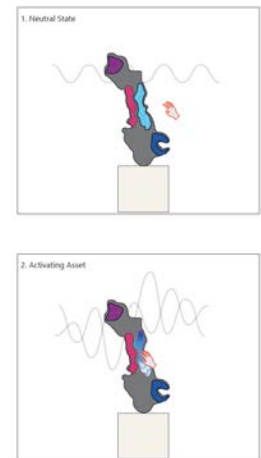
4. Physical prototype with haptic material overlay -> trigger VR

**Physical Diagram**



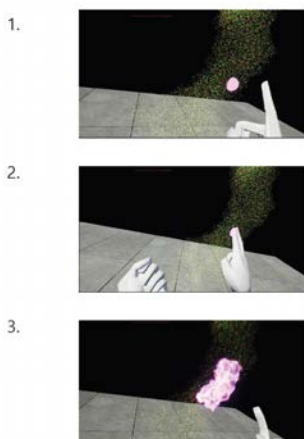
5. Concept VR-Experience

**VR-Experience**



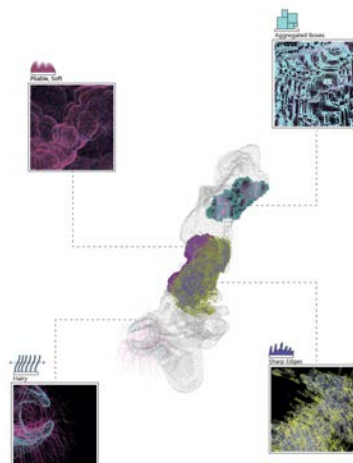
6. Coding VR-Experience

**VR-Experience**



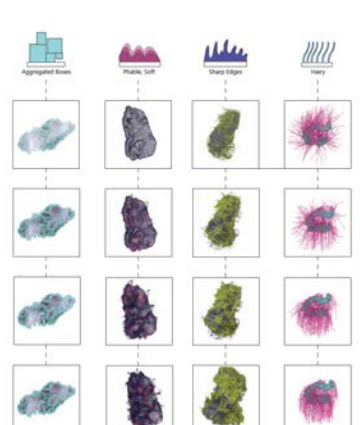
7. Phygital feedbacks

**Assets**



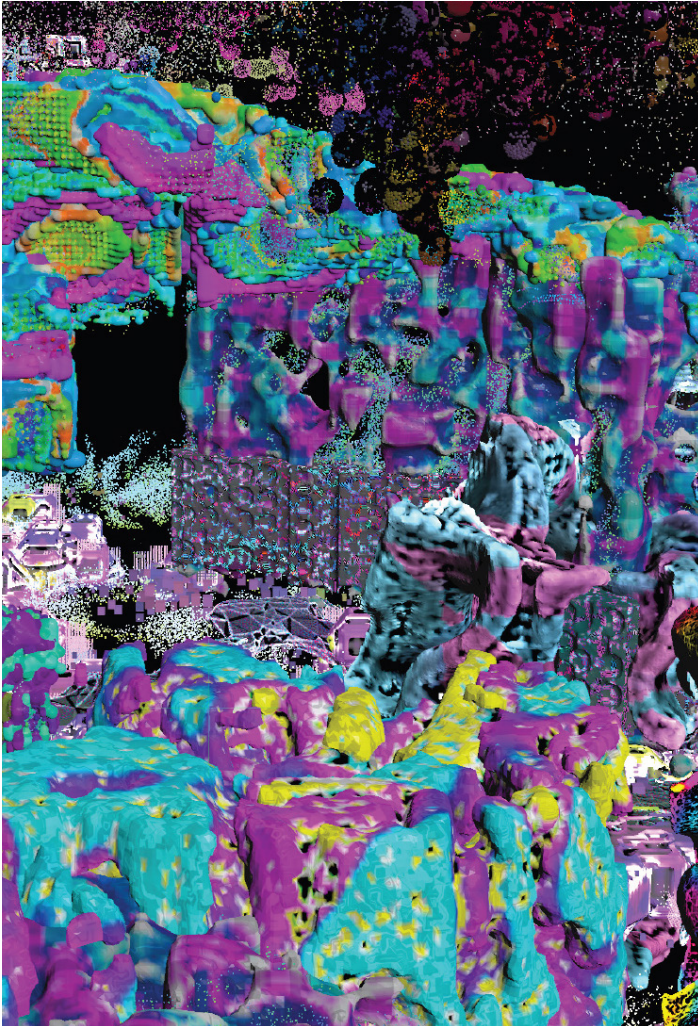
8. Atlas of experiences

**Asset Animation**





MR-INSTALLATION PHYSICAL OBJECT



MR-INSTALLATION DIGITAL WORLD

## INSTRUCTORS



Univ.-Prof. Mag. arch. Kristina Schinegger

Kristina Schinegger is a professor of structure and design and co-head of the i.sd research group at the University of Innsbruck. She is a principal investigator in the Special Research Project “Advanced Computational Design” and co-leads the SFB subproject “Computational Immediacy.” She taught at the Bartlett, UCL London, and TU Vienna and is co-founder of the practice soma architecture. Her work has been exhibited in numerous institutions such as the Venice Biennial, the FRAC Center Orleans or the MAK Vienna.



Univ.-Prof. Mag. arch. (ZT) Stefan Rutzinger

Stefan Rutzinger is professor of structure and design and co-head of i.sd at University of Innsbruck. Since 2023 he is also head of the Department of Design. He is a principal investigator in the Special Research Project “Advanced Computational Design” and co-leads the SFB subproject “Computational Immediacy.” He is co-founder of soma architecture and held academic positions at the Academy of Fine Arts in Munich, the Academy of Fine Arts in Vienna, TU Vienna, and the Bartlett School of Architecture, UCL London.



