# JRA4 ML - Machine Learning Solutions for Data Analysis and Exploitation in Planetary Science

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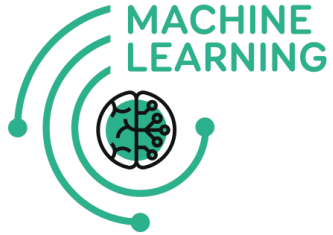
- Machine Learning (ML) powered data analysis and exploitation tools optimized for planetary science
- Integrate expert knowledge on ML into the planetary community

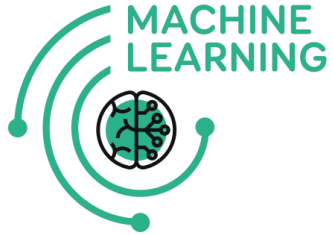
- Main objectives
  - to develop ML tools, designed for and tested on planetary science cases submitted by the community
  - to provide sustainable, open access to the resulting products, together with support documentation
  - to foster wider use of ML technologies in data driven space research
  - to demonstrate ML capabilities and generate a wider discussion on further possible applications of ML

# Science Cases




- Started work on three science cases
  - Detection of bow shock and magnetopause crossings in MESSENGER magnetometer data (Collaboration with LMSU, Moscow)
    - Presentation of first results at EPSC
  - Detection of mound like objects in LiDAR data from Mars (Collaboration with GMAP)
  - Detection and classification of ICMEs in in situ solar wind data (Collaboration with IWF, Graz)
    - Presentation of first results at ESWS (2 - 6 Nov)
- Tools developed for these cases used for next science cases

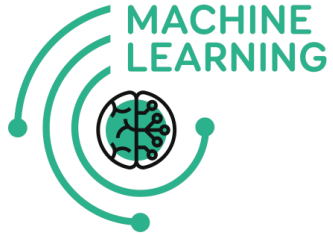
# ML Portal




- Access point for Europlanet ML activity
  - General information about ML activity, science cases, etc.
  - ML tutorials, tools, documentation
  - Jupyter notebooks, Python codes
  - List of publications

- Will be online by the end of October 2020: ml-portal.oeaw.ac.at

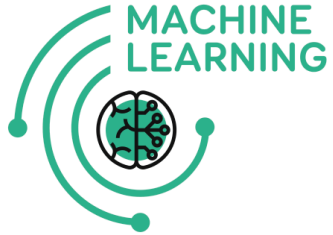
# Dissemination/Outreach Activities




- Conferences
  - Presentations at EPSC and ESWS
  - Session proposal for next year's EGU

  "Machine Learning in Planetary Sciences and Heliophysics"
- ML Portal
- Open-source codes on gitlab/github repositories
- VESPA
- EOSC
- Talks about ML activity
  - Open Planetary Lunch
  - Public outreach events

# COVID-19 Issues




- Know Center on reduced working hours from May until July 2020
- Most of us were/are in home office

- Virtual kick-off meeting instead of face-to-face
- Workshops for next year most probable also virtual

# Proposed Amendments

- Prolongation of WP for further 6 months (36 -> 42 months)

- Shift final deliverables (D4-D6, D8) to month 42

**D10.4** — *Demonstrator and Documentation of Data-Processing Techniques*

**D10.5** — *Demonstrator and Documentation of Time-based Signal Analysis and Automatic Classification Tool*

**D10.6** — *Demonstrator and Documentation of General Classification Toolset*

**D10.8** — *Tutorial on Machine Learning and Basic How To's (final release)*