



VERTICAL ARCHIPELAGOS

Multi-level Alpine Habitats

848136 PJ Design Studio 3 (Group 1): Prof Marjan **Colletti**, Andreas **Körner**, Jade **Bailey**

Affiliated courses: SE Vertiefter Entwurf and SE Konzept und Methoden des Entwurfs

Main objective

The studio investigates *verticality* and *insularity* as distinct phenomena within architecture, aiming to merge and hybridise them in an Alpine context.

Brief

In 1972, anthropologist John Murra introduced the 'vertical archipelagos' hypothesis in his research on Andean cultures. This concept elucidates the emergence of communities within non-adjacent ecological strata. Diverse elevations yield distinct climatic conditions, resulting in advantageous enclaves and isolated pockets within a broader framework. As seasons transition and circumstances fluctuate, intermittent bridges and corridors form, uniting ecologies that would otherwise remain apart.

Historically, architectural expression is predominantly concerned with the *vertical* distribution of loads and the struggle against gravity. However, verticality also offers significant environmental opportunities beyond its advantages in terms of density and reduced ground impact (optimising land use and minimising the need for urban sprawl into green spaces or natural habitats). By stacking spaces vertically, architects can harness natural lighting and ventilation more effectively, reducing the need for excessive artificial compensation and lowering energy consumption and carbon emissions. The studio will explore the design of buildings as vertical landscaping: artificial structures placed in a natural environment. Importantly, those structures are not limited to towers but includes diverse strategies for distributing mass on terrains.

Just as *archipelagos* consist of islands scattered across a vast expanse of water, a 'vertical archipelago' involves establishing habitable zones at distinct elevations in a mountainous context. Each 'island' or habitat within this system is uniquely adapted to its altitude, climate, and ecological conditions. The idea draws inspiration from ecological diversity and sustainability principles, aiming to explore ecotones on the thresholds between human dwellings and the natural environment. As students, you will translate this concept into the Alpine environment surrounding the city of Innsbruck. The exploration will begin with analysing weather patterns and land formations, eventually evolving into

intricate tectonic frameworks, ever-evolving envelopes, and innovative spatial compositions. This process will unveil how the interplay of verticality and insularity can ingeniously harmonise, offering innovative architectural strategies that resonate with the distinctive Alpine setting. Through a series of design prototypes, you will be asked to develop a strategy to compress such considerations into smaller and more detailed units.

Wider considerations

From efficient resource utilisation to environmental conservation and research possibilities, this approach presents a holistic solution that aligns human needs with the natural environment. These considerations underscore the multifaceted benefits of a vertical archipelago concept:

- *Resource efficiency*: utilising resources available at different altitudes optimises their usage, minimising the need for long-distance transportation.
- *Climate adaptation*: by establishing habitats at varying altitudes, we can explore how building design and construction change with climate.
- *Biodiversity preservation*: a vertical archipelago can protect unique flora and fauna by creating conservation zones at different altitudes.
- *Research opportunities*: scientific research across different altitudes can yield insights into various disciplines, from climate science to biodiversity and architecture.
- *Sustainable tourism*: the diverse landscapes within the vertical archipelago could attract eco-tourism, promoting sustainable economic development.

Methods

In this design studio, students are asked to develop and apply design strategies to building design. You will organise space through material distribution and resolution. You will use simulation outputs to generate volumes and mass for architecture. You will design an architecture that operates differently across seasons and are influenced by and respond to altitude. You will create different microclimates in architecture using passive means. Furthermore, the studio will continuously evaluate the designs through three lenses:

- *Poché*: generating mass and then defining through digital drawings.
- *Ecology*: generating different environmental conditions as a programme.
- *Material*: differentiating space through texturing.

We will meet every week or second week for in-person design tutorials. Initially, feedback will be accompanied by some software teaching and mini-excursions to the site(s).

Requirements

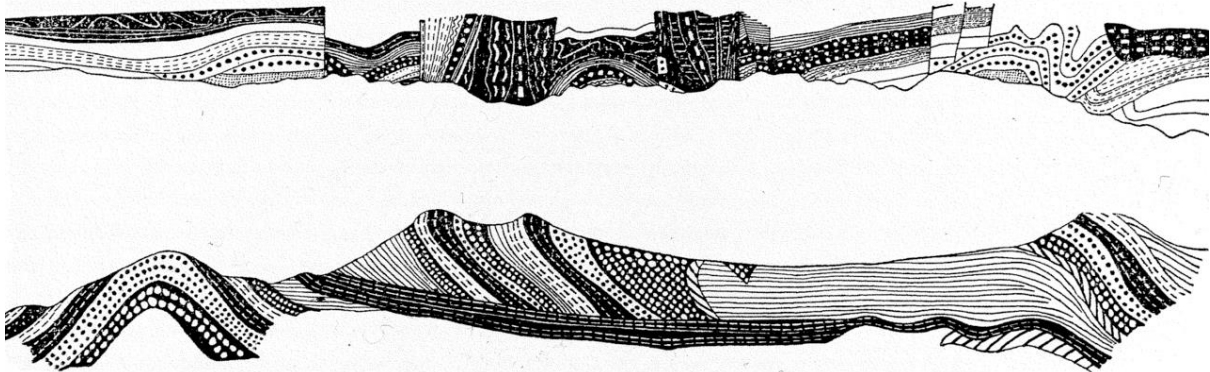
We expect an affinity for digital design tools and specifically invite those students to express their interest. While focusing on concepts and design development, we ask students to embrace the opportunities presented using advanced modelling and simulation software.



