Draft Minutes for the 1609th meeting of the Geological Society of Washington

Cosmos Club, John Wesley Powell Auditorium

April 9th, 2025

President Ved Lekić called the meeting to order at 20:04 EST.

Attendance

There were 54 attendees.

Minutes

The meeting began with the reading and approval of the minutes from the previous meeting, the 1608th meeting, which was held on March 5th.

Guests and New Members

Four guests were announced, visiting from various institutions, including the Smithsonian and the Embassy of Luxembourg. No new members were announced.

Obituaries

A moment of silence was held for Blaine Cecil (USGS), along with a remembrance shared by John Repetski (USGS). John spoke to Blaine's distinguished career as a Central Appalachian stratigrapher, noting his influential research on coal formation and paleoenvironmental reconstruction.

Announcements

Two announcements were made. President Ved Lekić announced that the Seismological Society of America 2025 Annual Meeting will take place in Baltimore next week. Liz Cottrell (Smithsonian) shared news of the recent unveiling of the Winston Red Diamond and the Winston Fancy Color Diamond Collection at the National Museum of Natural History.

Informal Communication

Steven Shirey (speaking in a personal capacity) brought one-pagers with talking points advocating for support and funding for the National Science Foundation (NSF). He emphasized the importance of NSF funding for the future of geoscience, as well as for supporting the next generation of researchers entering the field.

Formal Program

The formal program commenced at 20:17 EST and consisted of three speakers: Ryan McAleer (USGS), Wen-Lu Zhu (University of Maryland), and Emily Martin (Smithsonian National Air and Space Museum). The theme of the formal program was Rock Deformation and Tectonics.

1st formal talk: Ryan McAleer presented, "Microtextures and Microchemistry in Retrograde Shear Zones: Implications for Geochronology, Deformation Mechanisms, and Rock Strength." Ryan contextualized prograde and retrograde paths with a film analogy, noting that the retrograde path—marked by waning temperatures—lacks the conditions to easily record its journey and requires

activation energy to drive reactions. He presented case studies connecting microtextures and microchemistry to deformation history. His work touched on how the location of reactions informs their drivers, with microtextures revealing cycles of dissolution and precipitation, and Ar dating providing temporal context. This marks Ryan's return after a fire alarm foiled his scheduled talk at the 1604th GSW meeting on October 30th, 2024. In honor of the fickle fall fire alarm, several mischievous audience members (including a certain recent GSW president) set alarms to ring as he began. *Talk length: 25 minutes.*

Six questions were asked by: Peter Valley (USGS), Bill Burton (USGS), John Christoph, Dan Doctor (USGS), Jane Hammarstrom (USGS), and Bill Burton (USGS) again. Questions touched on the relative timing of shearing and dissolution, as well as whether mica-rich zones are the first to recrystallize, how argon dating constrains these processes, and how to identify optimal sampling sites in the field to capture such textures.

2nd formal talk: Wen-Lu Zhu presented, "Effect of Partial Melt on Seismic Wave Velocity of Mantle Peridotite." Wen-Lu discussed how partial melt influences seismic wave velocity and attenuation in mantle peridotite. She presented work using synchrotron-based X-ray microtomography to map 3D melt distributions and compute elastic moduli as a function of melt fraction. Her results show that the geometry and distribution of melt play a critical role in seismic wave behavior, with important implications for interpreting geophysical signals in partially molten mantle regions. *Talk length: 26 minutes.*

Five questions were asked by: Liz Cottrell (Smithsonian), Anne Pommier (Carnegie), Bill Burton (USGS), John Christoph, and Ved Lekić (UMD). Questions explored whether melt fractions beneath mid-ocean ridges might be underestimated, if tidal forces could be used to model melt distribution, connections between seismicity and aggregate properties, and how metal phases might be incorporated into the model.

3rd formal talk: Emily Martin presented, "Dione's Tectonic History and Evidence for a Global Subsurface Ocean." Emily addressed the history of tectonics on Saturn's moon Dione, using surface mapping of tectonic features to reconstruct past stress regimes and assess the moon's tectonic evolution. Her work highlights the widespread presence of extensional features—such as grabens and fracture systems—and a striking scarcity of compressional structures. She distinguished between older and younger tectonic terrains, potentially suggesting distinct episodes of deformation. *Talk length: 23 minutes.*

Eight questions were asked by: Mike Purucker (NASA), Bill Burton (USGS), unknown name (UMD), Nick Powell (USGS), Dan Doctor (USGS), John Christoph, unknown name, and Bill Burton (USGS) again. Questions touched on the relevance of Webb Telescope data, effects of rotation rate, crater deformation, tidal locking and fracture patterns, planetary comparisons, and the prevalence of extensional features.

President Lekić adjourned the meeting at 22:16 EST.

Submitted by Jessie Bersson (Smithsonian), GSW meeting secretary