5th Planetary Data Workshop and
Planetary Science Informatics and Data Analytics (PSIDA) Meeting

June 28–July 2, 2021
Virtual

Program and Abstracts

The meeting is scheduled to begin each day at 7:00 a.m. Pacific Daylight Time (PDT)/10:00 a.m. Eastern Daylight Time (EDT)/2:00 p.m. UTC. Birds-of-a-feather discussions scheduled outside normal meeting hours will begin at 6:00 a.m. PDT/9:00 a.m. EDT/1:00 p.m. UTC. For different time zones, use: Time Zone Converter.

Monday, June 28, 2021

PDT	EDT	UTC	
7:00 a.m.	10:00 a.m.	2:00 p.m.	AV Tools: Analysis and Visualization Tools, Current or New Algorithms and Methods
8:00 a.m.	11:00 a.m.	3:00 p.m.	Poster Session 1: Analysis and Visualization Tools, Current or New Algorithms and Methods
9:00 a.m.	12:00 p.m.	4:00 p.m.	Processing Session 1: Processing Capabilities and Pipelines
10:00 a.m.	1:00 p.m.	5:00 p.m.	Data Processing: Data or Software Architecture, Management, and Interoperability
10:45 a.m.	1:45 p.m.	5:45 p.m.	Birds-of-a-Feather: Geospatial Pipelines
12:00 p.m.	3:00 p.m.	7:00 p.m.	Adjourn

Tuesday, June 29, 2021

PDT	EDT	UTC	
6:00 a.m.	9:00 a.m.	1:00 p.m.	Birds-of-a-Feather: AI, Solar, and Lunar Eclipses
7:00 a.m.	10:00 a.m.	2:00 p.m.	PSA: Data or Software Architecture, Management, and Interoperability
8:00 a.m.	11:00 a.m.	3:00 p.m.	Keynote: Planetary Data Ecosystem Independent Review Board Findings
9:00 a.m.	12:00 p.m.	4:00 p.m.	Data and Methods: Analysis and Visualization Tools, Current or New Algorithms and Methods
10:00 a.m.	1:00 p.m.	5:00 p.m.	Updates: Data or Software Architecture, Management, and Interoperability
10:45 a.m.	1:45 p.m.	5:45 p.m.	Birds-of-a-Feather: PDS4 and PDE Findings
12:00 p.m.	3:00 p.m.	7:00 p.m.	Adjourn

Wednesday, June 30, 2021

PDT	EDT	UTC	
6:00 a.m.	9:00 a.m.	1:00 p.m.	Birds-of-a-Feather: Reproducible Scientific Results
7:00 a.m.	10:00 a.m.	2:00 p.m.	Science Data: Data or Software Architecture, Management, and Interoperability
8:00 a.m.	11:00 a.m.	3:00 p.m.	Cloud: Big Data, Cloud Computing, and Scalable Computing
9:00 a.m.	12:00 p.m.	4:00 p.m.	AI/ML: Artificial Intelligence and Machine Learning
10:00 a.m.	1:00 p.m.	5:00 p.m.	Poster Session 2: Artificial Intelligence, Machine Learning, Cloud, and Other
11:00 a.m.	2:00 p.m.	6:00 p.m.	Birds-of-a-Feather: Cloud
12:00 p.m.	3:00 p.m.	7:00 p.m.	Adjourn

Thursday, July 1, 2021

PDT	EDT	UTC	
6:00 a.m.	9:00 a.m.	1:00 p.m.	Birds-of-a-Feather: Geologic Mapping
7:00 a.m.	10:00 a.m.	2:00 p.m.	PDS Tools: Data Archiving and Distribution Services; Hands-On Training and How-To Guides
8:00 a.m.	11:00 a.m.	3:00 p.m.	Analysis and Processing: Analysis and Visualization Tools, Current or New Algorithms and Methods
9:00 a.m.	12:00 p.m.	4:00 p.m.	Keynote: Removing Barriers and Increase Inclusivity in the Planetary Science Community
10:00 a.m.	1:00 p.m.	5:00 p.m.	Pythons and APIs: Data or Software Architecture, Management, and Interoperability
10:45 a.m.	1:45 p.m.	5:45 p.m.	Birds-of-a-Feather: PlanetaryPY — A Community Resource
12:00 p.m.	3:00 p.m.	7:00 p.m.	Adjourn

Friday, July 2, 2021

PDT	EDT	UTC	
6:00 a.m.	9:00 a.m.	1:00 p.m.	Birds-of-a-Feather: Stereo and Topography (ASP, Socet GXP, Topographic Data)
7:00 a.m.	10:00 a.m.	2:00 p.m.	Analysis Data: Data or Software Architecture, Management, and Interoperability
8:00 a.m.	11:00 a.m.	3:00 p.m.	Poster Session 3: Data Archiving and Distribution Services; Hands-On Training and How-To Guides
9:00 a.m.	12:00 p.m.	4:00 p.m.	Spectral: Analysis and Visualization Tools, Current or New Algorithms and Methods
10:00 a.m.	1:00 p.m.	5:00 p.m.	Processing Session 2: Analysis and Visualization Tools, Current or New Algorithms and Methods
10:45 a.m.	1:45 p.m.	5:45 p.m.	Adjourn

Print Only

Monday, June 28, 2021

AV TOOLS: ANALYSIS AND VISUALIZATION TOOLS, CURRENT OR NEW ALGORITHMS AND METHODS

7:00 a.m. PDT/10:00 a.m. EDT/2:00 p.m. UTC

Tools supporting rovers, small bodies, and exosystem studies.

Chair: Trent Hare

*Authors (*Denotes Presenter)*	*Abstract Title and Summary*
Hare T. * Stein T. *	*Welcome and Introductions*
Calef F. J. III * Soliman T. Roberts J. Chung A. Abarca H. Dahl L.	*NASA AMMOS Multi-Mission Geographic Information System (MMGIS) Version 2.0: Updates and Mission Operations* **[#7061]** The Multi-Mission Geographic Information System (MMGIS) is a free and open source geospatial (FOSS4G) web application developed by NASA AMMOS, deployed on four Mars missions plus one Earth project with refactored code, new tools, and enhancements.
Seignovert B. * Altobelli N. Belgacem I. Robidel R. Tobie G. Vallat C.	*Planning Science Opportunities with the JUICE Moon Coverage Tool* **[#7094]** The moon-coverage tool provides an overview of the observation opportunities of the Jupiter's moons for the JUICE mission.
Steele R. J. * Lopez N. R. Peachey J. M. Ernst C. M. Barnouin O. S. Daly R. T. Martin A. C.	*The Small Body Mapping Tool (SBMT) for Accessing, Visualizing, and Analyzing Spacecraft Data in Three Dimensions: 2021 Update* **[#7100]** The Small Body Mapping Tool (SBMT) is used to find, access, and visualize data on small body shape models. Here, we present improvements to the tool over the last several years in areas including DTMs, planning, and overall performance.

Zinzi A. * Turrini D. Alei E. Verrecchia F.	*ExoplAn3T, the Novel Tool for Exosystems Studies* **[#7019]** ExoplAn3T is the SSDC scientific webtool designed to provide a unified and intuitive interface to access to multiple on-line exoplanet catalogues and optimized for the study of exoplanetary systems as global entities.
Zhou F. * Stein T. Arvidson R. E. Wang J.	*Supporting Location and Measurement Functions on Curiosity Rover Mosaics in the Analyst's Notebook* **[#7053]** The Analyst's Notebook Image Viewer tool provides functions to visualize and explore MSL mosaics, including source frame identification, measurements, and ground location identification to the planetary science community for use with archived data.

Monday, June 28, 2021
POSTER SESSION 1: ANALYSIS AND VISUALIZATION TOOLS, CURRENT OR NEW ALGORITHMS AND METHODS
8:00 a.m. PDT/11:00 a.m. EDT/3:00 p.m. UTC
Moderator: Trent Hare

Authors (*Denotes Presenter)	*Abstract Title and Summary*
Barbarisi I. * Arenas J. Casquero F. Docasal R. Montero A. Osinde J. Raga F. Ruano J. Saiz J. Merin B. Besse S. Bentley M. Coia D. Fraga D. Giordano F. Grieger B. Grotheer E. Heater D. Lim T. Manaud N. Martinez S.	*PSA 2020: Toward the Discovery of ESA Planetary Data Through 2D and 3D Interfaces* **[#7028]** We present the main use cases and the architecture of both the 3D Interface for Comet 67-P/Churyumov-Gerasimenko and the 2D Map View for Mars developed for the European Planetary Science Archive.
Collins M. C. *	*Modeling Titan Using ROCKE-3D Global Circulation Model* **[#7001]** I am updating the ROCKE-3D model in order to visualize large-scale dynamics on Saturn's moon Titan, and representing its methanological system in order to understand how different parameters may affect the production and location of organics.
Cornet T. * Bentley M. S. Macfarlane A. J. Moss R. Martínez S. Cuevas M. A. Fajersztejn N. Freschi M. Galan D. Gallegos J. Vallejo F. Science Ground Segment	*BepiColombo Data Analysis Ecosystem: Quick-Look and Science Analysis Forum* **[#7033]** We present the development status and plans of the BepiColombo Science Ground Segment quick-look analysis web-interface and science analysis forum used for rapid analysis of the data during operations, and support collaborative science between teams.
Emran A. * Chevrier V. F. Ahrens C. J.	*A New Methane Spectral Index from NASA's New Horizons Ralph/MVIC Instrument* **[#7007]** We propose a new CH_4 spectral index from NASA's New Horizons Ralph/MVIC instrument data to map methane distribution on the surface of Pluto.
Frasier C. * Keszthelyi L.	*Planetary Image Editor I/O-Web Service* **[#7049]** The USGS Astrogeology Science Center is developing the Planetary Image Editor (PIE), an I/O Web Service that can be used by researchers to create publication ready figures from images found and processed using the PILOT and POW web services.

Frigeri A. *	*Gsymblib: A Geologic Mapping Symbol Library and Development Environment for QGIS* **[#7105]** The gsymblib aims to bring the necessary styles, patterns, colors, and fonts for a complete representation of geologic maps in QGIS, facilitating also the process of growing and improving the library by collaborative efforts.
Garland J. * Sayanagi K. M. McNabb J. W. C. McCabe R. M.	*Saturn's Equatorial Jet Through Reanalysis of Newly Navigated Voyager Data* **[#7090]** We re-analyzed calibrated, re-navigated Voyager ISS and Cassini ISS data to investigate the long-standing discrepancy in Saturn's equatorial jet speed. We also provide open-source tools to reproduce our datasets from publicly available PDS data.
Million C. C. * St. Clair M. Aye K. M. Padams J.	*The Planetary Data Reader (pdr): A Python Toolkit for Reading Planetary Data* **[#7096]** We are developing the Planetary Data Reader (pdr), an open-source, Python-based tool for the ingestion of planetary observational data into planetary science workflows.
Schorghofer N. *	*Mars Thermal Model for Mega-Pixel Digital Elevation Models* **[#7005]** A thermal model for rugged terrain is introduced that is computationally fast enough to calculate surface temperatures over multiple Mars years for DEMs that consist of over one million pixels.
Silva F. M. A. * Nascimento-Dias B. L. Camargo B. C. B.	*Study of the Formation of Terrestrial Exoplanets in the Habitability Zone of Orange Dwarf Stars: Superhabitable Worlds* **[#7057]** The objective of this project is to carry out an analysis of planetary systems, which orbit orange dwarf stars by means of computational modeling, and to build a database with possible candidates for terrestrial exoplanets in the Habitability Zone.
Zeng X. G. * Zuo W. Gao X. Y. Liu Y. X. Li C. L.	*In-Situ Exploration Data Positioning of Chang'E-4 Rover with Transverse Route Mapping* **[#7009]** To support the data archive and post-data analysis of Chang'E-4 Rover, we tried to make an updating transverse map of CE-4 Rover, and a geo-location based database for the in-situ science data.

Monday, June 28, 2021
PROCESSING SESSION 1: PROCESSING CAPABILITIES AND PIPELINES
9:00 a.m. PDT/12:00 p.m. EDT/4:00 p.m. UTC
Divine stereo processing.
Chair: Fred Calef

*Authors (*Denotes Presenter)*	*Abstract Title and Summary*
Adoram-Kershner L. A. * Wheeler B. H. Laura J. R. Fergason R. L. Mayer D. P.	*Automated Kaguya TC and MRO CTX Stereo DEM Generation* **[#7021]** Description of the generation, validation, and publication of DEMs using USGS Integrated Software for Imagers and Spectrometers and NASA Ames Stereo Pipeline applied to Mars Reconnaissance Orbiter Context Camera and Kaguya Terrain Camera data.
Annex A. M. * Lewis K. W.	*ASAP-Stereo, Ames Stereo Automated Pipeline* **[#7003]** ASAP-Stereo (aka ASAP) is an open-source (BSD-3) high-level workflow wrapper for the NASA Ames Stereo Pipeline (ASP) written in Python. ASAP provides a framework and utility "glue" for implementing workflows using ASP.

