# IGPP Virtual Seminar Series


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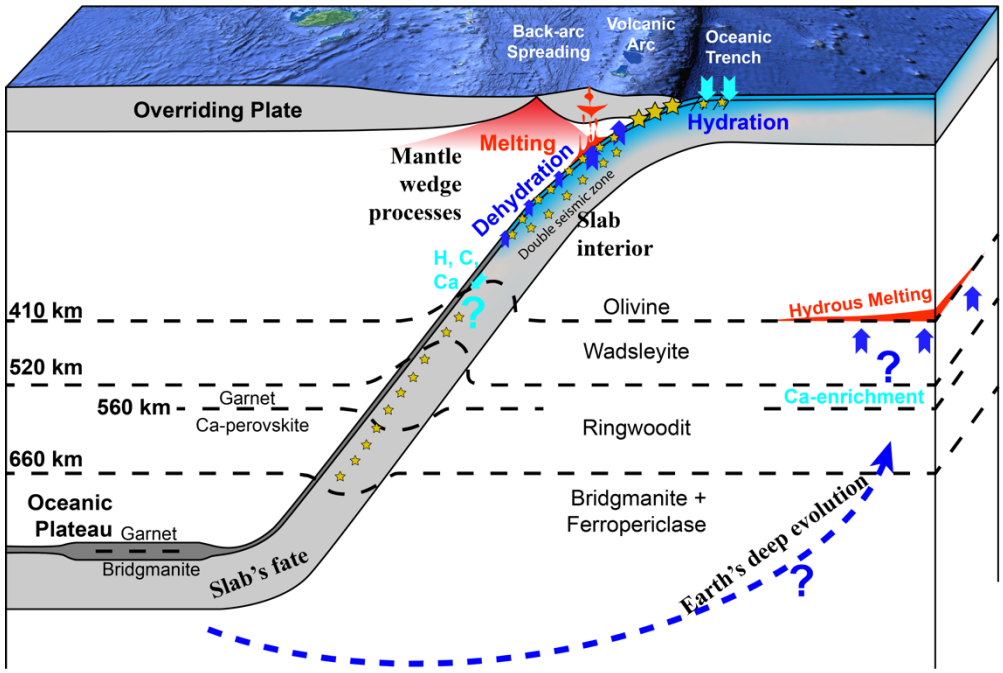
## Intermediate-depth intra-plate earthquakes and slab dehydration

**Date: Wednesday, Nov 4, 2020**
**Time: 12:00 pm, Pacific Time**
**Host: Tianze Liu (tianzeliu@ucsd.edu)**
**Zoom link:**
**https://ucsd.zoom.us/j/98707652643?pwd=ejROVFBBaXFWQTc5MDg5UTlVQXQyUT09**
**(Password: slab)**




Intermediate-depth intra-plate earthquakes are related to fluids within the subducted slab, as increased pore fluid pressure can reduce the confining pressure to allow brittle failure. The source of the free fluids is usually assumed to be either in-situ dehydration of hydrous minerals or fluids from such a source migrating for some distance. More intriguingly, double seismic zones, in which intermediate-depth earthquakes occur along two layers parallel to the

dip of the subducting slab and separated by 20-40 km, have been discovered in several subduction zones, possibly also indicating fluids in the slab mantle. Beneath the Alaska Peninsula, intermediate-depth seismicity shows significant along-strike variations, correlating with geochemical signatures of arc lavas. In the Tonga subduction zone, we discover a “seismic belt” occurring at various pressures but at a nearly constant temperature. Additionally, the source spectra of intermediate-depth and deep earthquakes suggest similar corner frequencies for these two groups of earthquakes. We also image a low-velocity layer atop the Tonga slab, indicating hydrous minerals in the slab crust and uppermost mantle.