



PhD in Planetary Sciences

- Participation to the ESA ExoMars TGO Mars exploration mission
- Location: Space Research Centre, Polish Academy of Sciences, Wrocław
- EURAXESS job: <https://euraxess.ec.europa.eu/jobs/254063>
- PART-TIME (20h/week)

Field: geological sciences (geologic mapping, hydrothermal activity, mineral chemistry, volcanism, tectonics) or atmospheric sciences (atmosphere circulation modelling)

Description

For more than a decade, methane has been detected in the atmosphere of Mars by various instruments and groups. The ESA and IKI ExoMars Trace Gas Orbiter (TGO), launched in March 2016, will investigate the presence of methane and other trace gas sources in the Martian atmosphere starting from May 2018. Methane does not stay longer than days or months in the Martian atmosphere, which implies that if methane is detected, its source must be active. It can be either biological (methanogenic archaea) or geological (serpentinisation of olivine in the Martian crust, hydrothermal activity, outgassing from clathrates or minerals). On Earth, both types are frequently associated. The EXOMHYDR project focuses on the potential geologic sources, especially in volcanic regions and some fractured regions above which some strong emissions have been detected in the past. Current emissions will be identified using the NOMAD and ACS spectrometers of TGO, which will probe the atmosphere in a wide range of wavelengths, and will be correlated with possible sources identified using the colour and stereo CaSSIS camera of TGO and other instruments from previous missions (HiRISE, CRISM, HRSC, MOLA, SHARAD etc.). Ancient sources may be identified as well by interpreting the data from CaSSIS and earlier instruments. In addition to a better understanding of the structure of the Martian crust, we expect that this work will also contribute to the debate as to the current existence of microscopic life on Mars preserved from the lethal atmospheric ultraviolet radiations, and to the possibility of much more ancient biological activity. Hydrothermal sites are also sites where mineral/metal resources concentrate on Earth, shedding light into interesting sites for future space mining activities.

The project will be carried out by a group of young motivated researchers within the framework of European Space Agency's Guest Investigator Programme, and funded by the Operational Programme Smart Growth



2014-2020 of the European Union through the TEAM programme of the Foundation for Polish Science. It will be carried out in constant interaction with the TGO science teams, especially from ACS, CaSSIS and NOMAD.

For this PhD position, the successful applicant will be in charge of realising one of the project objectives, which include identification and mapping ancient methane outgassing sites, tracking trace gas emissions measured by NOMAD and ACS to potential geological sources, characterising the geology and physical properties of these sources, and evaluation of zeolites as potential sources and sinks of atmospheric methane. She/He will be committed to publish scientific results in international peer-reviewed journals and participate to science popularisation activities.

Skills/Qualifications

The successful applicant will have a demonstrable good knowledge and skills in either geologic mapping, magmatic (volcanic/intrusive) and tectonic processes, qualitative and quantitative geomorphology, remote sensing, and geographic information systems; or mineralogy, crystallography, petrology of igneous or mantle rocks; or atmosphere circulation/global climate modelling.

She/He will show motivation and enthusiasm for scientific activity in a multidisciplinary team, being a self-motivated and goal-oriented researcher, and will show ability at meeting deadlines, especially those dictated by TGO science team timelines and publication constraints.

Benefits

- Opportunity to work with science teams in a planetary exploration mission
- Work in a spirit of mutual benefit approach through multidisciplinary work
- Friendly working and living environments in Wrocław, European Capital of Culture 2016
- Attractive salary with respect to Polish standards, and including health insurance as well as retirement pension contribution valued in any EU member state.

Eligibility criteria

The applicant must hold a Master's degree in the fields Geology / Geophysics / Physics. The application shall include:

1. Copy of the Master's thesis and diploma
2. Copy of the grade sheets for the Master's and Bachelor's degrees
3. CV
4. Cover letter showing the motivation of the applicant and explaining her/his scientific interests, skills and strengths, and why s.he should be taken instead of another candidate. The letter should include the statement: "I hereby give consent for my personal data included in my application to be processed for the purposes of the recruitment process under the Personal Data Protection Act as of 29 August 1997, consolidated text: Journal of Laws 2016, item 922 as amended."
5. E-mail addresses of two scientists who can provide recommendation letters.

Selection process

Applications sent before the deadline will be considered.

Applications from candidates having an inadequate profile may be discarded. These candidates will be informed by email soon after submission. However, profiles which are not listed above may be considered if some benefit for the project is demonstrated.

The applicants will be asked to participate in talks held in Wrocław (favoured; Wrocław is a well-served low-cost airline destination) or via teleconference call. An oral or written examination in limited time aiming at



determining the scientific level of the candidates or their ability to deal with a given scientific problem may also be part of the selection procedure. The language used throughout the selection procedure will be English.

All the applicants will be informed about the results of the recruitment procedure by e-mail.

Additional information

Remuneration: 8 000 PLN of full remuneration cost, i.e. expected net salary 4 000 PLN

Important dates:

- Application deadline: December 10, 2017
- Notification of application selection for audition: December 11, 2017
- Audition: currently scheduled January 8 – 9, 2018
- Position starting date: March 1, 2018

Contact

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