OPAG Meeting Agenda
August 30–September 1, 2021
Virtual Meeting

Times listed are U.S. Pacific Daylight Time (PDT) and Eastern Daylight Time (EDT)

Monday, August 30

PDT	EDT	Presenters	Topic
9:00 a.m.	12:00 p.m.	Linda Spilker (JPL), Jeff Moore (NASA ARC), OPAG Co-Chairs	Welcome, Agenda Overview, Meeting Goals, and Review Findings Recording
NASA Headquarters Briefings			
9:15 a.m.	12:15 p.m.	Henry Throop (NASA HQ)	NASA Planetary Science Division Update Recording
10:00 a.m.	1:00 p.m.		Headquarters Q&A Recording
10:15 a.m.	1:15 p.m.	June Zakrajsek (NASA Glenn Research Center)	RPS Program Technology Updates Presentation Recording
10:45 a.m.	1:45 p.m.		**Break**
11:00 a.m.	2:00 p.m.	Caroline Wilson (NASA OCS)	Demographic Data Briefing Update Presentation Recording
11:20 a.m.	2:20 p.m.	Fran Bagenal (LASP) and Orlando Figueroa (Orlando Leadership Enterprise)	Decadal Survey State of the Professional Working Group Briefing Presentation Presentation Stats Recording
11:40 a.m.	2:40 p.m.	Town Hall Discussion and Questions for Day 1 Talks Recording	
Social Hour and Poster Preview			
1:10 p.m.	4:10 p.m.	Social Hour and Poster Preview (Gather.town). Posters open all day for viewing (listed below).	
3:00 p.m.	6:00 p.m.		**Adjourn**

Tuesday, August 31

PDT	EDT	Presenters	Topic
Decadal Survey and Future Program Updates			
9:00 a.m.	12:00 p.m.	Ian Cohen (APL)	NASA Cross-Divisional Interest in an Ice Giant Mission Presentation Recording
9:15 a.m.	12:15 p.m.	Chris Arridge (Lancaster University)	ESA Voyage 2050 Presentation Recording
9:30 a.m.	12:30 p.m.	Philip Christensen (ASU) and/or Robin Canup (SwRI)	Decadal Survey Briefing and Update Recording
9:45 a.m.	12:45 p.m.	Town Hall Discussion and Questions for Earlier Talks Recording	
10:15 a.m.	1:15 p.m.		**Break**
Approved Outer Planet Mission Updates			
10:30 a.m.	1:30 p.m.	Alan Stern (SwRI)	New Horizons Update Presentation Recording
10:45 a.m.	1:45 p.m.	Haje Korth (APL) and Jordan Evans (JPL)	Europa Clipper Update Presentation Recording
11:00 a.m.	2:00 p.m.	Zibi Turtle (APL)	Dragonfly Update Presentation Recording
11:15 a.m.	2:15 p.m.	Scott Bolton (SwRI)	Juno Update
11:30 a.m.	2:30 p.m.	Town Hall Discussion and Questions for Earlier Talks Recording	
12:30 p.m.	3:30 p.m.	**Instruments** -Ronald Freeman -Geoffrey Landis -Shannon MacKenzie -Jose Santos **Science** -Julie Castillo-Rogez -Mathieu Choukroun -David DeColibus	Lightning Talks for Poster Session (2 minutes each) Recording Recording Recording Recording Recording Recording Recording

		-Kathryn Gansler -Rudi Lien -Brian Murphy -Andrew Sontag -Zachary Ulibarri -Brandon Coy **Technology and Modeling** -Aaron Brandis -Tiago Vaquero -Kathleen Craft -Hilary Justh -Earl Maize -Matt Gasch	Recording Recording Recording Recording Recording Recording Recording Recording Recording Recording Recording Recording
Poster Session			
1:30 p.m.	4:30 p.m.	Poster Session in Gather.town	
3:00 p.m.	6:00 p.m.		**Adjourn**

