

# VESPA updates, May 2023

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# New in VESPA

**Clean up of data services/registry**

**VESPA portal updates**

**New data services**

**New functionalities**

**New developments**

**Prospects**

# Clean up of data services/registry

**EPN-TAP:** Rec since Aug 2022 — <https://ivoa.net/documents/EPNTAP/>

=> update/fix existing services (> 60) + DaCHS update where possible

=> fixed service registration process

=> clean up registry

Relies on taplint validation & EPN-TAP mixin in DaCHS

PADC validator now supports EPN-TAP, based on taplint (*R. Savalle in Ops*)  
very helpful to track non-compliances

=> will continue in the coming months

most services stored on a gitlab, greatly helps maintenance

# Europlanet VESPA: Data services connected via EPN-TAP / field

Open  
Open in test | upgrade required  
Drafted  
Scheduled 2024 (selection)  
• New or upgraded in 2021/22  
• New content in 2021/22

## Atmospheres

- Titan profiles - CIRS (Cassini, LESIA)
- Venus spectroscopy - VIRTIS (VEx, LESIA)
- Mars & Venus Climate Databases (modeling, LMD)
  - GEM\_Mars (modeling, IASB-BIRA)
- Venus profiles - SPICAV/SOIR (VEx, IASB-BIRA)
- Mars profiles - SPICAM (MEx, LATMOS)
  - All MEx derived atmospheric products (via MEx IDS)
  - Venus cloud products (LATMOS)
- TGO/NOMAD (BIRA-IASB)

## Small bodies

- M4ast (ground based spectroscopy, IMCCE)
- 1P/Halley spectroscopy (IKS / Vega-1, LESIA)
- BaseCom (Nançay Obs, LESIA)
  - TNOs are cool (Herchel & Spitzer + compilation, LESIA & LAM & Utinam)
- SBNAF (from H2020 prog, Konkoly Obs)
- MP3C: Small body properties (OCA)
  - Vesta & Ceres spectroscopy - VIR/DAWN (IAPS)
- DynAstVO: NEO refined parameters (IMCCE)
- MPCorb: Small bodies orbital cat (MPC/Heidelberg)
  - Rosetta ground-based support (Edinburgh)
  - 67P illumination config (IRAP)
  - Meteor\_showers predictions (IMCCE)
  - Occultations predictions, ast & sat (IMCCE)
  - LuckyStar, occultations (ERC prog, LESIA)
  - Natural satellites db (IMCCE)
- asteroid spectra (CDS / LESIA)

## Solid spectroscopy

- SSHADE ices & minerals spectro (IPAG & network)
  - Planetary Spectral Library (DLR)
  - PDS spectral library (LESIA)
  - Berlin Reflectance Spectral Lib (DLR)
  - Hoserlab (Winnipeg U)

## Surfaces

- Mars craters (Jacobs U, + update by GEOPS)
  - USGS planetary maps WMS (Jacobs U)
- PlanMap: geol maps (H2020 prog, Jacobs U)
  - CRISM WCS service (MRO, Jacobs U)
  - M3 WMS service (Chandrayaan-1, Jacobs U)
  - HRSC nadir images, WMS (MEx, Frei Univ)
  - OMEGA cubes and maps (MEx, IAS)
- VIMS satellites, w/geometry (Cassini, LPG)
- Mars topo preTharsis (GEOPS)
  - Global spectral param of Mercury (DLR)

## Magnetospheres / radio

- APIS (HST/Cassini, LESIA)
- NDA (Jupiter & Sun radio, LESIA/CDN)
- AMDA (CDPP / IRAP)
- MASER & related services (LESIA)
- RadioJove (PDS PPI: US amateur network)
- Datasets from PDS / PPI (UCLA)
  - Iitate HF data of Jupiter (Tohoku Univ, Jap)
  - UTR-2 Juno ground support (Kharkiv)
  - MDISC & JASMIN (modeling, UCL)
  - Cluster & Themis data (IAP, Prague)
  - IMPEX models (from FP7 prog, IWF Graz)
- Hisaki (Tohoku Univ., Jap)
  - Transplanet (CDPP / IRAP)
- LOFAR Jupiter (CBK/PAS, Warsaw)
  - Magnetic field simus (LMSU)
  - ASPERA & MARSIS atm obs (MEx, Iowa U)

