

# Draft Minutes for the 1620<sup>th</sup> meeting of the Geological Society of Washington

April 29, 2026

John Wesley Powell Auditorium, Cosmos Club, DC

**President Ackerson called the meeting to order at 8:04 PM ET.**

## Attendance

There were 38 attendees in-person (no online).

## Minutes

The meeting began with announcements, then moved on to the approval of the minutes from the previous meeting (1619<sup>th</sup>). The minutes of the 1619<sup>th</sup> meeting had been posted online and a Minutes Minute was read aloud and approved.

## Guests and New Members

3 guests were announced, including Ryan Storm (UMD), Ed Ruder (Johns Hopkins University), and Dan Hummer (Southern Illinois University). No new members were announced. Currently at 171 members.

## Obituaries

Dr. Peter M. Kranz: paleontologist, teacher, & founder of the Maryland Dinosaur Park (Presented by John Repetski, USGS)

JJ (John Julian) Hemley, USGS: geochemist and earth science advocate (Presented by Jane Hammerstrom, USGS)

Priestley (Pete) Toulmin III, USGS: experimental & planetary geochemist (Presented by Jane Hammerstrom, USGS)

## Announcements

None

## Informal Communication

None

## Formal Program

The formal program commenced at 8:19 ET and consisted of three speakers: Andrea Goltz (Carnegie Earth and Planets Laboratory), Supratik Roy (Johns Hopkins University), and Kelsey Jenkins (Smithsonian Institution).

### **1<sup>st</sup> formal talk: Predicting the Stability of Igneous Amphibole using Machine Learning**

*Andrea made us all fall in love with amphiboles as an indicator of magmatic properties and ore-forming processes at subduction zones. The thermodynamic stability of amphiboles was assessed using random forest modeling, as was the accuracy of this approach (the first machine learning model to predict mineral stability!). The stability of amphibole was found to not obey the trace element threshold, so amphibole stability can't be used on its own to predict ore-forming potential.*

8:20-8:39

*Mong-Han Huang (UMD): could you use ML to predict whether a sample falls above or below the trace element threshold*

*Jamie Allen (ret.): did you account for halogens in the composition, since that can greatly affect the stability?*

*Larry Meinert (USGS): can you expand/change the model to incorporate other/additional elements, or using whole rocks?*

*Jamie Allen (ret.): are there naturally quenched environments like lakes or melt inclusions where you would have good temperature control at low pressures?*

*Maryann Malinconico (Lafayette College): why is there a gap in the subduction zone around Kashmir?*

*Mike Ackerson (Smithsonian): what about melt re-extraction*

*Liz Cottrell (Smithsonian): what's the flaw in the previous model?*

### **2<sup>nd</sup> formal talk: Constraining metamorphic rates in ancient orogens: insights from the Paleoproterozoic Lake Superior region (USA)**

*Supratik used two metamorphic nodes in Michigan to address the question of how plate tectonics has changed over the last 2 billion years. Absolute timing of magmatism in one node from U-Pb zircon dating was very accurate even for old rocks, as were dates from metasediments, showing that it took only 12 Myr to go from loose sediments to peak metamorphism. Raman spectroscopy of carbonaceous material in the other node allowed the rate of heating and metamorphism to be constrained, and mixed ages in  $^{40}\text{Ar}/^{39}\text{Ar}$  dating of detrital white mica spectra revealed diffusive loss of Ar. The similarity of results at both nodes to the Grampian Orogeny in Scotland suggests that those rocks were also formed in less than 10 Myr, indicating that short-duration metamorphism might be more common than we currently assume.*

8:48-9:10

*Liz Cottrell (Smithsonian): what is the gold standard technique for zircon U-Pb dating?*

*Mong-Han Huang (UMD): can you use your techniques to get tectonic burial rates?*

*Ross Salerno (USGS): can you translate your metamorphic rate to a geothermal gradient that can be applied to modern systems?*

*Jane Hammerstrom (ret.): how important was magmatism in short-lived events?*

*Dan Hummer (SIU): can you use K/Ar or Ar/Ar on biotite mica?*

*Mike Ackerson (Smithsonian): the lead is being lost; what controls the loss, and where's it going?*

*Larry Meinart (USGS): can you date other minerals like garnet using other techniques?*

### **3<sup>rd</sup> formal talk: Sensing in a Strange Land: The Fossil Record's Story of Sensory Evolution**

*Kelsey talked about a major transition in the fossil record: the evolution of sensory systems, and what they tell us about that animal. Ear bones first appeared in reptiles during the Permian, but they probably could only hear low frequencies through bone conduction. The degree of movement of fossil reptile ear bones was assessed by harmonic response analysis and categorized as similar to either tympanic or bone conducting hearing, supporting a single early emergence of tympanic hearing. Finally, “there are lots of ways to make a bad ear, but only one way to make a good one.”*

*9:21-9:41 (31 in-person, none online)*

*(Unknown): what were you using to characterize the attenuation?*

*Ross Salerno: what’s the evolutionary origin of the hole in the ear bone?*

*Karin Lehnigk (NASA GSFC): what causes the sharp spikes at high frequencies?*

*Mike (Carnegie): what’s the evolutionary advantage of not hearing well?*

*Mong-Han Huang (UMD): are there any reptiles alive today that have sacrificed the high frequencies?*

*Jamie Allen (ret.): when did echolocation and phase distinction emerge?*

*Kean Wilson (Carnegie): how do you account for boundaries between different materials in the bones?*

**President Ackerson adjourned the meeting at 9:51.**

Respectfully submitted by Karin Lehnigk, GSW meeting secretary