

Physics & Astronomy Colloquium

Presents

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Thursday, March 4, 2021
4:10 pm via Zoom

*Meet the speaker at 3:30 pm, join us in welcoming
the speaker and for an informal chat!*

“Craton Stability: What’s Thickness (and shape) Got To Do With It”

Cratons are long-lived regions on the Earth’s continents. They are the secret keepers of Earth’s history witnessing the planet’s tectonic progression without themselves experiencing active deformation. These regions could provide clues into the Earth’s evolution if we can understand what is driving their stability. One of the first-order observations of cratons is their thick lithosphere. Though discussions around craton stability primarily focus on buoyancy and rheology, thickness also plays a primary control on both the long-lived nature of stable cratons and the demise of destroyed cratons. In other words, craton stability is determined, in part, by the material properties of cratonic lithosphere, its thermal structure, and its relative strength in comparison to the material around it and the mantle below. The integrated strength of the cratonic lithosphere, which determines its relative stability, depends on its thickness. Correspondingly, the shape of a craton (or how its thickness varies over a lateral extent) should also play a role in its overall stability. In this talk, I will summarize the connections between craton thickness and (in)stability, the limits on craton thickness, and the consequences of long-lived, thick lithosphere. Finally, I will present new work demonstrating the stability of cratons also depends on their shape.

Host: Dr. Guy Worthey

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