Literature

Reading the literature is integral for the design studio, and selected texts will be made available to students via OLAT. You are encouraged to engage with the literature to enrich your design projects and to establish contextual links to the history and theory of architecture:

- Berrizbeitia, Anita, William Braham, James Corner, Phu Hoang, Keith Kaseman, Cathrine Veikos, and Marion Weiss. "Surface in-Depth: Between Landscape and Architecture." In *Dirt*. Edited by Megan Born et al., 262–71. Viabooks 2. Philadelphia Cambridge: PennDesign; The MIT Press, 2012.
- Blok, Vincent. "Earthing Technology: Towards an Eco-Centric Concept of Biomimetic Technologies in the Anthropocene." *Techné: Research in Philosophy and Technology* 21, 2-3 (2017): 127–49.
- Cache, Bernard. *Earth Moves: The Furnishing of Territories*. 1995. 10th ed. Writing architecture. Cambridge: The MIT Press, 2010.
- Clément, Gilles. *Manifest Der Dritten Landschaft: Manifeste Du Tiers Paysage*. 2004. Berlin: Merve, 2010.
- Colletti, Marjan, and Peter Massin, eds. *Meeting Nature Halfway: Architecture Interfaced Between Technology and Environment*. Peer-reviewed. Innsbruck: innsbruck university press, 2018.
- Hönger, Christian, and Roman Brunner. "Strategy." In *Climate as a Design Factor: Architecture and Energy*. Edited by Tina Unruh, 34–57. Luzern: Quart Verlag GmbH, 2013.
- Ingold, Tim. *The Life of Lines*. New York: Routledge, 2015.
- Körner, Andreas. "Elevations: 49 Days of Looking onto Nature." In *Unexpected*. Edited by Mickeal Milocco Borlini and A Califano, 167–79. Urban Corporis X. Conegliano: Antefirma, 2021.
- McGuire, Mary Pat. "Is Landscape Surface?" *Journal of Landscape Architecture* 15, no. 1 (2020): 18–31.
- Rahm, Philippe. "Meteorological Architecture." *Sustainable by Design*, Münster School of Architecture, March 31, 2011. <https://www.youtube.com/watch?v=RLBCRhYIXZQ>.
- Reiser, Jesse, and Nanako Umemoto. *Atlas of Novel Tectonics*. 1st ed. New York: Princeton Architectural, 2006.
- Schwarz, Rudolf. *Von Der Bebauung Der Erde*. 1949. Salzburg, Munich: Verlag Anton Pustet, 2006.
- van Burren, Mary. "Rethinking the Vertical Archipelago: Ethnicity, Exchange, and History in the South Central Andes." *American Anthropologist* 98, no. 2 (1996): 338–51.



Rudolf Schwarz, 1949



Harold Fisk, 1944



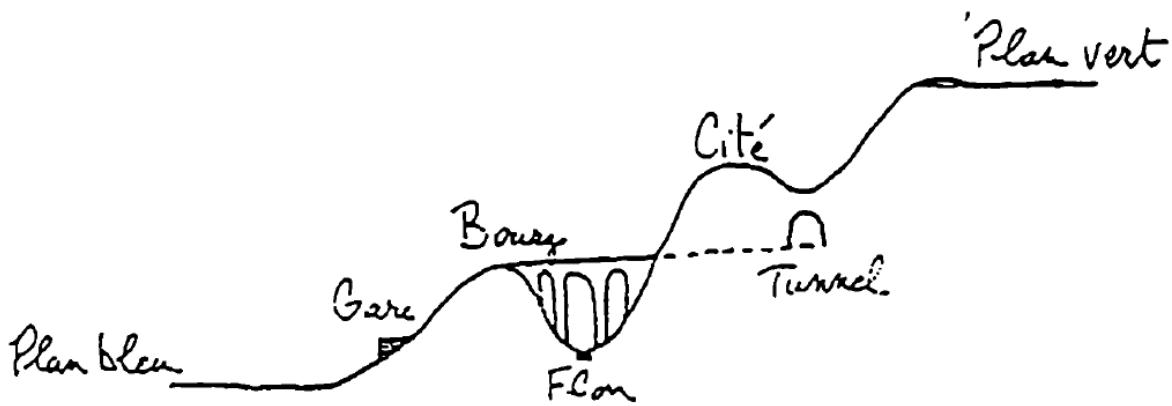
Semester 1 – Exploring verticality in the Alps

While climatic zones change over long distances in longitude and latitude, they change dramatically with altitude. The *lapse rate* describes the fall of temperature with altitude. While highly specific to each *site*, it averages about two °C per 300m altitude. As students, you are asked to identify an individual approach on the site near Innsbruck. You map the environmental conditions along a vertical path, identifying distinctive correlations between longitude, latitude, and altitude.

