First Annual Hercules Dome Ice Core Workshop & Open Science Meeting, May 10-11, 2021

Monday, May 10, 2021: All Times Eastern Daylight Time

11:00-11:40. **Welcome, Introduction, and Project Update**

Eric Steig, University of Washington (UW) – Welcome

Paul Cutler, NSF – Update from the National Science Foundation

Mark Twickler & *Joe Souney*, University of New Hampshire – Project Planning and Logistics

Jay Johnson, University of Wisconsin – Drilling technology

11:40-12:45. **Session 1: Characteristics of Hercules Dome**

T.J. Fudge (UW) & *Nick Holschuh* (Amherst College) – Site selection and ice-sheet modeling

Weisen Shen, Stony Brook U. – Seismic & thermal structure beneath Hercules Dome and why we want to know more

Tobias Staal, U. of Tasmania – Geothermal heat flow in Hercules Dome region - results & uncertainties

9:15 Breakout rooms (10 min.) followed by Panel Discussion (20 min.)

12:45-2:15. **Session 2: Motivations and context for drilling at Hercules Dome**

Marina Dütsch, University of Vienna – Response of water isotopes in precipitation to a collapse of the WAIS in high-resolution simulations with the Weather Research and Forecasting Model

Mackenzie Grieman, University of Cambridge – SkyTrain Ice Rise

Ed Brook, Oregon State University – CO_2 changes during glacial terminations and inceptions

Murat Aydin, University of California, Irvine – SPICEcore trace gas measurements and implications for the Hercules Dome project.

1:45 Breakout rooms (10 min), followed by Panel Discussion (20 min.)

2:15 **Lunch/Afternoon Break (45 min.)**

3:00-4:20. **Session 3a: Short-version talks (<5 min.)**

John Patterson, University of California, Irvine – H_2 in Ice Cores

Julia Marks-Peterson, Oregon State University – Developing high precision CO_2 measurements

Jenn Campos Ayala, University of California – Acetylene from ice cores throughout the Holocene

Vasilii Petrenko, University of Rochester – $^{14}CO_2$ to improve the radiocarbon calibration curve

Erich Osterberg, Dartmouth – Circulation changes recorded in microparticle flux, size & chemistry

3:20 Discussion (10 minutes)

Julia Andreasen, University of Minnesota – Snow accumulation time series of coastal WAIS

Thomas Chen, Academy for Mathematics, Science, and Engineering – Machine learning for climate change insights from ice core data

Erin Pettit, Oregon State University – Deformation, climate, & physical properties from borehole observations

Julien Bodart, University of Edinburgh / BAS – Age-depth stratigraphy of Pine Island Glacier

3:55 Breakout rooms (10 min), followed by Panel Discussion (15 min.)

4:20 Break (10 min.)

4:30-5:30. **Session 4: Larger Context**

Natalya Gomez, University of Montréal – Links between Antarctic ice dynamics, glacial isostatic adjustment and global sea level

Ted Scambos, University of Colorado – The International Thwaites Glacier Collaboration

5:05 Panel Discussion

5:30 End for the day

First Annual Hercules Dome Ice Core Workshop & Open Science Meeting, May 10-11, 2021
Tuesday, May 11, 2021: All Times Eastern Daylight Time

11:00-12:00. **Session 5. More on Hercules Dome characteristics**
Murat Aydin, University of California, Irvine – Welcome
TJ Young, University of Cambridge – Polarimetry methods
Ben Hills, University of Washington – Polarimetry Results at Hercules Dome
Annika Horlings, University of Washington – Surface mass balance at Hercules Dome
11:45 Discussion

12:00-1:00 **Session 6. Engagement with Antarctic Research**
Guillaume Mauger, UW – Washington Coastal Resilience Project and connecting sea level rise science to decision-makers
Peter Neff, U. of Minnesota – Role of social media in science engagement & broadening participation
Helen Glazer, Independent Artist – Art as a tool for communicating science
Gifford Wong, IDA Science and Technology Policy Institute – Science-policy interface and career pathways for science outside of academia
12:40 Discussion moderated by Heidi Roop

1:00 Break (10 min)

1:10-2:15 **Session 7: More motivations and context for Hercules Dome**
Sarah Shackleton, Princeton – Mean ocean temperature in Marine Isotope Stage 5: insight into early interglacial climate, and future work
Dave Reusch, UW – Observing and understanding precipitation, accumulation and meteorology in the Hercules Dome region
Greg Balco, Berkeley Geochronology Center – Subglacial bedrock recovery drilling and exposure dating
Marissa Tremblay, Purdue University – Noble gases in rock
2:00 Discussion (15 min.)

2:15 Lunch/Afternoon Break (45 min.)

3:00-4:20. **Session 8: Short-version talks** (<5 min., *= 10 min.)
**Juliana D'Andrilli*, Louisiana Universities Marine Consortium – Polar ice core organic matter signatures reveal past atmospheric carbon composition and spatial trends
**Paolo Gabrielli*, The Ohio State University – Elemental characterization of single mineral particles by mass spectrometry: a novel tool to infer past environmental and climate variability from ice cores
Shuting Zhai, UW – Anthropogenic Impacts on Tropospheric Reactive Chlorine since the Preindustrial
Dominic Winski, University of Maine – Holocene sea ice variability from South Pole ice core chemistry
3:30 Discussion (10 min.)
Aaron Chesler, University of Maine – The SPICEcore microparticle record.
Jihong Cole-Dai, South Dakota State University – Ice core chemical measurements - tools to date cores and to investigate ice sheet variations and ocean biogenic emissions
Andrew Pauling, UW – Non-linear modeled climate response to Antarctic topography change
Jessica Badgeley, UW – Inferring paleoaltimetry of the Antarctic Ice Sheet from ice cores
4:00 Panel Discussion (20 min.)

4:20 Break (10 min.)

4:30-5:30. **Session 9: Advances in Ice Core Research**
Christo Buizert, Oregon State University – Δage as a temperature proxy at Hercules Dome
Laurence Yeung, Rice University – Using the ice-core record to investigate the ancient free troposphere
5:05 Panel Discussion

5:30 *Hercules Dome Leadership Team* – Wrap up/next steps.