

Leopold Desage

Early career researcher in planetary sciences

Born on 11/29/1997

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Education

- **PhD. In Astrophysics** (2020 - 2024) | Grenoble Alpes University
“Radar observation of Mars and Phobos with SHARAD/MRO and MARSIS/MEX: shallow subsurface echoes detection and orbital characterization.”
 - Analysis of SHARAD data in the southern midlatitudes of Mars to characterize the first tens of meters of the subsurface.
 - Clutter simulation using high-resolution digital elevation models (DEMs).
 - Comparison of the impact of different DEMs on the detection of subsurface reflectors.
 - Developed radar data analysis tools
 - Analysis of MARSIS data on Phobos with SAR synthesis of the data and comparison with simulation.
 - Orbital characterization of Phobos using MARSIS data.
- **Master’s degree in Astrophysics** (2019 - 2020) | Grenoble Alpes University
 - Study of various domains of Astrophysics (Planetology, radiative transfer, magnetohydrodynamics, observation techniques, exoplanets, galaxies, interstellar medium).
 - Title of the master’s thesis : *“Icy formations at Mars’ midlatitudes : analysis and interpretation”*
 - Analysis of SHARAD data at Mars’ midlatitudes with simulations using DEMs.
 - Getting familiar with SHARAD data, its SAR synthesis and different sources of DEM.
- **Master 1 in Physics, fundamental research studies** (2018 - 2019) | Grenoble Alpes University
 - General Physics studies, including quantum mechanics, solid-state physics, general relativity, solar science, introduction to astrophysics.
 - Title of the internship : *“Irradiation of interstellar ice analogs”*
 - Lab experiments using a Fourier-transform infrared spectrometer
 - Data analysis of irradiation of methanol and CO ice
- **Bachelor’s degree in Physics** (2017-2018) | **Grenoble Alpes University**
 - Title of the internship : *“Radar sounding of Phobos’ subsurface”*
 - MARSIS data analysis on Phobos
 - Simulation of MARSIS data using a shape model.

Employment

- **Postdoctoral researcher** (2024-present) | UTIG, University of Texas at Austin
 - Clutter discrimination for REASON on Europa (radar simulations)
 - Airborne polar radar data analysis

Publications

- **L. Desage**, A. Herique, V. Lainey, W. Kofman, A. Cicchetti, and R. Orosei '*MARSIS Data as a New Constraint for Phobos' Orbit*', accepted in *Astronomy & Astrophysics*, 2024.
- **L. Desage**, A. Herique, S. Douté, S. Zine, and W. Kofman, '*Resolving Ambiguities in SHARAD Data Analysis Using High-Resolution Digital Terrain Models*', *Remote Sensing*, vol. 15, no. 3, p. 764, Jan. 2023, doi.org/10.3390/rs15030764.
- Quirico, E., Bacmann, A., Wolters, C., Augé, B., Flandinet, L., Launois, T., Cooper, J.F., Vuitton, V., Gautier, T., Jovanovic, L., Boduch, P., Rothard, H., **Desage, L.**, Faure, A., Schmitt, B., Poch, O., Grundy, W.M., Protopapa, S., Fornasier, S., Cruikshank, D.P., Stern, S.A., 2023. On a radiolytic origin of red organics at the surface of the Arrokoth Trans-Neptunian Object. *Icarus* 394, 115396. doi.org/10.1016/j.icarus.2022.115396.

Posters

- **L.Desage**, A. Herique, V. Lainey, W. Kofman, A. Cicchetti, and R. Orosei '*MARSIS data as a new constraint for Phobos' orbit*', EPSC/DPS joint meeting 2023, San Antonio, TX.
- **L.Desage**, A. Herique, W. Kofman '*Martian Near Subsurface characterization with SHARAD using High Resolution Surface Models*', AGU Fall Meeting 2021, New Orleans, LA.
- **L.Desage**, A. Herique, W. Kofman '*The first tens of meters of the Martian midlatitude subsurface : How to analyze SHARAD signal?*' EPSC 2021, online.

Oral presentations

- **L.Desage**, A. Herique, V. Lainey, W. Kofman, A. Cicchetti, and R. Orosei '*Phobos observation using MARSIS data*', Mars Express SWT, Juin 2023.
- **L. Desage**, A. Herique, S. Douté, S. Zine, and W. Kofman '*Resolving Ambiguities in SHARAD Data Analysis Using High-Resolution Digital Terrain Models*', RIME science team, Mars 2023, Trento, IT.
- **L. Desage**, A. Herique, S. Douté, S. Zine, and W. Kofman '*Resolving Ambiguities in SHARAD Data Analysis using High Resolution Digital Terrain Models*', AGU Fall meeting 2022, Chicago, IL.
- **L. Desage**, A. Herique, S. Douté, S. Zine, and W. Kofman '*SHARAD Data analysis with High Resolution Terrain Models*', EPSC 2022, Granada, ES.

Teaching experience

- **Undergraduate teaching** (2022 and 2023)
 - Classical mechanics
- **Private lessons**(2017-2020)
 - Maths and Physics (high school students)

Technical skills

- **Languages**
 - French : mother tongue
 - English : C1 (toeic 955)
 - Italian : intermediate
 - Spanish : beginner
- **Programming languages**
 - IDL
 - Matlab
 - Python
- **Image editing software**
 - Photoshop
 - Pixelmator