Schorghofer N. *	*High-Throughput Processing of Diviner Data from the PDS* **[#7004]** The Diviner data set is used to study the throughput for various compression formats. Zstandard and Brotli produce files that are significantly smaller and faster to decompress than those used on the PDS. A throughput of 1 GB/s was achieved.
	BREAK

Monday, June 28, 2021
DATA PROCESSING: DATA OR SOFTWARE ARCHITECTURE, MANAGEMENT, AND INTEROPERABILITY
10:00 a.m. PDT/1:00 p.m. EDT/5:00 p.m. UTC
Enabling rover and human localization and beyond to extrasolar studies.
Chair: Tom Stein

*Authors (*Denotes Presenter)*	*Abstract Title and Summary*
Abarca H. * Calef F. III	*Mars Exploration Rover In-Situ Global Observation Localization Dataset (MERIGOLD)* **[#7101]** MERIGOLD, Mars Exploration Rover InSitu Global Observation Localization Dataset, is a newly funded PDART that will provide all Opportunity and Spirit Rover instrument data product locations in Mars global frame using a series of coordinate transforms.
Crichton D. J. * Lazio T. J. Hughes J. S. Jewell J. Law E. Padams J. Roudier G.	*On the Use of Planetary Science Data for Studying Extrasolar Planets: Enabling Cross-SMD Archive Interoperability* **[#7058]** NASA could enable new approaches to studying both extrasolar planets and bodies within the solar system by investing in analytical data services infrastructures, post-archive, that provides the ability to integrate data across NASA archives.
Miller M. J. * Feist B. Pittman C. W. Alexander A. Britton A. Jagge A. Montalvo J. Graff T. Abercromby A. Kanelakos A.	*Extravehicular Activity Mission System Software (EMSS) — Enabling Human Planetary Exploration Data Within the Broader Planetary Data Ecosystem* **[#7016]** This paper focuses on EVA Mission System Software (EMSS) project at NASA Johnson Space Center components and proposes how Artemis EVA mission data might integrate with the broader planetary data ecosystem.

Monday, June 28, 2021
BIRDS-OF-A-FEATHER: GEOSPATIAL PIPELINES
10:45 a.m. PDT/1:45 p.m. EDT/5:45 UTC
Birds-of-a-feather session outside normal meeting hours to discuss needed methods and tools to support geospatial and mission pipelines.
Moderator: Emily Law
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Tuesday, June 29, 2021
BIRDS-OF-A-FEATHER: A.I., SOLAR, AND LUNAR ECLIPSES
6:00 a.m. PDT/9:00 a.m. EDT/1:00 p.m. UTC
Birds-of-a-feather session outside normal meeting hours to discuss solar and lunar eclipses and the use of AI for related data sets.
Moderator: Padma Yanamandra-Fisher

Tuesday, June 29, 2021
PSA: DATA OR SOFTWARE ARCHITECTURE, MANAGEMENT, AND INTEROPERABILITY
7:00 a.m. PDT/10:00 a.m. EDT/2:00 p.m. UTC
Updates and methods for ESA's PSA.
Chair: Christophe Arviset

*Authors (*Denotes Presenter)*	*Abstract Title and Summary*
Hare T. * Stein T. *	*Announcements*
Besse S. * Barbarisi I. de Marchi G. Merin B. Arenas J. Bentley M. Docasal R. Coia D. Grotheer E. Heather D. Lim T. Martinez S. Montero A. Osinde J. Raga F. Ruano J. Saiz J.	*ESA's Planetary Science Archive Efforts to Support the Scientific Community* **[#7069]** With missions being selected, moving to post-operations, and missions starting their journey, the European Space Agency's Planetary Science Archive is in constant evolution to support the needs of the projects and of the scientific community.
Escalante A. * Vallés R. Arviset C.	*Updates on SPICE for ESA Planetary Missions* **[#7013]** The ESA SPICE Service (ESS) leads the SPICE operations for ESA missions. ESS generates the SPICE Kernel Datasets (SKDs) for missions in development, operations, and legacy. The current status and latest developments of the SKDs are presented.
Grotheer E. * Barbarisi I. Bentley M. Besse S. Breitfellner M. Cardesin-Moinelo A. Castillo M. Coia D. del Rio-Gaztelurrutia T. Docasal R. Grieger B. Heather D. Hernandez-Bernal J. Hueso R. Lim T. Manaud N. Marin-Yaseli J. Martin P. Merin B. Merritt D. Montero A. Osinde-Lopez J. Raga-Lopez F. Ravanis E. Saiz-Santos J. Sanchez-Lavega A. Titov D. Voelker M.	*Using the ESA's Planetary Science Archive to Search for Mars Express VMC Data of an Elongated Cloud Near Arsia Mons* **[#7040]** The ESA's Mars Express mission has been returning scientific data for 17+ years. The Visual Monitoring Camera observed an elongated cloud near Arsia Mons. In this presentation, we will show how to use the PSA user interface to find this data.
Ladegaard A. *	*Passthrough: Template-Driven PDS4 Product Generation* **[#7034]** The Passthrough software library seeks to provide PDS4 data processors with an integrated solution for generating output labels based on the concept of declarative product type templates.

Manaud N. * Besse S. Montero A. Escalante A. Valles R. Barbarisi I. de Marchi G. Merin B. Gaspéri J. PSA Team	*GEOGEN: A New Approach and Tool for Computing the Geometry Metadata of ESA's PSA Observational Data Products* **[#7067]** We present a new approach and tool for computing the geometry metadata of ESA's PSA observational data products, enabling PSA UI end-users with geometrical and geospatial search and visualisation capabilities.

Tuesday, June 29, 2021
KEYNOTE: PLANETARY DATA ECOSYSTEM INDEPENDENT REVIEW BOARD FINDINGS
8:00 a.m. PDT/11:00 a.m. EDT/3:00 p.m. UTC
Panel members share the stage to discuss the Planetary Data Ecosystem Independent Review Board findings.
Moderator: Trent Hare
Panel Members: Emily Lakdawalla and Becky McCauley Rench
Planetary Data Ecosystem findings from the report: https://science.nasa.gov/science-pink/s3fs-public/atoms/files/PDE%20IRB%20Final%20Report.pdf

Tuesday, June 29, 2021
DATA AND METHODS: ANALYSIS AND VISUALIZATION TOOLS, CURRENT OR NEW ALGORITHMS AND METHODS
9:00 a.m. PDT/12:00 p.m. EDT/4:00 p.m. UTC
Photometry, calibration, control, and footsteps.
Chair: Emily Martin

*Authors (*Denotes Presenter)*	*Abstract Title and Summary*
Gonzales N. R. * Schulte J. A. Robinson M. S.	*In the Footsteps of the First: Apollo 14 Spatiotemporal Map* **[#7062]** New maps of astronaut activities at the Apollo 14 landing site detail where each astronaut was and what they were doing, at any given time during the two periods of extravehicular activities — from samples to golf swings, we have located it all!
Macdonald K. * Lindsay R. Procter-Murphy R. Horchler A.	*Validation of Photometrically Corrected Lunar Images* **[#7091]** Precision landing requires terrain to be visualized at mission illumination conditions. We describe using photometric models and angles of local topography to generate photometrically corrected images, which can be ray traced to meet mission needs.
Robbins S. J. * Kirchoff M. R. Hoover R. H.	*Fully Controlling Mars Reconnaissance Orbiter Context Camera Images and Producing Cosmetically Stable Mosaics: Methods* **[#7086]** When big images / Require big solutions: / New thoughts required.
Wirth-Singh A. A. * Cahill J. T. S. Waller D.	*Fourier Transform De-Striping of LRO LAMP Data Products* **[#7065]** We describe and implement a Fourier transform method of de-striping images and apply it to LRO Lyman-Alpha Mapping Project data. This data exhibits periodic, unidirectional striping noise which is effectively removed by this method.
	BREAK

