

## *The interplay between active tectonics, metamorphism, and the evolution of mountain belts*



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**Abstract:** The behaviour and evolution of mountain belts depend upon the interplay between the thermal and compositional effects that control the rheology. In this talk I'll discuss a range of seismological, geomorphological, petrological, and modelling approaches that, when combined, can provide a self-consistent view of the rheological evolution of mountain belts, and the effects of rheology contrasts on the deformation and long-term behaviour of mountain ranges. In particular, I will discuss the controls on the strength of the forelands underthrusting the margins of mountain ranges, the degree of mechanical coupling to the overlying fold-thrust belts, and the thermal and compositional effects that cause these parameters to vary in space and time. I will then discuss the implications of such variations for the tectonics of the interiors of mountain belts, and the geological longevity of continental cratons.

**Alex Copley** studies the deformation of continents from the scale of a mountain range down to individual earthquake events. To investigate the characteristics of earthquakes, the material properties of fault zones, and their links to topographic development of Earth's surface, he combines constraints from the field with remote sensing and models. Following his undergraduate studies at the University of Oxford, Alex received his PhD from the University of Cambridge and spent two years as a postdoctoral researcher at Caltech. Currently, he is a reader in tectonics at the University of Cambridge.

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