

# UT Austin Portugal | 2019 Strategic Research Projects

## SPACE-EARTH INTERACTIONS

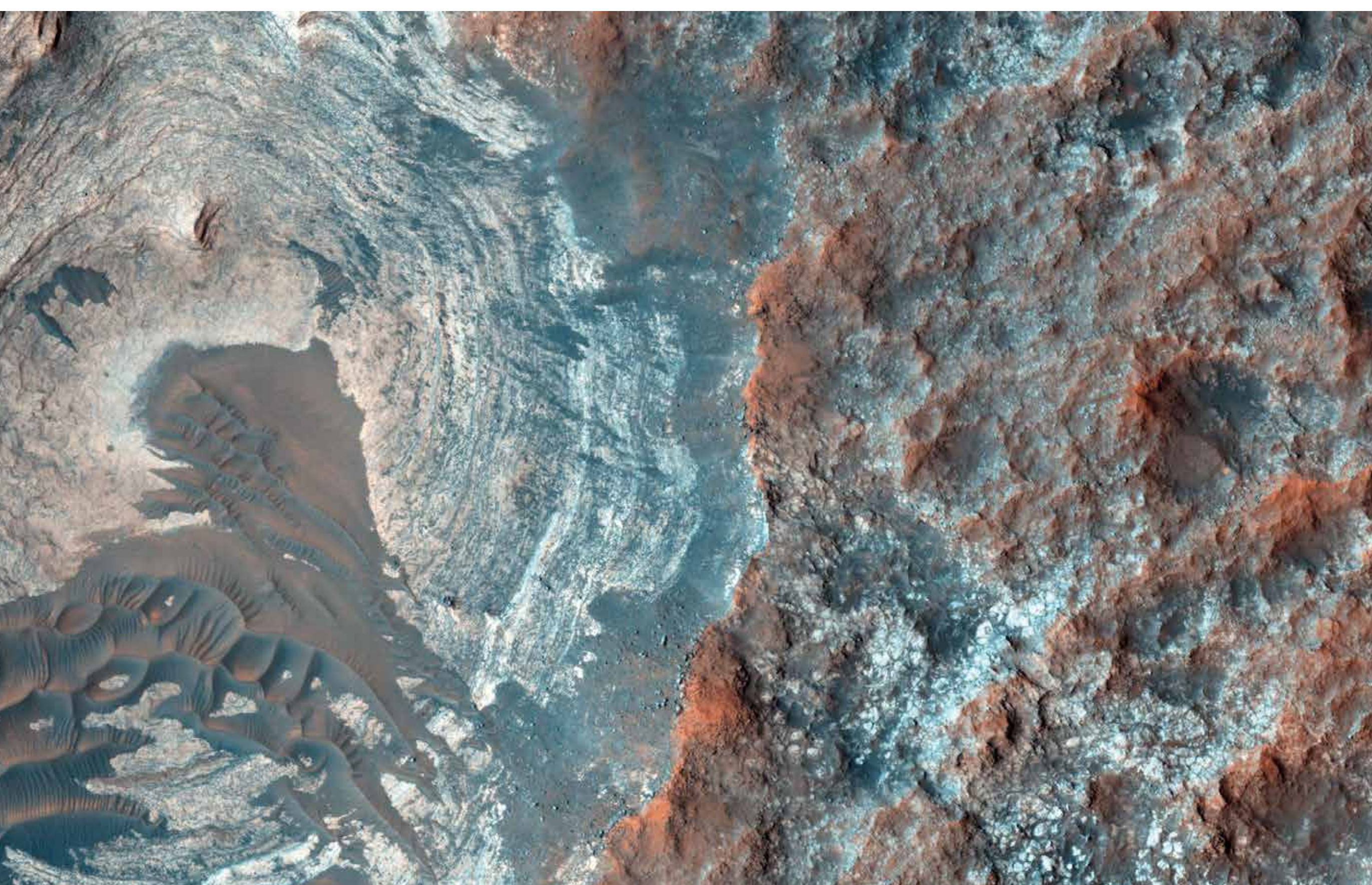
Start Date: 01-Jul-2020    Duration: 36 months    Operation Code: 45916

# MAGAL Constellation

Setting the cornerstone of a future ocean and climate change monitoring constellation, based on radar altimeter data combined with gravity and ocean temperature and salinity measurements

Climate change is one of the critical issues of our time. Following global warming, climate and ocean variations have, undeniably, intensified over time. MAGAL Constellation will develop the next generation of radar altimeter instruments to be adapted for a future constellation of small satellites.

Keywords: Climate change monitoring, Earth dataset, ocean, global warming



### Main challenge/problem the project seeks to address

The project seeks to understand long-term variability in local, regional, and global climate induced by ocean steric (temperature and salinity) variations. Concurrent monitoring of land water storage (soil moisture, snow, surface water, and groundwater) needs to go hand-in-hand with the oceanic measurements. Innovative data assimilation techniques need to be developed with the state-of-the-art ocean and land modelling to provide a consistent and systematic Earth dataset.

### Proposed solution

This project aims to develop the next generation of radar altimeter instruments and a series of small satellites to accommodate them. The project also includes a data processing and visualization system using advanced modelling, estimation techniques, statistical and scientific machine learning methods and error analysis.