Wednesday, September 1

PDT	EDT	Presenters	Topic
Other Mission and the Candidate Mission Updates			
9:00 a.m.	12:00 p.m.	Tom Brown and Heidi Hammel (STScI/AURA)	HST Update and Future of Planetary Observations with Space Telescopes Presentation Presentation Recording
9:20 a.m.	12:20 p.m.	Ken Hurst (JPL)	Ocean Worlds Technology Development Updates (ICEE-2, etc.) Presentation Recording
9:40 a.m.	12:40 p.m.	Kirby Runyon (APL)	Interstellar Probe as Enabling for Outer Solar System Flybys Presentation Recording Recording
10:00 a.m.	1:00 p.m.	Andrew Shaner (LPI)	*Planetary Resources and Content Heroes (ReaCH)* Presentation Recording
10:20 a.m.	1:20 p.m.	Alyssa Rhoden (SwRI)	Network for Ocean Worlds (NOW) Recording
10:40 a.m.	1:40 p.m.	Britney Schmidt (Georgia Institute of Technology)	Network for Life Detection (NFoLD) Presentation Recording
11:00 a.m.	2:00 p.m.		**Break**
11:20 a.m.	2:20 p.m.	Panelists: Louise Prockter, Alfred McEwen Moderator: Jeff Moore	Panel Discussion: Enabling Outer Planet Missions in Discovery Recording
11:35 a.m.	2:35 p.m.	Town Hall Discussion, Questions for Earlier Talks, New OPAG Findings Recording	
1:05 p.m.	4:05 p.m.		**Adjourn**

Posters

Poster Locator	Authors	Title
Instruments and Mission Concepts		
A-1	Freeman R. H.	*2023-2032 Planetary Science and Astrobiology Decadal Survey: A Smallsat Proposal for Ocean Worlds Program* **[#6007]** The overarching OWP goal is to identify ocean world, including subsurface oceans. This poster aims to provide notional smallsat architectures for implementing ISRU and technologies of communications, data rates, and power supply to an OW mission.
A-2	Landis G. A. Oleson S. R. Turnbull E. Smith D. McCarty S. Faller B. Fittje J. Gyekenyesi J.	*Abeona: Design of a Nuclear-Electric Vehicle for Transport to Neptune and Triton* **[#6017]** We have done a design study of a Nuclear Electric Propulsion (NEP) transport vehicle for transportation from Earth orbit to Neptune and Triton.

A-3	MacKenzie S. M. Neveu M. Davila A. F. Lunine J. I. Cable M. L. Eigenbrode J. L. Gold R. Phillips-Lander C. M. Hofgartner J. D. Waite J. H. Glein C. R. McKay C. P. Orbilander Team	*Enceladus Orbilander: A Mission Concept Study to Search for Signs of Life* **[#6012]** Ocean-fed plume awaits./Does Enceladus host life,/Orbilander asks.
A-4	Santos J. Brandis A. Hwang H. Gulhan A. Thiele T. Siebe F.	*Overview of Dragonfly Entry Aerosciences Measurements (DrEAM)* **[#6016]** An overview of the Dragonfly Entry Aerosciences Measurements (DrEAM) project for the New Frontiers 4 Dragonfly mission to Titan is provided.
Science		
B-1	Castillo-Rogez J. C. Melwani Daswani M. Glein C. Vance S. Cochrane C.	*Role of Non-Water Ices in Driving Salinity and Electrical Conductivity in Ocean Worlds* **[#6010]** Ices abundant in the far outer solar system (e.g., CO, CO_2) can significantly contribute to the salinity of ocean worlds (e.g., bi/carbonates ions), much more than chlorides and sulfates, and produce electrical conductivities of several S/m.
B-2	Choukroun M. Backes P. Cable M. L. Fayolle E. C. Hodyss R. Murdza A. Schulson E. M. Badescu M. Malaska M. J. Marteau E. Molaro J. L. Moreland S. J. Noell A. C. Nordheim T. A. Okamoto T. Riccobono D. Zacny K.	*Sampling Plume Deposits on Enceladus' Surface to Explore Ocean Materials and Search for Traces of Life or Biosignatures* **[#6020]** We present the science rationale for exploring plume deposits on Enceladus' surface and a sampling system in development to achieve this that could be considered for Enceladus surface mission concepts.
B-3	DeColibus D. R. Chanover N. J. Cartwright R. J.	*Is the Longitudinal Distribution of Water Ice on Miranda Different Compared to the Other Uranian Satellites?* **[#6014]** We acquired new near-IR spectra of the surface of the smallest Uranian classical satellite, Miranda. Our results show that the longitudinal distribution of water ice on Miranda is unusual compared to the other Uranian satellites.
B-4	Gansler K. R. Liles C. A. Nixon C. A.	*Machine Learning Detection of Chaos Terrain on Europa as a Proof-of-Concept for Use with Future Data* **[#6011]** A U-net neural network was applied to images of Jupiter's moon Europa's Chaos Terrains to automatically detect irregular ice floes, which will accelerate scientific analysis of higher resolution images expected from Juno and Europa Clipper.
B-5	Lien R. R. Craft K. L. Walker M.	*Tidally Induced Ice Shell Fracturing and Faulting at Europa and Implications for Future Subsurface Missions* **[#6005]** Tidal stresses imposed within Europa's ice shell initiate surface fracturing. Motion along these fractures could be hazardous for future subsurface missions, so we used finite element models to quantify net displacement along fracture edges.
B-6	Murphy B. P. Steffens B. L. Bauduin S. Bjoraker G. L. Nixon C. A. Irwin P. G. J.	*Spatial and Temporal Variation of Water in Titan's Atmosphere* **[#6015]** NASA Goddard Space Flight Center intern, and Planetary Sciences undergraduate, Brian Murphy worked with Dr. Conor Nixon, Dr. Gordon Bjoraker, Dr. Sophie Bauduin, and Brenden Steffens to model and retrieve water vapor abundances in Titan's atmosphere.
B-7	Sontag A. Clark G. Kollmann P.	*Charge Exchange Ion Losses in Saturn's Magnetosphere* **[#6006]** We develop a physical model of charge exchange and compare its predictions to measured ion intensity data in Saturn's magnetosphere to evidence charge exchange's role as the dominant loss process in this region.

