Draft Minutes for the 1577th meeting of the Geological Society of Washington
April 6, 2022
Video Conference via Zoom

President Larry Meinert called the meeting to order at 20:03 EDT.

Attendance
There were 39 attendees.

Minutes
The meeting began with the approval of the minutes from the previous meeting (1576th). The minutes of the 1576th meeting had been posted online and a Minute's Minute was read aloud at the 1577th meeting. No corrections were noted, and the minutes were accepted.

New Members and Guests

No new members were announced.

One guest was introduced: Mara Cox (Piedmont Virginia Community College).

Announcements
1. Bill Burton announced that the 2022 GSW Spring Field Trip: "Proterozoic and Paleozoic evolution of the Blue Ridge geologic province in northern Virginia" will be on Saturday, May 14th. Bill Burton and Steve Schindler will lead this trip and Alan Pitts will provide logistical support. Bill's email is posted on the GSW website for those who have questions.

Informal Communication
There was no informal communication.

Obituaries
No obituaries were announced.

Formal Program
The formal program commenced at 20:09 EDT and consisted of three speakers: Dr. Roger Fu (Dept. of Earth and Planetary Sciences, Harvard University), Dustin Trail (Dept. of Earth and Environmental Sciences, University of Rochester) and Kathleen McKee (NASA Goddard Space Flight Center).

Roger Fu presented "Exploring the Solar System Formation and the Early Earth with Novel Paleomagnetic Tools." Fu opened his talk by explaining that magnetic fields are thought to govern the dynamics of protoplanetary disks by mediating inward gas accretion and, possibly, setting up turbulent concentrations of dust to form the first planetesimals. A subset of these planetesimals then accrete to form rocky planets, which may host magnetic core dynamos and, in the case of Earth, a crust consisting of mobile tectonic plates that gave rise to a biosphere. He discussed how recent advances in paleomagnetic instrumentation have enabled access to complex meteorites and early Earth rocks that record magnetic fields in the protoplanetary disk and document the development of dynamos and plate tectonics on the Earth and Mars. Fu noted that these new techniques hold promise for challenging problems in broad areas of geomagnetism. *Talk Length: 22'00"*

Questions were asked by: Mike Purucker (NASA), Beth Doyle (NVCC) and Bill Burton (USGS Emeritus).

Dustin Trail presented "Zircon as a Window into Global and Local Environments of the Early Earth." Trail established that the environment of early Earth and conditions responsible for the emergence of life remain

unknown but there is broad consensus that our early planet was generally habitable, with low temperature water-rock interactions that may have formed the substrate upon which life arose. These planetary-scale constraints are essential, though it is reasonable to expect that key prebiotic chemistry occurred in more localized settings. He explained how his research in zircon chemistry sheds light on the global early Earth environment, and proposed potential local environments and scenarios that may have been important for prebiotic chemistry or life. *Talk Length: 21'12"*

Questions were asked by: Bill Burton (USGS Emeritus) and Phil Piccoli (UMD).

Kathleen McKee presented "Using Infrasound and Complementary Data in Remote Characterization of Large Volcanic Eruptions." McKee opened her talk by pointing out that retrospective eruption characterization is valuable for advancing our understanding of volcanic systems and evaluating our observational capabilities, especially with remote technologies (defined here as a space-borne system or non-local, ground-based instrumentation which includes regional [15-250 km range] and remote [>250 km range] infrasound sensors). Two of the largest explosive volcanic eruptions of the past decade occurred in June 2019 at Raikoke, Kuril Islands and Ulawun, Papua New Guinea volcanoes. To improve understanding of the eruptive behavior of these volcanoes her team integrated data from the International Monitoring System infrasound network, satellites (including Sentinel-2, TROPOMI, MODIS, Himawari-8), and globally-detected lightning (GLD360) with information from local authorities and social media, along with plume modeling. McKee noted that remote infrasound data provide insight into changes in eruption intensity and onset and that during both eruptions, the infrasound peak frequency decreases as the intensity increases. She explained that this may be related to changes in erupted jet and plume dynamics, such as an increase in vent diameter (observed in satellite) and that this analysis illustrates the value of interdisciplinary analysis of remote data to illuminate eruptive transitions and processes. *Talk Length: 24'45"*

Questions were asked by: Mike Purucker (NASA) and Bill Burton (USGS Emeritus).

President Meinert announced that the next meeting is at the Cosmos Club on April 27th. The pandemic situation will continue to be monitored and changes will be made, as needed. He then adjourned the 1577th meeting at 21:40 EDT.

Respectfully submitted,

Beth Doyle