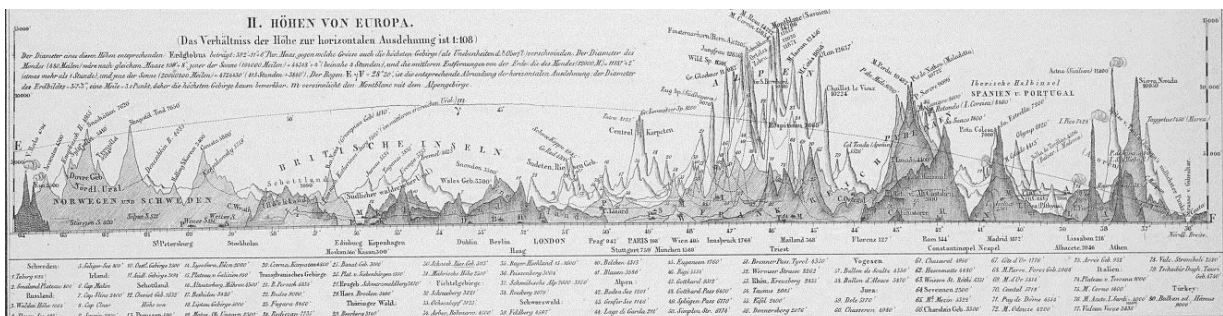
First meeting

4.10.2023, 13:00 at SR HB West (3rd floor)

<p>Throughout the first semester, you will immerse yourself in the principles of vertical architecture while embracing the distinct characteristics of the Alps. By mapping your sites, understanding environmental dynamics, drawing inspiration from case studies, and refining your morphological language, you will be well-prepared to embark on the subsequent phases of the studio. This semester lays the foundation for exploring the vertical archipelago concept and its integration within the Alpine landscape.</p>	<p>Site mapping: understanding the unique characteristics of the Alpine landscape through detailed site mapping; identifying varying altitudes, climate conditions, and potential habitats for the vertical archipelago concept.</p>
	<p>Environmental design: delving into the intricacies of texture, colour, materials, and form in architectural design, exploring how these elements interact within the context of the Alpine environment, considering both aesthetic and functional aspects.</p>
	<p>Case studies: examining relevant case studies of vertical architecture in mountainous regions, analysing their successes and challenges, and extracting valuable insights to inform your design approach.</p>
	<p>Morphological language: crafting a distinct morphological language that encapsulates the essence of verticality in the Alps, developing a visual vocabulary that conveys the interplay of natural and artificial elements within this unique context.</p>



Bernard Cache, 2010



Alexander von Humboldt, 1861

Semester 2 – Moulting tectonics of archipelagos

Each project will be designed, drawn, and modelled as a series of slices and chunks. The projects will be developed through those exemplary chunks rather than a 'complete' building design in semester 1. In semester 2, the design focus will shift to selecting and detailing selected project parts. The final models (both digital and physical) will communicate tectonic logic, the different climate zones, and how design ideas are translated across scales and expressed through detailed building designs.

In the latter phase of the studio, you will delve into the dynamic realm of archipelagos, building upon the knowledge acquired in the first semester. Your designs will emerge as dynamic solutions that harmonise with the Alpine landscape and consider the changing seasons and climatic nuances. Your structures will represent the culmination of your knowledge in architecture and environmental design, reflecting adaptability, verticality, and a profound understanding of the complex interaction between architecture and nature.

Inhabitable structures: your primary task will be to envision and design a series of inhabitable structures on the site. The scale and arrangement of these structures are left to your discretion, whether they comprise multiple smaller buildings or a singular larger complex.

Climate considerations: a pivotal aspect of this semester will be integrating different climate zones into your designs. You will explore how architecture can adapt and respond to varying climatic conditions, ensuring your structures are functional and comfortable throughout the year.

Programmatic specifics: each design proposal will be anchored in a specific program or purpose. Whether residential, commercial, recreational or a blend of functions, your designs will demonstrate a comprehensive understanding of the programme's requirements.

Hybridity and adaptability: investigate how your designs can adapt to the different seasons. From architectural elements that respond to temperature fluctuations to spaces that harness natural light differently in summer and winter, your structures will embody flexibility and functionality.

Embracing verticality: leveraging the verticality of the archipelago concept to its fullest; designing with an acute awareness of the vertical axis; capitalising on the varied altitudes to create unique spatial experiences sensitive to climate differences.



Andreas Körner, 2021