Tuesday, June 29, 2021
UPDATES: DATA OR SOFTWARE ARCHITECTURE, MANAGEMENT, AND INTEROPERABILITY
10:00 a.m. PDT/1:00 p.m. EDT/5:00 p.m. UTC
Data citations, what's new for SPICE, IAU, and planetary OGC services.
Chair: Tom Stein

*Authors (*Denotes Presenter)*	*Abstract Title and Summary*
Archinal B. A. * IAU WG on Cart. Crd. & Rot. Elements	*Coordination of Planetary Coordinate System Recommendations by the IAU Working Group on Cartographic Coordinates and Rotational Elements — An Update* **[#7051]** Status report from the IAU WG on Cartographic Coordinates and Rotational Elements, with recommendations on planetary coordinate systems and body shapes, a discussion of the future of such recommendations and the WG, and a request for community input.
Costa Sitja M. *	*What's Happening with SPICE at NAIF?* **[#7047]** Overview of the current NAIF activities. Status of the current SPICE toolkit, development of the SPICE2.0, recently released new versions WebGeocalc, Cosmographia, and on-going archiving of SPICE data in the PDS.
Coward C. M. * Agarwal D. A. Copas K. A.	*The Data Citation Community of Practice: An Introduction and Report* **[#7084]** The Data Citation Community of Practice is a global affiliation of planetary scientists, data scientists, publishers, and others who are working to address and solve the complexity of citing data sets in the professional literature.
Hare T. M. * Malapert J-C.	*Standards Proposal for 2021 to Support Planetary Coordinate Reference Systems for Open Geospatial Web Services* **[#7012]** This abstract outlines an updated proposal to encode planetary map projections for OGC web services. The update leverages the recent availability of the International Organization for Standardization (ISO) 19162 standard, also known as WKT2.
Padams J. * Raugh A. Crichton D. Law E. Hughes J. S. Joyner R.	*NASA Planetary Data System and Data Object Identifiers (DOIs)* **[#7059]** As the NASA Planetary Data System and the PDS4 architecture continue to evolve towards becoming a more FAIR system, the PDS now mints Data Object Identifiers (DOIs) for all PDS archival bundles, collections, and data sets.

Tuesday, June 29, 2021
BIRDS-OF-A-FEATHER: PDS4 AND PDE FINDINGS
10:45 a.m. PDT/1:45 p.m. EDT/5:45 p.m. UTC
Birds-of-a-feather session outside normal meeting hours to discuss the Planetary Data Ecosystem Independent Review Board findings and keynote topics.
Moderator: Sarah Black
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Wednesday, June 30, 2021
BIRDS-OF-A-FEATHER: REPRODUCIBLE SCIENTIFIC RESULTS
6:00 a.m. PDT/9:00 a.m. EDT/1:00 p.m.
Birds-of-a-feather session outside normal meeting hours to discuss the goal for supporting reproducible science results.
Moderator: Mario D'Amore

Wednesday, June 30, 2021
SCIENCE DATA: DATA OR SOFTWARE ARCHITECTURE, MANAGEMENT, AND INTEROPERABILITY
7:00 a.m. PDT/10:00 a.m. EDT/2:00 p.m. UTC
Data access, platforms, and resources.
Chair: Emily Martin

*Authors (*Denotes Presenter)*	*Abstract Title and Summary*
Hare T. * Stein T. *	*Announcements*
Arviset C. * Navarro V. Basso D. Alvarez R. Basso D. del Rio S. Diego M. A. Lopez-Caniego M. Lousa Marques A. Marinic F. Pereira A. Ramons N. Zlobin V.	*ESA DATALABS: Towards a Collaborative E-Science Platform for ESA* **[#7014]** ESA Datalabs opens a new world for e-science collaboration platform that will provide scientists and engineers with an open science environment to process, analyze, and visualise the sheer volume of science data.
Harrison T. N. * Mascaro J.	*Access to Planet High Spatial and Temporal Resolution Earth Observation Imagery via the NASA Commercial Smallsat Data Acquisition (CSDA) Program* **[#7107]** Through NASA's Commercial Smallsat Data Acquisition Program, all NASA-funded researchers can access Planet's PlanetScope (3–5 m) and RapidEye (6.5 m) imagery for scientific use, providing a rich dataset for analogue work for planetary scientists.
Nass A. * Muehlbauer M. d'Amore M. Heinen T. Boeck M. Munteanu R. Riedlinger T. Helbert J. Roatsch T. Strunz G.	*Multi-Mission Information System in Planetary Sciences: A Prototype for Planetary Research Data and Publications* **[#7071]** The goal is to enable different user groups to store and spatially explore research data centrally, sustainably across multiple missions and scientific disciplines in planetary science for future investigations.
Nass A. * Massironi M. Rossi A. P. Penasa L. Pozzobon R. Brandt C.	*Geologic MApping of Planetary Bodies (GMAP) — Current Status, Requirements, and Plans* **[#7089]** The aim of this contribution is to present the current status of the GMAP efforts, describe what are the requested requirements within the European Mapping community, and finally to introduce which advancing evolutions we are focused on.
Martinez S. * Bentley M. S. Cornet T. Cuevas M. A. Fajersztejn N. Freschi M. Galan D. Gallegos J. Macfarlane A. J. Moss R. Vallejo F.	*Science Data Processing, Quick-Look Analysis, and Archiving Approach for ESA's Planetary Missions* **[#7074]** This contribution describes how the data processing, quick-look analysis, and archiving approach for ESA's planetary missions is evolving towards an strategic concept aiming at getting science data with the highest-quality possible into the archive.

Wednesday, June 30, 2021
CLOUD: BIG DATA, CLOUD COMPUTING, AND SCALABLE COMPUTING
8:00 a.m. PDT/11:00 a.m. EDT/3:00 p.m. UTC
To the cloud from mission support to distributed pipelines.
Chair: Dan Crichton

