IGPP Virtual
Seminar Series

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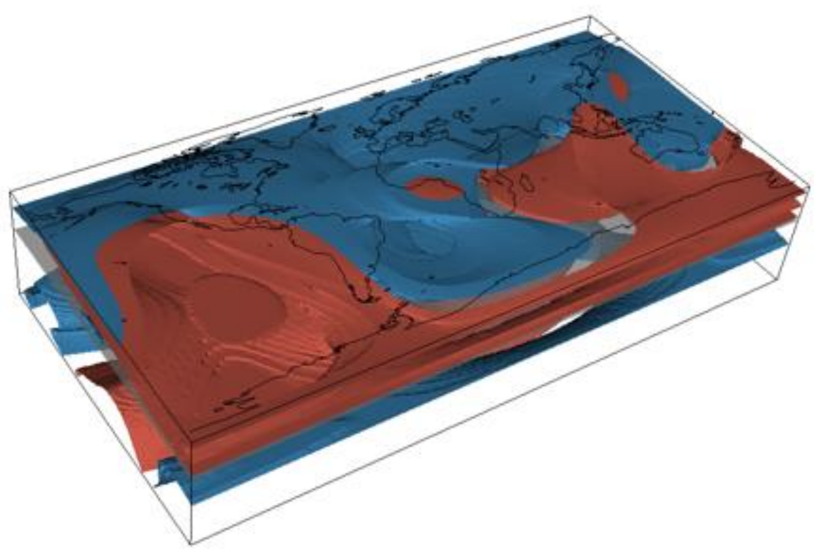
Large-scale structure of Earth's mantle and the radial viscosity profile

Date: Tuesday, September 29, 2020
Time: 12:00 pm, Pacific Time
Host: Tim Jones, t6jones@ucsd.edu
Zoom link (password = mantle): click here to join the meeting
This meeting will be recorded. Please make sure that you are comfortable with this before registering.



The viscosity of the mantle affects every aspect of the thermal and compositional evolution of Earth's interior. Radial variations in viscosity affect the sinking of slabs, the morphology of plumes, and the rate of convective heat transport and thermal evolution. Below the mantle transition zone, we detect changes in the long-wavelength pattern of lateral heterogeneity in global tomographic models, a peak in the the depth-distribution of seismic scatterers, and changes in the dynamics plumes and slabs, which may be associated with a change in viscosity. We analyze the long-wavelength structures, radial correlation functions, and spectra of four recent global tomographic models and a suite of geodynamic models. We find that the depth-variations of the spectral slope in tomographic models are most consistent with a geodynamic model that contains both a dynamically significant phase transition and a reduced-viscosity region at the top of the lower mantle. We present new inferences of the mantle radial viscosity profile that are consistent with the presence of such a feature.