

Student Graduation Project Proposal Format*

Colleges: COS, CHSS

Semester/Academic year: Spring/Fall 2020

Industrial sponsor (if any): NSSTC UAEU

Project Title: Mars volcanoes and lava tubes/caves

Basics The planet Mars has a number of massive shield volcanoes. These include Olympus Mons (more than 20 km high), the highest mountain in the solar system, followed by the Tharsis volcanoes (14-18 km high), and Elysium Mons (ca. 14 km high). An analogue is given by the Hawaiian shield volcanoes on Earth.

An accompanying feature of shield volcanoes are lava tubes/caves. The latter are, in turn, of particular interest for the search of hypothetic ancient microbial life on Mars. That is because lava/tubes caves act as a natural protection against biologically harmful radiation. The skylights of Mars lava tubes/caves are identifiable from satellite imagery based on shadow and temperature effects. A Mars Global Cave Candidate catalogue is publicly available (https://astrogeology.usgs.gov/search/map/Mars/MarsCaveCatalog/mars_cave_catalog.zip)

Work idea

- 1.) Perform comparisons between Martian volcanoes and Hawaiian shield volcanoes on Earth.
- 2.) Discuss the identification and study of potential lava tube/cave skylights from satellite imagery/data. Verify it in do-it-yourself approach using the JMARS geospatial information system (GIS).

Source:

https://astropedia.astrogeology.usgs.gov/download/Mars/MarsCaveCatalog/thumbnails/ESP_046738_2090_1024_TroughEnd_candidate.png