B-8	Ulibarri Z. Munsat T. Abel B. Dee R. Kempf S. Sternovsky Z. Voss M.	*Detection of Organic Molecules and D-H Ratios in Laboratory Mass-Spectra of Hypervelocity Dust Impacts into Ice* **[#6021]** A new method of ice creation at the CU Boulder dust accelerator has enabled detailed study of the ability of TOF instruments on flyby spacecraft to measure complex organics and their breakup products as well as the D-H ratio of icy dust grains.
B-9	Coy B. P. Nixon C. A. Rowe-Gurney N. Achterberg R. Fletcher L. N. Irwin P.	*Compositional Analysis of Titan's Atmosphere Using Spitzer Infrared Spectrograph Data* **[6022]** We present infrared spectra from the Spitzer space telescope (2004-2008) of Titan showing the emissions of various organic gases and compare the results obtained for Titan from Spitzer to those of the Cassini CIRS. We conclude by identifying gaps in spectroscopic knowledge of molecular bands.
Technology and Modeling		
C-1	Brandis A. Barnhardt M. Hughes M. Korzun A. West T. Wright M.	*Impact Of NASA'S Entry Systems Modeling Project on Planetary Mission Design* **[#6009]** Overview entry, descent, and landing technology research happening within NASA's Entry Systems Modelling project.
C-2	Castano R. Vaquero T. Rossi F. Allard D. Amini R. Barrett A. Castillo-Rogez J. Chien S. Choukroun M. Dadaian A. Dhamani N. Francis R. Hewitt R. Hofstadter M. Ingham M. Sorice C. Van Wyk E.	*Operations for Autonomous Spacecraft: A Neptune Tour Case Study* **[#6019]** Onboard autonomy capabilities hold promise to enable and enhance future missions. This effort addresses the impact of such capabilities on ground operations and the challenge of operating these spacecraft in the context of a Neptune tour mission.
C-3	Craft K. L. German C. R. Jakuba M. V. Lien R. R. Lorenz R. D. McCarthy C. Patterson G. W. Rhoden A. R. Silvia M. Singh V. Walker M. Farr N. Freitag L. McRaven C. Partan J. Coker R. Asenath-Smith E. Lever J.	*Updates on the Sending Signals Through the Ice (STI) Project for an Ice-Ocean Probe at Europa and Ocean Worlds* **[#6018]** The Signals Through the Ice (STI) project is working to develop a robust communication architecture for transmitting data collected by the descending ice probe up to the surface lander for transmission back to Earth.
C-4	Justh H. L. Dwyer Cianciolo A. M. Aguirre J. T. Diekmann A. Hoffman J. Powell R. W.	*Outer Planet Global Reference Atmospheric Model (GRAM) Upgrades* **[#6003]** The Global Reference Atmospheric Model (GRAM) is one of the most widely used engineering models of planetary atmospheres. This presentation summarizes the Outer Planet GRAM upgrades, the upgraded and new GRAM releases, and future upgrade plans.
C-5	Maize E. H.	*Update on Advanced Development Initiatives for Europa Lander and Other In-Situ Ocean World Missions* **[#6013]** Update on the advanced development effort for high risk and/or low TRL capablities for a Europa Lander or other oceans world landers particularly with extreme envirnoments. Original poster presented at Fall meeting 2019.
C-6	Venkatapathy E. Gasch M. Prabhu D. Allen G. Hwang H.	*Next Generation Thermal Protection Systems for Outer Planet Missions* **[#6008]** We present TPS developments to further reduce mass fraction by about ~ 50% for Saturn probe missions and enable new mission architectures for aerocapture enabling Ice Giant Orbiter with probes and landers.