Dipl.-Ing. Johannes Schlusche

Johannes Schlusche studied architecture at the Faculty of Innsbruck and graduated in 2022 with his master thesis on ML-assisted design workflows at i.sd. He joined the robotic research lab as a senior scientist in 2022 and conducts his PhD research within the SFB subproject „Computational Immediacy“ where he focuses on ML-assisted design workflows and volumetric design strategies.



Dipl.-Ing. Kathrin Stöhr

Katrin Stöhr joined the SFB team in 2023 first as a student research assistant and conducted her master thesis with a focus on 3D point clouds as a notational system in volumetric architectural design processes in the SFB subproject „Computational Immediacy“. Since 2024 she is a PhD candidate in the SFB. Kathrin received her Bachelor in Architecture from the Berlin University of Applied Sciences.



Dipl.-Ing. Fabian Partoll

Fabian Partoll studied architecture at the University of Innsbruck and submitted his master thesis at i.sd in 2019. He worked as an architect in international offices such as Graft Architects in Berlin and Querkraft Architects in Vienna and joined i.sd as a senior lecturer in 2024. Fabian is a civil engineer and member of the Austrian Chamber of Architects.

In addition to invited international guests, Arch. Mario Gasser will give us continuous feedback during pin-ups and reviews. <https://www.mariogasser.com/>

