Orogenic systems, including their external fold-and-thrust belts and foreland basin systems, evolve from the inversion and imbrication of former continental margins. Continental margins are characterized by displaying along-strike variations in the degree of inherited regional extension (i.e., from limited lithospheric stretching to full necking, leading to mantle exhumation and oceanic crust production). These differences have a fundamental impact on structural styles as well as the pre-shortening thermal state of the lithosphere. The presence of evaporitic sequences interacting during rift and post-rift is also a key parameter in the structural styles and deformation distribution of thrust sheets involving inverted basins. On the other hand, deformation can also be transferred ahead and downward of the shallow deformation front, leading to frontal imbrication of deep seated structures in cratonic forelands or the sub-thrust region of active fold-and-thrust belts. Defining the correct structural style of fold-and-thrust belts and understanding the controlling factors are necessary steps towards predicting their long- and short-term evolution, with implications for crustal/lithospheric rheology, mountain building processes and seismic hazard, and for the correct assessment of their potential for hydrocarbon exploration. For these reasons, fold-and-thrust belts and adjacent foreland basin systems represent outstanding places to investigate (active) deformation and surface processes and the way these processes interact to shape mountain belts. On a short-time scale, the pattern of deformation of fold-and-thrust belts provides information on crustal mechanics, the sequence of active faulting and its relation to large earthquakes; on a long-time scale, the structure and dynamics of the fold-and-thrust belt - foreland basin systems offers unique insights into the influence of structural, thermal and rheological inheritance, together with coupling between surface and deep processes. Thermochronology has recently brought new constraints on paleo-burial, exhumation and vertical movements, as well as sediment routing in fold-and-thrust belt-foreland basin systems. In addition, 2D-3D mechanical modelling has been increasingly used as a tool to validate kinematic restorations and to test the influence of varying boundary conditions and material rheology on mountain building at the lithospheric scale.

This session brings together geoscientists to present and discuss multidisciplinary approaches in which a wide range of tools are integrated. We welcome contributions reporting regional case studies and their links to hinterland portions of mountain belts, as well as more topical works on seismology, mechanics, temperature evolution, structural geology, geomorphology, exhumation and paleo-elevation, sediment transport and mass balance, surface processes and basin dynamics during pre- and syn-collision stages, together with analogue or numerical modelling approaches. We aim at providing a forum for all disciplines concerned with building and shaping of orogenic wedges by tectonics and climate to meet and discuss their views.