

This project is targeting the most prominent mountain chain in Central Europe, namely the Carpathians. Special attention is given to the development of a peculiar zone of limestone dominated rocky landscape in the Western Carpathians, known as the Pieniny Klippen Belt. Apparently, this few kilometres wide and several hundred kilometres long feature is a surface expression of much deeper structure, probably reaching down to the Earth's mantle. Such structures are not unique in mountain belts around the world and are referred to as sutures. They are commonly defined as zones of juxtaposition rock complexes exotic to each other, coming from various continental plates and often preserving a remnant of a formerly existing oceanic crust in between. Occurrence of deeply buried and subsequently exhumed rocks (so-called high pressure rocks) in such zones is also common. However, in the case of the Pieniny Klippen Belt not all of the aforementioned criteria are at first glance evidently fulfilled. For example, a remnant of a previously existing oceanic crust, the crust of the paleo-ocean Alpine Tethys is not preserved. High pressure rocks were also not found within the research target. On the other hand, this zone is undoubtedly juxtaposing rock complexes characteristic for Northern Europe and Adria province of the southern Europe, respectively. Hence, an obvious question arises whether the targeted research object is indeed a first order suture zone and if so whether the lacking puzzle pieces are buried in depth and/or removed by erosion and/or "lost" in some other way. Thus the main themes of our research project are as follows: (1) imaging of the deep crust and shallow mantle within and across the Western Carpathians using various geophysical techniques; (2) searching for remnants of the Alpine Tethys derived rocks and high pressure rocks using multiple petrological techniques; (3) establishing robust time constraints for the formation of the investigated suture zone using various modern geochronological methods based on multiple isotope systems; (4) formulation of a new evolutionary model for the disappearance of the Alpine Tethys Ocean and build-up of the Western Carpathians to make a foundation for a major change in comprehension of the geological structure of this part of Central Europe with implications for related areas and (5) dissemination of the obtained results within the research community and to wider public. The project includes research on the already obtained samples and archived geophysical data followed by the main field campaigns for sampling, structural observations and acquisition of new geophysical data. The fieldwork will be followed by laboratory works and processing of the obtained data. The project offers a unique, integrative approach to tackle several emerging issues for understanding the geological history of the Western Carpathians. It is an international initiative gathering researchers from Germany, Poland, Slovakia and Sweden in collaboration with colleagues from Canada and the USA.