*Authors (*Denotes Presenter)*	*Abstract Title and Summary*
Elliott J. P. * Meisner R. McClellan B. Jacobshagen E. Jain S. Schneider N.	*AWS Processing Pipeline for MAVEN IUVS* **[#7104]** We present a scalable cloud-based data processing pipeline developed for the MAVEN IUVS instrument.
Grimes K. M. II * Verma R. McAuley J. M. Soliman T. Natha A. Taylor Z. M.	*Cloud Processing of PDS Archival Products with Amazon Web Services, Kubernetes, and Elasticsearch* **[#7102]** PDS Imaging Node is reimagining the backend architecture supporting its flagship offering Image Atlas and other tools according to the microservices design model and leveraging the latest cloud-native technologies.
Ji P. * Lehnert K. Stern D. Figueroa J. D. Profeta L. Mays J. Johansson A. Song L.	*Migration to the Cloud: Lessons Learned from the Project "Development and Operation of the Astromaterials Data System"* **[#7039]** The Astromaterials Data System team has been working over the past year to migrate the on-premise infrastructure of the system to Amazon Web Services. This presentation will discuss the rationale for migration and describe the lessons learned.
Taylor Z. M. * Grimes K. M. Lunsford B.	*KDP: A Distributed Pipeline Processing Tool for Kubernetes* **[#7106]** We present a novel distributed pipeline processing tool for Kubernetes that PDS IMG has developed for large-scale data processing on its nearly petabyte-scale archive.
Verma R. * Grimes K. M. II Taylor Z. M. McAuley J. M. Le M. Alanis R.	*Experiments in Transferring, Validating, and Releasing Mars 2020 Mission Archival Multi-Media and Imagery Data Deliveries in the Cloud* **[#7097]** The PDS Imaging Node has a rich history of evolving mission data delivery mechanisms to keep pace with emerging technologies in industry. We explore and share experiments with accepting, validating, and releasing M2020 data deliveries in the cloud.
	BREAK

Wednesday, June 30, 2021
AI/ML: ARTIFICIAL INTELLIGENCE AND MACHINE LEARNING
9:00 a.m. PDT/12:00 p.m. EDT/4:00 p.m. UTC
New efforts in artificial intelligence and machine learning.
Chair: Trent Hare

*Authors (*Denotes Presenter)*	*Abstract Title and Summary*
Da Poian V. * Lyness E. I. Danell R. M. Li X. Trainer M. G. Brinckerhoff W. B.	*Towards Science Autonomy for Planetary Mission: Machine Learning Application for ExoMars Mission* **[#7010]** We present a first step toward this vision of science autonomy for space science missions presenting a machine learning approach for analyzing data from the Mars Organic Molecule Analyzer (MOMA) instrument on the ExoMars mission.
Karpoor P. R. * Bharadwaj P. Narendranath S. Pillai N. S.	*Deep Redatuming of Chandrayaan — 2 Large Area Soft X-Ray Spectrometer (CLASS) Data for Chemical Mapping of the Lunar Surface* **[#7077]** Present work is a novel implementation of model independent approach that is application of semi-supervised deep redatuming using SymAE Autoencoder towards an accurate inference of the chemical composition of lunar surface.

Klein N. * Gasda P. Castorena J. Oyen D. A.	*Gaussian Process Variational Autoencoders for Generative Modeling of ChemCam Data* **[#7052]** We demonstrate deep generative models on laser-induced breakdown spectroscopy data from ChemCam on the Curiosity rover. In this case, the models map chemical compositions to spectra, useful for uncertainty quantification and sensitivity analysis.
Raimalwala K. V. * Faragalli M. F. Battler M. M. Smal E. P. Cole M. Cross M. Reid J. E.	*Automated Characterization of Planetary Surface Geological Features from Surface Spacecraft Cameras to Support Mission Operations* **[#7079]** AI-based classification of surface geological features can enable autonomous decision-making for science instrument targeting, and can help support analysis and command cycles for Earth-based science teams.
Rodriguez L. E. * Yanchilina A. G. Lamm S. Simon K. H. Eshelman E. J. Sudlik C. Pochettino O. Kelley D. S. Price R. E. Sobron P. S. Barge L. M.	*Raman-LIBS Data Fusion for Ocean World Exploration* **[#7098]** Herein, we investigated the feasibility of using Raman and Laser Induced Breakdown Spectroscopy, alone or concatenated together (i.e., data fusion), as a means to facilitate the exploration of and search for life at hydrothermal vents on Ocean Worlds.
	BREAK

Wednesday, June 30, 2021
POSTER SESSION 2: ARTIFICIAL INTELLIGENCE, MACHINE LEARNING, CLOUD, AND OTHER
10:00 a.m./1:00 p.m. EDT/5:00 p.m. UTC
Moderator: Tom Stein

Authors (*Denotes Presenter)	*Abstract Title and Summary*
Arvidson L. A. * Politte D. V. Scholes D.	*Cloud Adoption Strategy for the Planetary Data System Geosciences Node* **[#7055]** This presentation will cover how the Planetary Data System Geosciences Node has migrated several IT functions to the cloud and how the node plans to further its cloud integration in areas that will add value to planetary archive data.
Castorena J. * Oyen D. Klein N. Ollila A. Legget C. Lanza N.	*Deep Learning for ChemCam Analysis* **[#7078]** This work summarizes a deep learning method operating on ChemCam's laser induced breakdown spectroscopy (LIBS) signals to learn to (1) pre-process to mitigate for sensor uncertainty, and (2) calibrate to extract chemical constituents of a sample.
Doran G. * Wronkiewicz M. Mauceri S.	*On-Board Downlink Prioritization Balancing Science Utility and Data Diversity* **[#7048]** On-board, content-based data prioritization that accounts for both science utility and diversity is an essential tool for missions with downlink constraints that acquire large volumes of data in search of rare but scientifically interesting features.
Drozdovskiy I. Sauro F. * Payler S. J. Hill S. Jahoda P. Jaruskova K. Venegas F. Angellotti A. Franke M. Lennert P. Ligeza G. Vodnik P. Turchi L. Bessone L.	*Recognising Planetary Rocks and Minerals by Combining a Custom Mineralogical Database with Deep Learning Based Multi-Spectral Unmixing* **[#7076]** The ESA-PANGAEA Mineralogical Toolkit is a set of data analytics tools aiming to enhance the recognition of planetary rocks and minerals. It includes the PANGAEA Mineralogical Database and a set of spectral classification methods using Machine Learning.
Gallegos N. * Malhotra S. Nainan C. Day B. H.	*Feature Detection and Line of Sight Analysis on the Moon Trek Portal* **[#7063]** The Trek Portals are adding two new capabilities to their suite of tools: A feature detector which leverages powerful deep learning models for detecting features on images, and DEMs with SPICE to find "lines of sight" between orbiters and surfaces.

Lawton P. J. * Bauer J. M. Padams J. H.	*AWS Glacier Use at PDS SBN* **[#7011]** The Planetary Data System (PDS) Small Bodies Node (SBN) has been involved in a pilot use of Amazon Web Services (AWS) Glacier as an offsite backup.
Lehnert K. * Mays J. Figueroa J. D. Ji P. Johansson A. Profeta L. Song L.	*Bringing Lab Analytical Data for Astromaterials to the Planetary Data Ecosystem* **[#7103]** The Astromaterials Data System (AstroMat) is a comprehensive solution to the management, archiving, and dissemination of laboratory data of astromaterials samples.
Marques M. M. * Nascimento-Dias B. L. Camargo B. C. B.	*Studying the Formation of Terrestrial Exoplanet in Habitable Zone Regions of Binary Systems* **[#7056]** This paper consists of an analysis of the data obtained for the Zone of Habitability of binary systems. Two systems of interest were analyzed by the program Habitable Zone in Multiple Star Systems and later compared with the Rebound software.
Neakrase L. D. V. * Pagán T. D. Arnold T. Huber L. Chanover N.	*ELSA Revealed: Philosophy and Purpose, Student-Led Design* **[#7082]** The PDS Atmospheres Node has been developing new online software, the Educational Labeling System for Atmospheres (ELSA), designed by undergraduate students and node personnel to help providers learn PDS4 and create bundle label templates.
Rodriguez K. * Lee K. D. Paquette A. C. Sanders A. R. Laura J. R.	*ISIS Test Data Reduction* **[#7064]** ISIS test data is a burden for both internal developers and external contributors as it consists of many large files totaling ~72 GBs. By using new testing suites and moving to representative input data, we have reduced this data by ~70%.
Turchi L. T. * Payler S. P. Sauro F. S. Pozzobon R. P. Massironi M. M. Bessone L. B.	*The Electronic Fieldbook: A Field Science Support System for Astronaut Training and Planetary Exploration* **[#7075]** The Electronic FieldBook EFB is a field deployable distributed system for supporting science operations during astronaut training. Key features are the P2P data merging and distribution, disruption tolerant mesh network, and easy to use user interface.

Wednesday, June 30, 2021
BIRDS-OF-A-FEATHER: CLOUD

11:00 a.m. PDT/2:00 p.m. EDT/6:00 p.m. UTC
Birds-of-a-feather session outside normal meeting hours to discuss needed methods and tools to support cloud-based services, distributed processing, and bid-data topics.
Moderator: Tom Stein
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Thursday, July 1, 2021
BIRDS-OF-A-FEATHER: GEOLOGIC MAPPING
6:00 a.m. PDT/9:00 a.m. EDT/1:00 p.m. UTC
Birds-of-a-feather session outside normal meeting hours to discuss current and needed geologic tools and the latest GMAP training session.
Moderator: Angelo Rossi

Thursday, July 1, 2021
PDS TOOLS: DATA ARCHIVING AND DISTRIBUTION SERVICES; HANDS-ON TRAINING AND HOW-TO GUIDES
7:00 a.m. PDT/10:00 a.m. EDT/2:00 p.m. UTC
State of the PDS4 model and tools.
Chair: Dan Crichton

*Authors (*Denotes Presenter)*	*Abstract Title and Summary*
Hare T. * Stein T. *	*Announcements*
French R. S. * Stopp D. J. Chang Y.-J. Tiscareno M. S. Showalter M. R. Gordon M. K.	*The Outer Planets Unified Search (OPUS) Tool — Current Status and Future Plans* **[#7008]** OPUS is a comprehensive search tool provided by the Ring-Moon Systems Node of NASA's Planetary Data System. We will present updates to the software and data archives made over the past two years along with future plans.
Soliman T. Natha A. Grimes K. * Verma R. Mcauley M.	*Searching the Stars with AtlasIV* **[#7099]** PDS Imaging Node is modernizing the archival search experience for end-users. We discuss the latest features of our flagship Atlas tool.
Hughes J. S. * Padams J. H. Joyner R. S. Bentley M. S. Lim T. Loubrieu T. G.	*The State of the PDS4 Information Model* **[#7017]** Since the 2019 report on the state of the PDS4 Information Model, several changes have significantly improved its efficiency and use. This presentation will present these improvements and how its original intent continues to be realized.
Wang J. * Scholes D. Arvidson R. E. Guinness E. A. Zhou F.	*Planetary Data Search with PDS Geosciences Node's Orbital Data Explorer* **[#7025]** An overview of NASA's Planetary Data System (PDS) Geosciences Node's Orbital Data Explorer (ODE), which provides web-based functions to search and access PDS3 and PDS4 archives of orbital data from multiple planetary missions and instruments.

Thursday, July 1, 2021
ANALYSIS AND PROCESSING: ANALYSIS AND VISUALIZATION TOOLS, CURRENT OR NEW ALGORITHMS AND METHODS

8:00 a.m. PDT/11:00 a.m. EDT/3:00 p.m. UTC
Functional data flows to enhance science returns for change detection and online viewsheds.
Chair: Trent Hare

*Authors (*Denotes Presenter)*	*Abstract Title and Summary*
Diniega S. * Jackson B. Soto A. Rafkin S. Doran G. Mandrake L. Swann C. Sullivan R. Banfield D. Fenton L. Ewing R. Burr D. Walker I. Barba N. Giersch L.	*Enhanced Science Return for Process Investigations from Environment-Responsive ConOps* **[#7092]** Surface or air moves… / How to see with small data? / Agile Science win.

Grieger B. *	*Functional Programming for Dummies: The Data Flow Perspective* **[#7015]** Functional programming is a powerful paradigm. However, the focus on functions obscures what is actually a data flow. We discussed tools that allow to directly describe the data flow and facilitate "functional programming without functions."
Rodriguez K. * Paquette A. C. Sanders A. R. Dundas C. M.	*Preliminary Results on Automated Change Detection in the Autocnet Environment* **[#7081]** We have developed new novel change detection tested against HiRISE images to programmatically detect spatiotemporal changes, particularly focused on martian gullies.
Soliman T. * Calef F. III	*Implementation of a Web-Based Viewshed Tool* **[#7095]** A tool built off of existing algorithms, adapted to the web, and spruced up has been deployed in the MMGIS mapping program to allow viewshed creation on any spherical planetary body with an accompanying DEM.
	BREAK

Thursday, July 1, 2021
KEYNOTE: REMOVING BARRIERS AND INCREASE INCLUSIVITY IN THE PLANETARY SCIENCE COMMUNITY
9:00 a.m. PDT/12:00 p.m. EDT/4:00 p.m. UTC
Keynote addressing barriers in the planetary community with the goal to increase inclusivity.
Moderator: Trent Hare
Panel Members: Kristen Bennett and Laszlo Kestay

*Authors (*Denotes Presenter)*	*Abstract Title and Summary*
Keszthelyi L. Milazzo M. Miller M. Lakdawalla E.	*Planetary Data: Hidden Barriers to Diversity in the Planetary Science Community* **[#7027]** We highlight the role that planetary data plays as an unacknowledged systemic barrier to entry into the planetary science community.

Thursday, July 1, 2021
PYTHONS AND APIS: DATA OR SOFTWARE ARCHITECTURE, MANAGEMENT, AND INTEROPERABILITY

10:00 a.m. PDT/1:00 p.m. EDT/5:00 p.m. UTC
Python-based tools, open-source software, and introduction to the new PDS API.
Chair: Ross Beyer

*Authors (*Denotes Presenter)*	*Abstract Title and Summary*
Aye K.-M. * Beyer R. A. Annex A. M. Million C.	*The PlanetaryPy Project* **[#7026]** The PlanetaryPy Project is a community effort to develop a core package for planetary science in Python and foster interoperability between Python planetary science packages.
Carr K. A. C. * Azubuike O. A. Tran A. T. Carreira C. C. Alfaro C. A. Greenhagen G. B. Patterson G. W. P. Stickle A. M. S. Prem P. P. Cahill J. T. S. C. Tai Udovicic C. J. T. U.	*Lunar Crater Maturity Analysis in Python: Developing a Toolkit for Ejecta Analysis* **[#7087]** We aim to develop an open-source toolkit that automates data analysis by combining datasets corresponding to different wavelengths of spectral imaging, whereby reducing manual intervention.
Mapel J. * Annex A. M. Aye K. M. Beyer R. A. Laura J. Silva V.	*The Planetary Software Organization and Open Source Software Governance* **[#7029]** An overview of the Planetary Software Organization and the importance of governance for open source software projects.

