



## **A geodynamic model of Andean mountain building**

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The Andes mountain range in South America is the longest in the world and is unique in that it has formed at a subduction zone and not at a continent-continent collision zone. The mountain range has formed due to overriding plate shortening since the Late Cretaceous, and its origin and the driving mechanism(s) responsible for its formation remain a topic of intense debate. Here I present a buoyancy-driven geodynamic model of South American-style subduction, mantle flow and overriding plate deformation, illustrating how subduction-induced mantle flow drives overriding plate deformation. The model reproduces several first-order characteristics of the Andes, including major crustal thickening (up to double the initial crustal thickness) and hundreds of km of east-west shortening in the Central Andes, as well as a slab geometry that is comparable to that of the Nazca slab below the Central Andes. Ultimately, the geodynamic model shows that subduction-induced mantle flow is responsible for Andean-style mountain building.