

Press Release

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ExoMars 2020 Oxia Planum selected as landing site

Oxia Planum will be the landing site for the ExoMars 2020 mission—the second mission in the ExoMars programme, led by ESA in cooperation with Roscosmos. The site was recommended by an international consortium headed by the LGL-TPE Earth, planets and environment geology laboratory in Lyon (Claude Bernard Lyon 1 University/Ecole Normale Supérieure de Lyon/CNRS) in close partnership with the IAS space astrophysics institute (CNRS/Paris-Sud University). Oxia Planum was studied primarily using data collected by the OMEGA instrument, which was developed by IAS, the LESIA space and astrophysics instrumentation research laboratory and CNES and is operating on Europe's Mars Express orbiter. The ExoMars 2020 mission will be launched in July 2020 and will land on the Red Planet in March 2021.

Oxia Planum—the clear winner

European scientists and engineers met at the UK's National Space Centre in Leicester on 8 and 9 November to select the landing site for the ExoMars 2020 mission. The final two candidates—Mawrth Vallis and Oxia Planum—were recommended by two international teams, each led by a French laboratory. While both sites fulfil the mission's science goals of sampling ancient clay-bearing sediments, Oxia Planum offers greater safety margins for the crucial landing phase and for the rover's mobility. Nevertheless, Mawrth Vallis remains an exceptional site to be explored in the future. OMEGA has detected vast expanses of hydrated clay at both sites, and combining these data with those collected by US orbiters made it possible to characterize the sites in detail. The teams were able to process massive quantities of Martian orbital data using IAS's Planetary Surface Portal (<http://psup.ias.u-psud.fr/>).

Ancient Martian sediments

Oxia Planum is located on the edge of an ancient basin called Chryse Planitia and features thick sedimentary clay deposits that date back more than four billion years. Similar clay deposits have been detected at many other—equally ancient—sites on the planet, pointing to a formation process caused by the action of water at planetary scale. The structure and composition of these deposits mean they could be lagoon or marine deposits, testifying perhaps to the existence of an ancient Martian ocean according to results presented by the site's proposing team (Quantin, Carter et al. 2018). The science goal of ExoMars 2020 is to detect potential traces of life in samples extracted from up to two metres below the surface, using a drill-hole system. This will ensure that the Martian samples collected have been protected from cosmic bombardment, which destroys organic matter.

ExoMars 2020 will carry an observation and analysis laboratory

Scheduled to land on Mars in Spring 2021, the ExoMars 2020 mission will feature a Russian surface platform with Russian and European instruments, to acquire environmental measurements over an entire Martian year (687 Earth days). Its European rover will be equipped with nine science instruments dedicated to surface study and analysis. CNES and the French laboratories are in charge of two of the rover's instruments—WISDOM and MicrOmega. France is also involved in the development of three further instruments—RLS, CLUPI and MOMA:

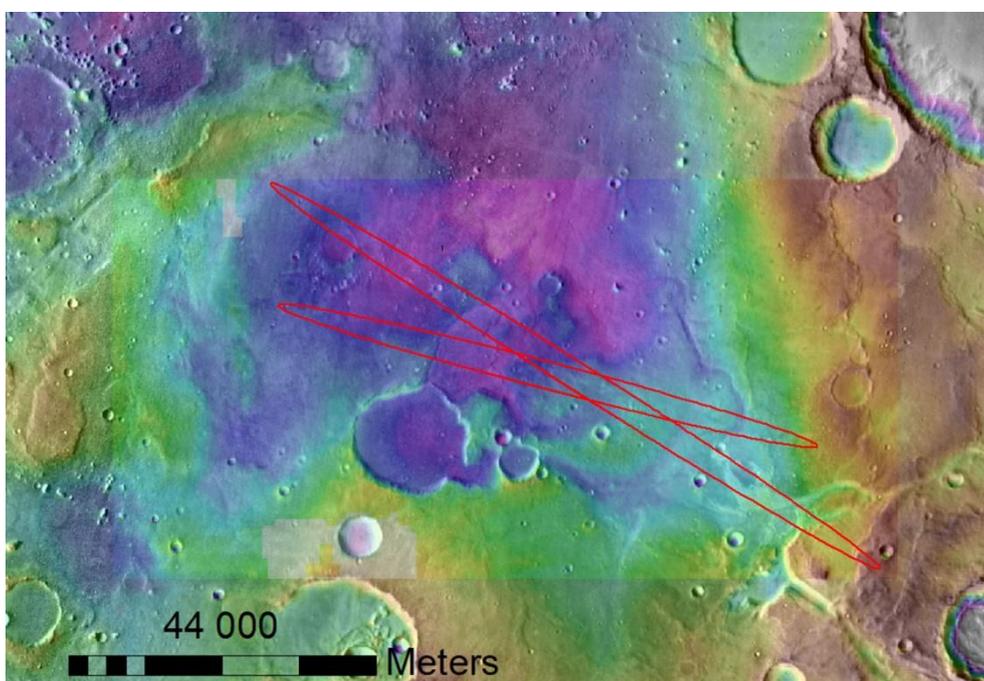
- **WISDOM** is a ground-penetrating radar that will provide images of the top few metres of the subsurface and thereby guide the type and location of the drill hole

- **MicrOmega** is a near-infrared hyperspectral microscope that will characterize minerals at grain level and identify any potential carbon elements in the drilled samples
- **RLS** (in cooperation with Spain) is a Raman spectrometer to fine-tune the identification of minerals and organic matter
- **CLUPI** (in cooperation with Switzerland) is a Close-UP Imager for observing rocky outcrops, the drill hole and the samples obtained
- **MOMA** (in cooperation with Germany and the USA) is a chemical analysis laboratory that uses a gas chromatograph-mass spectrometer to characterize organic matter

CNES has also provided software for the visual navigation of the ExoMars 2020 rover.

The four other instruments on the rover are:

- **PanCam** (developed by the UK) is a panoramic camera
- **ISEM** (developed by Russia) is an infrared spectrometer
- **Adron** (developed by Russia) is a neutron detector
- **Ma_MISS** (developed by Italy) is an infrared spectrometer installed in the drill head in order to study the subsurface.



MOLA topographic map showing landing ellipses at the start and end of the launch window

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