Michael G. G. *	*Planetary Surface Dating with Craterstats3 — A New Open Source Implementation in Python* **[#7045]** I present a fresh implementation of the Craterstats tool for analysing crater count data in the context of a planetary surface chronology model. The new software is written in Python and made open-source.
Padams J. * Loubrieu T. Crichton D. Hughes J. S. Law E.	*NASA Planetary Data System API* **[#7060]** The PDS4 architectural approach has evolved in the PDS Data Services Initiative with a vision to provide an integrated world-wide data services platform. Consistent APIs are a central pillar to enabling efficient access to all planetary science data.

Thursday, July 1, 2021
BIRDS-OF-A-FEATHER: PLANETARYPY — A COMMUNITY RESOURCE
10:45 a.m. PDT/1:45 p.m. EDT/5:45 p.m. UTC
Birds-of-a-feather session outside normal meeting hours to introduce and discuss PlanetaryPy as a community-wide resource for tools written generally in Python following the lead of AstroPy effort.
Moderator: Michael Aye
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Friday, July 2, 2021
BIRDS-OF-A-FEATHER: Stereo and Topography (ASP, Socet GXP, Topographic Data)
6:00 a.m. PDT/9:00 a.m. EDT/1:00 p.m. UTC
Birds-of-a-feather session outside normal meeting hours to discuss methods for the generation of topographic data including applications like NASA Stereo-pipeline, Socet GXP, etc.
Moderator: Trent Hare

Friday, July 2, 2021
ANALYSIS DATA: DATA OR SOFTWARE ARCHITECTURE, MANAGEMENT, AND INTEROPERABILITY
7:00 a.m. PDT/10:00 a.m. EDT/2:00 p.m. UTC
Analysis Ready Data (ARD) efforts across facilities and missions.
Chair: Christophe Arviset

*Authors (*Denotes Presenter)*	*Abstract Title and Summary*
Hare T. * Stein T. *	*Announcements*
Bristow T. F. * Lafuente B. Wolfe S. Parenteau N. Stone N. Rojo S. Boydstun K. Blake D. Downs R. Dateo C.	*A Strategy for Managing NASA's Long Tail of Planetary Research Data: Insights from the Development of the AHED Repository* **[#7093]** We detail the architecture of the Astrobiology and Habitable Environments Database system to guide strategies for data management in other NASA-funded scientific disciplines where research is performed by individual PIs, and small research teams.

Erard S. * Cecconi B. Le Sidaner P. Rossi A. P. Tomasik L. Ivanovski S. Schmitt B. André N. Trompet L. Scherf M. Hueso R. Demleitner M. Manaud N. Taylor M. Alexeev I. Määttänen A. Millour E. Schmidt F. Waldmann I. Fernique P. D'Amore M. Brandt C. Rothkaehl H. Molinaro M. Génot V. Vandaele A. C.	*Planetary Data in the Virtual Observatory: VESPA (Virtual European Solar and Planetary Access)* **[#7073]** In the past 10 years, VESPA has defined an architecture adapted from the astronomy VO, and incorporating concepts and standards from other areas. Progress and new ideas are presented here.
Fergason R. L. * Hunter M. A. Laura J. R. Hare T. M.	*Analysis Ready Data Available Through the SpatioTemporal Asset Catalog (STAC) Specification: Investigating the Application to Planetary Data* **[#7023]** We describe efforts to enable analysis-ready planetary data to be accessible via STAC. This service could allow individuals to discover and utilize data products and for existing services to consume data through a well-documented API.
Hare T. M. * Thomson B. J. Gaddis L. R. Stopar J. Archinal B. A. Laura J. R. MAPSIT Steering Committee	*Building a Lunar Spatial Data Infrastructure (SDI)* **[#7054]** Here we briefly introduce the five planetary spatial data infrastructure (PDSI) themes to aid in the development of a lunar SDI.
Williams D. A. * Nelson D. M. Milazzo M. P.	*The Io GIS Database, V. 1.0: A Proto-Io Planetary Spatial Data Infrastructure* **[#7002]** This presentation discusses a new higher-order data product for Jupiter's moon Io, built in ArcGIS and JMARS, composed of published Io data sets. It is intended to be the initial data component of an Io planetary spatial data infrastructure (PSDI).
Zinzi A. * Giardino M. Giunta A. Perozzi E. Di Cecco A. Polenta G.	*The NEO Physical Properties Database of the Neorocks EU Project* **[#7032]** Within the EU funded NEOROCKS project the ASI-SSDC, relying on its long-lasting experience on space-data dissemination, is defining a novel NEO Physical Properties database capable of hosting a great variety of NEO physical characterization data.

Friday, July 2, 2021
POSTER SESSION 3: DATA ARCHIVING AND DISTRIBUTION SERVICES; HANDS-ON TRAINING AND HOW-TO GUIDES
8:00 a.m. PDT/11:00 a.m. EDT/3:00 p.m. UTC
Moderator: Trent Hare

Authors (*Denotes Presenter)	*Abstract Title and Summary*
Bailey A. M. * Mehall L. K. Cisneros E. Bell J. F. III Paris K. N. Jenson E. H. Maki J. N. Mastcam-Z Science and Operations Team	*The NASA Mars 2020 Mission Perseverance Rover Mastcam-Z Data Archive* **[#7038]** The Mastcam-Z camera system is onboard the Mars 2020 Perseverance rover currently acquiring data products on Mars. These data products will be archived in the Planetary Data System starting August 2021.
Baker D. M. H. * Rumpf M. E. Keszthelyi L. P. Richardson J. A. Whelley P. L. Schmerr N. M. Young K. E.	*Towards a Terrestrial Analogs Data Portal: Use Cases and Requirements* **[#7046]** We present progress towards establishing a Terrestrial Analogs Data Portal, including identifying use cases from field analog research teams and data management requirements.