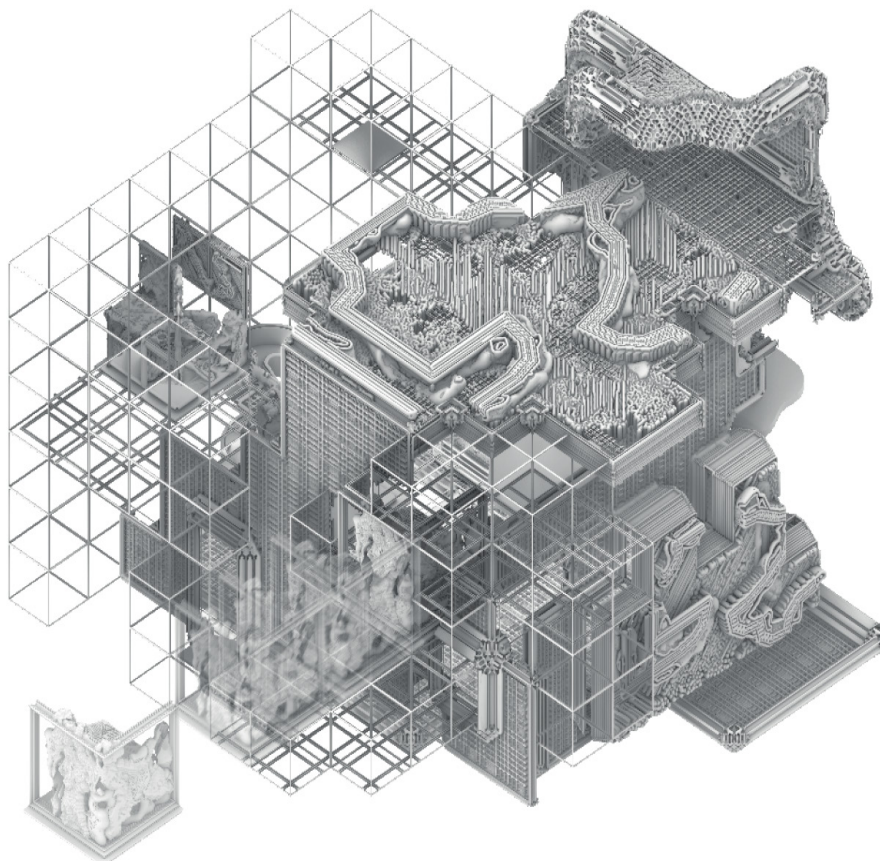
# BRIEF

## VOLUMETRIC TYPOLOGIES for Encounters between Science and the Public

In the coming year, we will design a “House of Science” that focuses on the transdisciplinary exchange between society and research and gives it a place in the center of Innsbruck. Innsbruck is a university town with a long history, but in comparison to other cities it does not have a public central location for science communication. The numerous transdisciplinary activities of the individual researchers and the diverse collections of the institutes are fragmented across many locations, without the possibility of creating “gravity” and an urban presence.

There is no “classic” typology for a house of science, so we will look at spaces of science and learn from their characteristics and their relationship to public space (from the laboratory, the conference room, the studio, the depot, the study hall, the anatomy theater, the lecture hall, the archive, the ivory tower,...). To this end, we will develop new typologies and spatial concepts and investigate the various facets and potentials of “volumetric” design: spatial complexity and entanglement, ambiguity of spaces, spatial plan and spatial sequence, multi-sensory and “deep” surfaces, hybrid functionalities, multi-materiality, high-resolution and gradual structures, performative or adaptive constructions,... you name it. At the beginning of the semester, students will articulate personal focuses and interests within “volumetric design” and implement these in a complex building design.

Volumetric design not only means that building designs are spatially complex and permeated. Above all, it also describes a design method that is being researched by i.sd and makes full use of the volumetric possibilities of digital tools. From scans of the environment, the integration of three-dimensional climate data to volumetric sketching with 3D point clouds, we will look at different possibilities in joint workshops and apply them in design studies. Volumetric thinking will allow us to look at our designs in a completely new way: as with X-ray vision, we can develop the interior and its structure simultaneously with the external formation. Decisions in the smallest detail can have repercussions on the whole and vice versa.



# BRIEF

## STRUCTURE OF THE STUDIO

### *Task 1: Volumetric Design (5 weeks)*

In individual projects, students develop a volumetric spatial concept, which is articulated in a physical “chunk model”. In preparation for this, students analyze architectural references and derive volumetric properties from them. The necessary digital methods are taught in workshops. (Previous knowledge of Rhino/GH and Houdini is not necessary).

### *Task 2: Volumetric Site Analysis and Typology Research (4 weeks)*

In parallel workshops, volumetric methods of site analysis are taught on the one hand and possible typologies for a House of Science are analyzed and discussed on the other. In groups, students develop a digital model of the environment with sketches of the urban idea and a volumetric diagram for an initial concept.

### *Task 3: House of Science - Building Design (6 weeks)*

The building ideas and volumetric concepts are further developed; spatial program, circulation, concepts for public space and exhibition design are integrated. At the end of this phase, students present a building design that will be further developed and refined in the following semester. The aim is to develop high-resolution and detailed buildings by the end of the Bachelor’s thesis and to present their innovative typology in terms of their use and curatorial display as well as their structural, material or climatic effects. The aim is for the students to set their own priorities and define the direction of the development at the beginning of the second semester.

The studio is part of a “Vertical Studio” at the i.sd. This means that the topic “House of Science” is dealt with in all design studios; however, each studio has its own focus. The focus of this studio is on the development of detailed and complex designs in the center of Innsbruck. Overarching studio activities are also planned, such as input lectures by scientists and curators, visits to reference projects and cross-reviews between the studios.