## Solar

- HELIO AR & 1T3 solar features (FP7 prog, LESIA)
- Bass2000 (LESIA)
  - Radio Solar db (Nançay, LESIA)
- CLIMSO (Pic du Midi, IRAP)
- IPRT/AMATERAS (Tohoku Univ, Jap)
  - Gaia-DEM (SDO, IAS)
  - EIT\_syn (SoHO, IAS)
  - e-Callisto (Windisch, Sw)

## Generic / interdisciplinary

- BDIP (LESIA)
- PVOL (UPV/EHU & amateur network)
  - Telescopic planetary spectra collection (LESIA)
- PSA complete archive (ESA)
- HST planetary data (LESIA, to CADC archive)
  - Catalogues of planetary maps (Budapest)
- VizieR\_planets: Planetary Science catalogues (CDS)
  - Gas absorption cross-sections (Granada)
  - Planets then satellites properties (LESIA/IMCCE)
  - Nasa dust catalogue (IAPS)
  - Stellar spectra, support for observations (LESIA)
  - DARTS (JAXA - currently via PDAP)
  - ESA sky planetary data (ESA)
  - Interface with VAMDC ?

## Exoplanets

- Encyclopedia of exoplanets (LUTH/LESIA)
  - Catalogue of exo disks (LESIA)
  - Interface with DACE (Geneva)
  - ARTECS climate simulations (AOTS/INAF)
  - Atmospheric studies (UCL)
- Exotopo: exoplanet surface simulations (GEOPS)

# VESPA portal updates

**VESPA portal:** dedicated client <https://vespa.obspm.fr>

Layout updated Sept 2022, from UX analysis

More layout updates to come

## **New functions required:**

- to support large increase in service number (*S. Joy, this session*)  
=> thematic grouping?
- to provide an alternative search interface in "natural language"  
Requires downloading all metadata (~  $10^9$  values)  
Currently used to check / validate service content (private access)

# New EPN-TAP services

And major updates

- **NASA PPI** projects (many!) - (*S. Joy, this session*)
- **MASER** and **Heliophysics** services - (*B. Cecconi in RadiolG*)
- **VizieR\_planets** service (descriptions completed, PADC + CDS)
- Several **small bodies** services
  - including spectro\_asteroids (now the largest collection after Gaia DR3)
  - See also *A. Zinzi / M. Giardino, this session*
- Several **exoplanets** services being setup by various groups
  - with focus on planetary science (disks, atmospheres, climate...)

# New functionalities in EPN-TAP services

**Datalink:** routinely used to provide docs, alternative formats, associated files, links to other data services, ephemeris (with row parameters)

## **MOC:**

- Preferred to s\_region (issues with large coverages typically acquired during flybys or orbital insertions, and some configurations)
- Extension to ST-MOC foreseen - e.g., to describe operation phases of space experiments

# New developments

**2D searches** in ElasticSearch context (*R. Haigron, starting*)

**Planetary coordinate reference systems** (CRS, IAU definitions)

In astropy (*C. Marmo, just started* - first: body-fixed for solid bodies)

=> to be included in IVOA reframe vocabulary (under *body*)

Ties with OGC consortium (mostly to handle planetary CRS, with compliant IDs) - (*T. Hare / J. C. Malapert, this session*)

**New Planetary HiPS** (CDS) - (*T. Boch, this session*)

**HiPS to WMS** converter (provided by CNES)

**New support functions in TOPCAT, Aladin, CASSIS**

**Facility list** and resolver (broader than Solar System)

=> to be included in IVOA vocabulary

# Prospects

- closer links with PDS4 (*S. Hugues in DM*)
- more data services - VESPA implementation workshop end of may
- more tutorials, e.g. as Jupyter notebooks  
<https://github.com/ept-vespa/tutorials>
- DOIs on data collections (started for MASER services)
- [SpaceSci-RI proposal in Horizon Europe](#), initiated by Europlanet mngt  
Follow-up to ESCAPE (and Euro-VO progs), Europlanet progs, CheTEC-  
infra, etc  
Large VA WP encompassing VO, VESPA + SPIDER + GMAP +  
SSHAE, VAMDC, existing astro db, ML activities  
Answer expected during summer