

Development of new constructive solutions

Based on the knowledge of well- and suboptimal functioning structures, solutions can be improved or redeveloped. Within the framework of the doctoral program the gained insights should be tested as prototypes under realistic conditions within a second phase and ultimately brought to market maturity.

This part of product development can be carried out in close cooperation with the Fraunhofer-Institute for Building Physics. In addition, application-oriented research for the products can be made under realistic conditions until admission maturity is reached.

For the evaluation of location-based solutions, demonstration projects are to be investigated in the target regions.

Are you interested in the cooperation within the framework of the doctoral program “Climate Culture Building”? Please turn to the bottom stated address of the Technische Universität München.

We are looking forward hearing from you!

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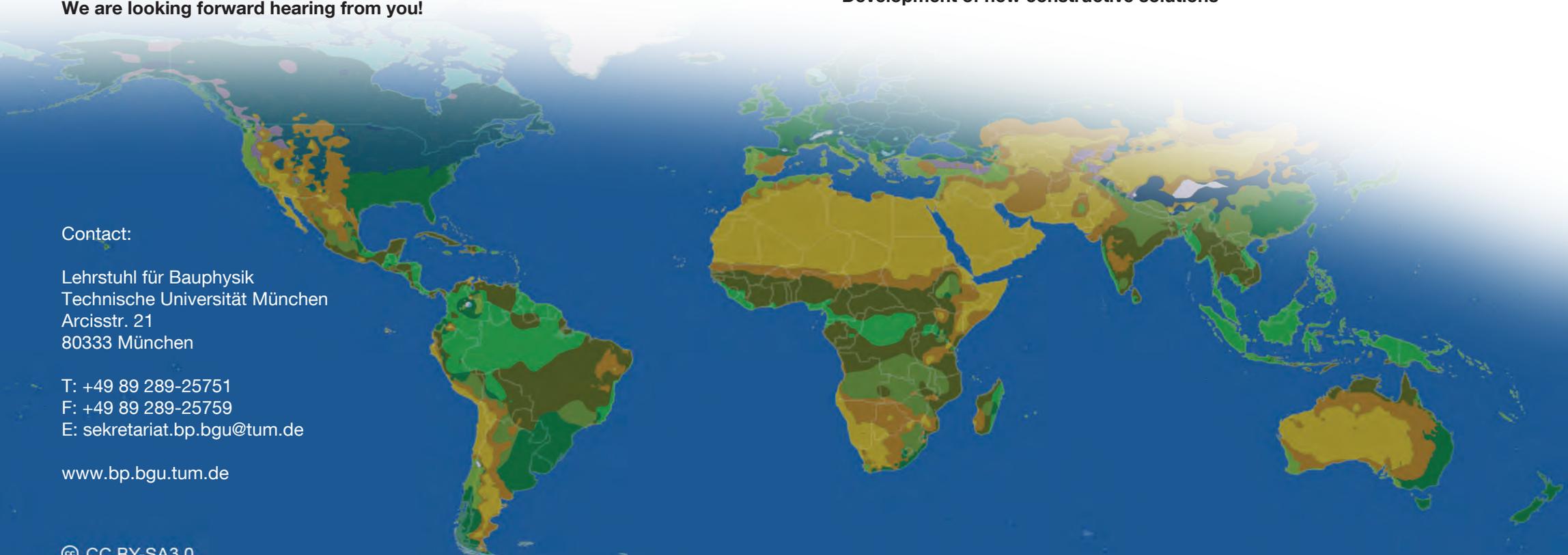
Promotionskolleg

Climate Culture Building

Basic research at the Institute for Building Physics
Head: Prof. Dr. Klaus Peter Sedlbauer

Main topics:

Indoor climate comfort
Learning from historical constructions
Development of new constructive solutions



An in Europe and worldwide unique project, the Promotionskolleg of Climate Culture Building, will be embedded in the department of building physics of the Technische Universität München. Doctoral candidates from various countries in different climates will research scientific principles of climate-adapted construction.

The objective is to align diverse socio-cultural relations with climatic conditions to develop architecture which is characteristic for the country as well as accepted by the residents while preserving the building culture. Against this background, aspects of building physics will be linked to country, climate and culture suitable construction.

Indoor climate comfort

In today's simulations, different outdoor climates can already be illustrated well on the basis of existing data. But also changes of the outdoor climate due to anthropogenic impacts become increasingly important. Thus, existing or new solutions in building constructions must be made sufficiently tolerant or adaptable to changing influences. This applies to structural components, parts, facades, buildings and whole neighborhoods.

Apart from the purely technical issues, the link between outdoor climate, indoor climate and comfort plays a central role for users. The comfort cannot be considered independently from the outside climate, as users adapt to different prevailing conditions. This can be, for example, seasonal effects as the habituation to summer or winter conditions or even adaption to particularly humid or dry conditions in the tropics or in very cold regions over many generations. From this very different effects in terms arise as to which indoor climate, is when perceived as pleasant.

Reviews that have been developed for temperate regions and their inhabitants, therefore cannot be transferred to other climate zones readily.

Especially concerning healthy living environment and favorable conditions to workplaces in buildings, in-depth knowledge is required: Socio-cultural effects and the adaptability of the users must be given equal consideration while planning buildings as well as during the use phase.

Learning from historical constructions

Historic buildings are often characterized by a number of very positive appearing aspects. A major difference to the present time is the mostly high architectural quality in terms of urban development, external effect, interior qualities, material justice, building construction and construction details. Some building types have evolved steadily over long periods and successively optimized in accordance with the regional requirements - associated functional detail solutions have been implemented using the existing building materials and construction techniques.

Of particular interest in this context is the ingenuity in which the construction problems were solved with existing resources. Nevertheless, historic buildings have often no sufficient thermal protection, moisture protection or sound proofing. In addition, the illumination with natural light does not always match the requirements that are now placed on modern building.

This raises the question, what technologies are still usable or can be improved or adapted in accordance with current requirements with the result that modern structural and economic specifications are met. This applies to the structural design as well as the material properties of the used Building Materials. Since consistently astonishing durable and well-functioning building techniques have been rediscovered like water-resistant mortar or acoustically decoupled ceiling structures, new versions of old constructions can possibly be developed.

The resulting gained insights can be used both in the renovation of valuable building stock as well as conversions or new construction.