### Innovative Potential

Efacec has been developing an innovative radar altimeter technology since 2010, through two ESA contracts, and this is the most relevant experience from which the project was created. In addition, through the Consortium's extensive experience in multi-satellite and multi-variate data assimilation, MAGAL also includes an innovative data and information processing and visualization system, using advanced high-performance modelling, estimation techniques, statistical and scientific machine learning methods, and error analysis in data gathered from different sources.

### Target beneficiaries

The Ocean has been assuming a more prominent role both as a mobiliser of technological, scientific, economic and social development, as well as a resource that must be protected and valued. One of the best ways to prospect, monitor and value the open ocean, in an economical and sustainable manner, is by leveraging on the Space/Earth interactions, in line with the "Atlantic Interactions" research agenda and, at a global scale, the UN Sustainable Development Goals.

### Consortium

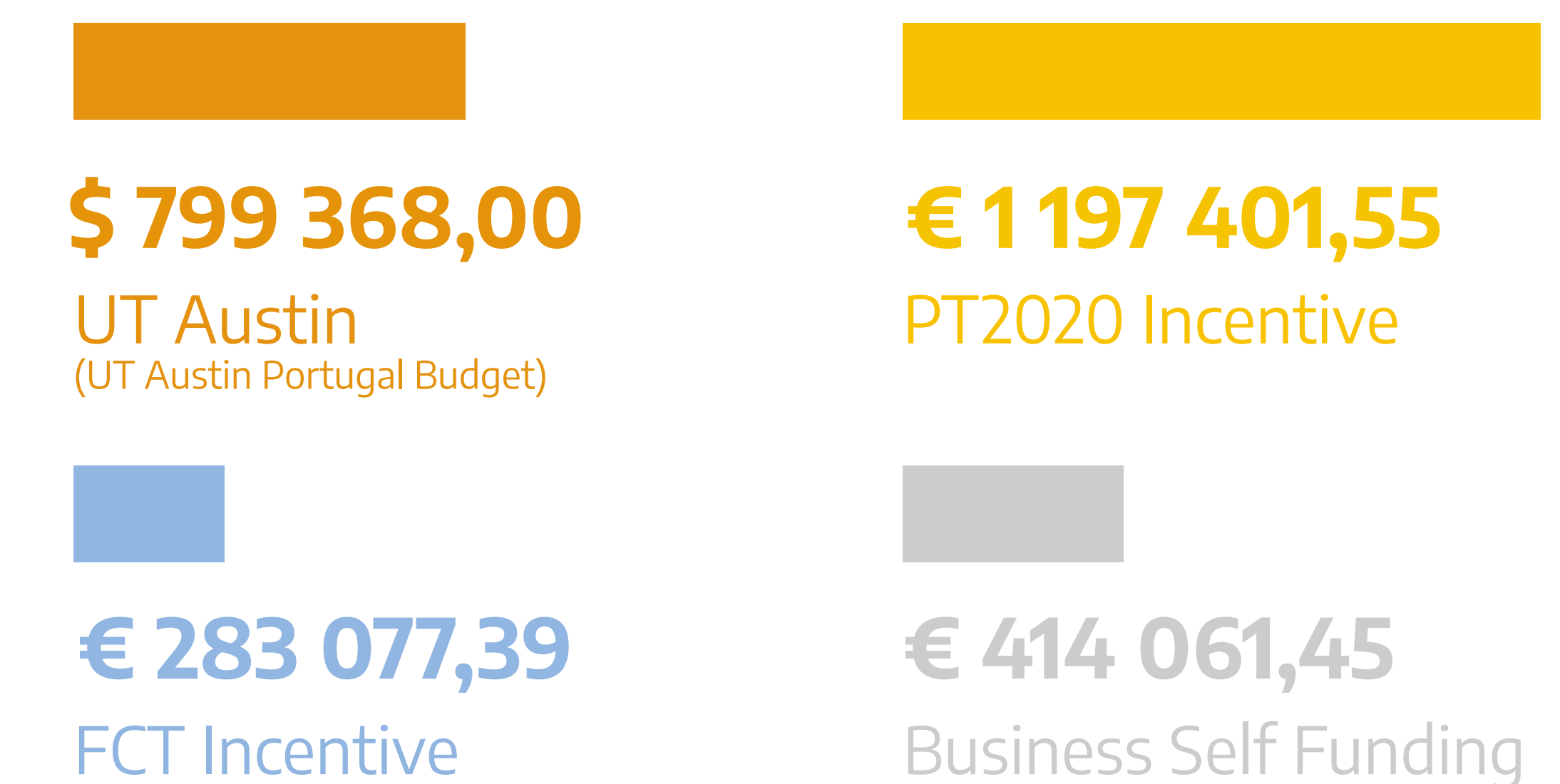
#### PORTUGAL

Efacec Energia – Máquinas e Equipamentos Eléctricos, S.A. (Lead Beneficiary)  
CEiiA – Centro de Engenharia e Desenvolvimento (Associação) Omnidea Lda.  
CIIMAR – Interdisciplinary Centre of Marine and Environment Research  
Instituto Superior Técnico  
Instituto de Telecomunicações  
University of Beira Interior  
+ATLANTIC, Associação para um Laboratório Colaborativo do Atlântico

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### Funding Sources Distribution



Co-funded by: