VESPA: Virtual European Solar & Planetary Access

**Coordination:**
stephane.erard@obspm.fr
batiste.cecconi@obspm.fr

VA: an.rossi@jacobs-university.de
JRA: hrot@cbk.waw.pl
tomasik@cbk.waw.pl

**VESPA portal**
http://vespa.obspm.fr

**web site (outreach)**
http://www.europlanet-vespa.eu

**wiki (org.)**
https://voparis-wiki.obspm.fr/

**github (tuto, codes...)**
https://github.com/epn-vespa

**publication list**
https://voparis-wiki.obspm.fr/display/VES/Publications
VESPA includes 19 contributing participants (labs) in 14 institutes:

- Observatoire de Paris (IMCCE, LESIA, PADC)
- CBK-PAN Warsaw
- Jacobs Univ. Bremen
- CNRS (CDS IPSL IPAG IRAP)
- IWF Graz
- IASB-BIRA Brussels
- SpaceFrog Toulouse
- OATS/INAF Trieste
- DLR Berlin
- UPV/EHU Bilbao
- Univ. Bristol
- UCL London
- SINP-MSU Moscow
- Univ. Heidelberg

+ Contributions from the community
VESPA

- Open access data services:
  55 currently open in all fields of planetary science / heliophysics / exoplanets
  **New**: SBNAF from H2020 prog + upgrades/updates of some existing services

- Data handling tools from the Virtual Observatory
  **New** versions of TOPCAT and Aladin released, updated graphics
  Connection with planetary GIS upgraded
  OPUS code-on-line platform + assessment by ESA / JUICE (Callisto flyby)

- Global query system adapted from the Virtual Observatory
  **New**: EPN-TAP doc to be submitted to IVOA (very soon)

- Dissemination
  - Engage with international consortia and agencies (**IPDA, RDA, DACE, IHDEA, CNES**…)
  - **New**: Europlanet Soc now a member of IPDA steering committee + VESPA in DACE
  - Workshops to help science teams setting up their own data distribution system
  - EPSC 2020 demonstrates that EPNCare is adopted by the community (MITM9 session)
VESPA: Data services connected via EPN-TAP / field

### Atmospheres
- Titan profiles - CIRS (Cassini, LESIA)
- Venus spectroscopy - VIRTIS (VEx, LESIA)
- Mars Climate Database (modeling, LMD)
- Venus profiles - SPICAV/ SOIR (VEx, IASB-BIRA)
- Mars profiles - SPICAM (MEx, LATMOS)
- All MEx derived atmospheric products (via MEx IDS)
- Venus cloud products (LATMOS)
- ExoMars/NOMAD (BIRA-IASB)

### Small bodies
- M4ast (ground based spectroscopy, IMCCE)
- 1P/Halley spectroscopy - (IKS / Vega-1, LESIA)
- BaseCom - (Nançay Obs, LESIA)
- TNOs are cool - (Herschel & Spitzer + compilation, LESIA & LAM & Utinam)
- SBNAF - (from H2020 prog, Konkoly Obs)
- Cometary lines catalogue (IAPS)
- Vesta & Ceres spectroscopy - VIR/DAWN (IAPS)
- Rosetta ground-based support
- 67P illumination config (IRAP)
- Meteor_showers predictions (IMCCE)
- Occultations predictions, ast & sat (IMCCE)
- LuckyStar, occultations (ERC prog, LESIA)
- Natural satellites db (IMCCE)

### 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
- CRISM WCS service (MRO, Jacobs U)
- Mars craters (Jacobs U, + update by GEOPS)
- USGS planetary maps WMS (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)
- MarsSI GIS (Lyon)
- Global spectral param of Mercury (DLR)

### Magnetospheres / radio
- APIS (HST/Cassini, LESIA)
- NDA (Jupiter radio Nançay, LESIA)
- AMDA (CDPP / IRAP)
- MAG data (VEx, IWF Graz)
- MASER & related services (LESIA)
- RadioJove (LESIA & US amateur network)
- Ilstate 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 (from FP7 prog, LESIA)
- Bass2000 (LESIA)
- Radio Solar db (Nançay, LESIA)
- CLIMSO (Pic du Midi, IRAP)
- Ilstate AMATERAS (Tohoku Univ, Jap)
- Gaia-DEM (SDO, IAS)
- e-Callisto (Windisch, Sw)

### Generic / interdisciplinary
- BDIP (LESIA)
- Planets then satellites characteristics (LESIA/IMCCE)
- PVOL (UPV/EHU & amateur network)
- Gas absorption cross-sections (Granada)
- Nasa dust catalogue (IPAS)
- Stellar spectra, support for observations & expl. (LESIA)
- Telescopical planetary spectra collection (LESIA)
- Interface with VAMDC (TBD)
- PSA complete archive (ESA)
- HST planetary data (LESIA, to CADC archive)
- Catalogues of planetary maps (Budapest)
- VizieR catalogues in Planetary Science (CDS)
- DARTS (JAXA - currently via PDAP)
- Herschel planetary data (ESA)

### Exoplanets
- Encyclopedia of exoplanets (compilation, LUTH/LESIA)
- Catalogue of exo disks (LESIA)
- Interface with DACE (Geneva)
- ARTECS climate simulations (AOTS/INAF)
- Atmospheric studies (UCL)
- surface simulations (GEOPS)
VESPA: infrastructure

- EPN-TAP
- SAMP
- registry (IVOA)
- data services
- OPUS
- on-line codes
- VESPA-cloud
- version control
- EOSC
- authentication
- deployment
- 3 VESPA hubs

Tools: VO, GIS...

Commands: Jupyter notebooks, workflows...
VESPA: prospects

• Services:
  Implementation workshop scheduled in Toulouse April 2020 — postponed at last minute
  => need to find a replacement solution (on-line, early December?)
  Same with next workshop scheduled April 2021 in Bremen

• Tools:
  - VESPA portal update (from user inputs - another difficulty)
  - OPUS code-on-line platform (from ESCAPE H2020 pgr) - refine, port to EOSC

• Dissemination:
  - EPN-TAP doc nearly finalized => submitted to IVOA
  - More collaborations: ESA/PSA and astro, NASA/PDS, national and H2020 programmes
    => evolution towards VO solutions

• Internal interactions
  - Coordinate with TAs and NA2 to distribute their data (+ GMAP, SPIDER, ML)
  - Thematic collaborations within VESPA (exoplanets, atmospheres, surfaces, small bodies…)

• Adjustements
  - Delays in deliv & MS, rescheduled up to month 24
VESPA: prospects, 2

VESPA-cloud: common action with GÉANT/eduTEAMS, EGI/ESOC-hub…

- **What happens at the end of Early Adopter Programme?**
  - **Services** VESPA team will continue maintenance of deployed services, and deploy additional ones, within the allocated resources.
  - **Support** EOSC-Hub/EGI/EUDAT support to VESPA-Cloud may be extended in next EOSC programme (if we wish)
  - **Open issue:** what happens after that (in ~ 4 years from now)?

- **Current call to join the EOSC Association**
  - Either as a member or observer - with significant fees
  - **As a legal entity, the Europlanet Society is eligible**
    Observer status seems OK (~ 2 k€/yr; no vote)
    May be important to join the RI roadmap