Besse S. * Coward C. Lakdawalla E. Milazzo M. Wilson B. McGrath M. PDE-IRB Team	*Report of the Planetary Data Ecosystem Independent Review Board* **[#7070]** The Planetary Data Ecosystem (PDE) Independent Review Board (IRB) was chartered by NASA in the fall of 2020 to conduct a wholistic review of the Ecosystem. Five months of effort has culminated in 67 Findings and 65 Recommendations presented below.
Coia D. * Lim T. Bentley M. Barbarisi I. Besse S. Docasal R. Giordano F. Grieger B. Grotheer E. Heather D. Merin B. Osinde J. Saiz J.	*Advanced Search in the PSA for ExoMars TGO Data Discovery* **[#7043]** This poster describes some advanced search capabilities for ESA's Planetary Science Archive with particular emphasis on the ExoMars 2016 mission.
Geissler P. E. *	*Migrating the Cassini RADAR Archive to PDS4* **[#7036]** This abstract describes the steps taken to migrate the Cassini RADAR archive to PDS4 compliance while preserving the PDS3 archive intact so that it can continue to be used as it has been in the past.
Guinness E. A. * Politte D. V. Slavney S.	*Migration of Magellan Mission from the PDS3 to the PDS4 Standard* **[#7030]** The PDS Geosciences Node is migrating its collection of Magellan Venus datasets from the PDS3 to PDS4 standard. The archive of Magellan data consists of twelve datasets and comprises a data volume of about 750 Gbytes with over 700,000 files.
Heather D. J. * Taylor M. G. G. Besse S. Barbarisi I. Montero A. Docasal R. Grieger B.	*The Rosetta Science Archive: Preparing for Legacy Science* **[#7072]** We present the activities that have been completed in the last few years to prepare the Rosetta mission science data for legacy archiving, and the corresponding updates to functionality that have been needed for this in the archive itself.
Huber L. F. * Güth T. Emmett J. Chanover N. Neakrase L. D. V.	*Atmospheres Data: Galileo, Mariner, Juno Migration* **[#7083]** The PDS Atmospheres Node is continuing the process of migrating its archived data holdings from the PDS3 to PDS4 archiving standard. Here we discuss our recent migration work that encompasses the Juno, Galileo, and Mariner missions.
Wagstaff K. L. * Le M. N. McAuley J. M.	*Designing a Machine Learning Local Data Dictionary* **[#7085]** This abstract/poster centers on a Machine Learning Local Data Dictionary created by the Cartography and Imaging Sciences Node to facilitate and promote archival practices in the machine learning domain.
Lim T.-L. * Docasal R. Sefton-Nash E. Salvioli F. Coia D. Bentley M. Besse S. Grieger B. Grotheer E. Heather D. Martin P. Osinde J. Ruano J.	*An Update on the ExoMars 2022 Rover Data Archive* **[#7066]** This presentation will provide an update on the development of the ExoMars 2022 Rover mission archive. The status and plans for the Rover Traverse view development will be discussed along with the data design choices for the mission.
Slavney S. * Ward J. G. Arvidson L. E. Arvidson R. A.	*PDS Geosciences Node Data and Services* **[#7035]** The PDS Geosciences Node archives planetary data from NASA missions and data analysis programs, and provides tools and expert advice to data preparers and end users

Friday, July 2, 2021
SPECTRAL: ANALYSIS AND VISUALIZATION TOOLS, CURRENT OR NEW ALGORITHMS AND METHODS
9:00 a.m. PDT/12:00 p.m. EDT/4:00 p.m. UTC
Spectral and mineralogy databases and an introduction to a new PDS spectral library.
Chair: Tom Stein

*Authors (*Denotes Presenter)*	*Abstract Title and Summary*
Blake D. F. * Bristow T. F. Lafuente B. Downs R. T. Downs G. Sarrazin P. Stone N.	*The CheMin Database: A Collaborative Tool for Mineralogy and Planetary Science* **[#7080]** An interactive website of Mars mineralogical data from the CheMin XRD Instrument is described. Cloud-based algorithms allow the scientific community at large to reanalyze raw data obtained from the instrument on Mars.
Manigand S. * Turenne N. Sidhu S. Connell S. Potin S. M. Applin D. Cloutis E. A.	*Development of a Raman Spectral Database for Lunar Science: A Little SALSA on Your Data* **[#7031]** We present the development of a new Raman spectral database of lunar-relevant samples: The Spectral Analyses of Lunar Soils and Analogues database (SALSA database) that will support future lunar missions by storing and sharing data with the community.
Scholes D. * Guinness A. Slavney S. Arvidson R. E.	*Introduction to the PDS Geosciences Node Spectral Library Website* **[#7006]** The PDS Geosciences Node Spectral Library website (https://pds-speclib.rsl.wustl.edu) is a new web-based interface that provides search, review, and download options for spectral data that has been archived by the PDS.
	BREAK

Friday, July 2, 2021
PROCESSING SESSION 2: ANALYSIS AND VISUALIZATION TOOLS, CURRENT OR NEW ALGORITHMS AND METHODS

10:00 a.m. PDT/1:00 p.m. EDT/5:00 p.m. UTC
Novel processing methods and science validation.
Chair: Trent Hare
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*Authors (*Denotes Presenter)*	*Abstract Title and Summary*
Bentley M. S. * Cornet T. Macfarlane A. J. Martinez S. Moss R.	*Science Validation in an Operational Archive — Experience from BepiColombo* **[#7068]** PDS4 missions in the PSA deliver archive products on a regular basis. This enables rapid visualisation and use of archive data, but comes with challenges when checking completeness and scientific validation. Experience from BepiColombo is discussed.
Dutton N. T. * Mendlovitz M. A. Turner F. S. Patterson G. W.	*A Novel Heuristic Algorithm for Finding Sparse, Thin Curved Lines in Imagery with Structured Noise* **[#7024]** A new algorithm for finding curved lines in imagery with other similarly shaped noise sources. Example application with bi-static radar waterfall plots from LRO/Mini-RF.
Turner J. E. * O'Shea C. M. Turner F. S. Patterson G. W. Klima R. L.	*A 2-Dimensional Approach to Rendering On- and Off-Body Shapes Around an Ellipsoidal Body* **[#7088]** A 2-dimensional solution to interactively visualizing planetary data that is not conducive for visualizing on a map-projection of a body.
Zinzi A. * Camplone V. Rognini E. Giardino M. Nodjoumi G. Orosei R. Rossi A. P. Massironi M. Grassi D. Mura A.	*MATISSE 2.0: The SSDC Webtool for Integrated Planetary Science Analysis* **[#7018]** MATISSE is the SSDC scientific webtool dedicated to planetary sciences. The first version was released in early 2013 and 2.0 version has been available to the public for about a year. This is written in Python with 2D/3D data visualization.

Print Only

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*Authors (*Denotes Presenter)*	*Abstract Title and Summary*
Beyer R.	*Python Parameter Value Language (PVL) Library* **[#7037]** PVL/ODL is a markup language commonly used for planetary science data archived under version three of the Planetary Data System (PDS). This Python package allows decoding of PVL-text to Python objects, and encoding of Python objects to PVL-text.
Hunter M. Rumpf M. E.	*AstroLink Roadmap for the Preservation, Digitization, and Service of Historically Significant Materials* **[#7050]** An update of AstroLink's ongoing work to digitize and serve historically significant materials, and migrate archive inventories to a web based platform.