



## SUSTAINABLE SYSTEMS

Fields of Expertise TU Graz

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**Urs Leonhard Hirschberg**

Source: Lunghammer – TU Graz



**In the 24th round of the initial funding program, a total of seven proposals were submitted in the FoE Sustainable Systems, four of which we were able to fund. Surprisingly, in this round all applications were from the Faculty of Architecture. Nevertheless, the range of topics is quite wide.**

**Eva Schwab** from the Institute of Urbanism wants to team up with researchers from the Institute of Contemporary Art as well as teams at the Technical University of Leoben and ETH Zurich to apply for an Austrian Science Fund project called “Extractive urbanism in Austria: Material metabolisms and territorial futures in the Alps”. Contemporary urbanisation is inseparable from the extended material and territorial regimes that sustain it, yet Alpine territories – and Austria in particular – remain largely absent from critical debates on extraction and urbanisation. The project aims to establish a spatially grounded

and metabolically informed understanding of extractive industries as key drivers of urbanisation in Austria. Building on this analytical foundation, the project will develop speculative trajectories that critically reflect on the socio-ecological futures of extractive territories.

**Alexander Lehnerer**, who heads the Institute of Spatial Design, is planning an interdisciplinary teaching and research project for the analysis, dismantling and prototypical reconstruction of a historic lumberjack’s hut from 1903. The hut is located in the Gesäuse region of Styria, was acquired by the institute, and has to be dismantled at its original site. As a largely unaltered example of regionally typical log construction, it represents a rare and scientifically relevant object of study due to its age, structural logic and excellent state of preservation. With partners from proHolz Styria, the Institute of Timber Engineering and Wood Technology as well as the Styrian State Forests, the proposed FFG project addresses key issues of the circular economy, a resilient building culture and resource-efficient construction on a real scale.

**Matthias Lang-Raudaschl** from the Institute of Architecture Technology wants to study the production of hook-and-loop-compatible raw building components made of concrete, wood and brick. Current construction methods rely on joining techniques such as pouring, welding, gluing, foaming, and sealing. This results primarily in buildings that cannot be integrated into a circular economy,

or only partially, and even then only with considerable effort. The proposed FFG project aims to further develop a novel joining method that can be easily disassembled. It builds on extensive previous research and involves a consortium of academic and industry partners.

**Adam Sebestyen** from the Institute of Architecture and Media is proposing an Austrian Science Fund project titled “Generative AI for sustainable architectural design.” While Generative AI applications are developing rapidly, impacting many industries, the development of generative 3D applications in the field of architecture is still held back by the relative lack of 3D training datasets, the fact that there are no standardized 3D data representations within AI frameworks and no suitable generative AI models capable of embedding architectural constraints, structural reasoning or sustainability metrics. With partners from the Institute of Machine Learning and Neural Computation and from the Institute of Applied Mechanics, the proposal aims to overcome these limitations. The project proposes the development of novel constraint-aware generative neural network methods and promises a genuinely interdisciplinary research initiative spanning architecture, building construction and artificial intelligence.

We wish all applicants the best of luck with their proposals and hope that the resulting projects can one day be presented on these pages, just like the work of Udo Bachhiesl on the next pages.