



Joint Press Release

Pescara (Italy), 27 August 2021

Some of the mysteries of Venus will be resolved by studying its geologically youngest areas

Future space probes to Venus should focus on the youngest volcanic features on the planet. This is the conclusion of an international team of planetary scientists, who wanted to determine if Venus is an active planet and the implications of this to understand Venus' geologic history. The study was published on <https://rdcu.be/cv7kT> in the scientific journal Solar System Research.

The geologic history of Venus is a mystery, and one of the most important unresolved questions is if Venus is currently an active planet like the Earth. Some scientists have long thought that most of the surface of the planet shouldn't be any younger than 500 million years. However, recent studies have shown that some areas there are much younger than that. Studying them more closely will help understanding what really happened on Venus. By extension, this will provide fundamental clues to the geologic evolution of our own planet, and to the outstanding question why the two planets are so drastically different.

The lead author of the study, Piero D'Incecco elaborates: "The topographic rises of Venus may cover a key role in our understanding of the whole geologic history of Venus."

"Moreover, there are a lot of open questions about how and how fast climate change affects our planet. Studying the chemistry of the surface-atmosphere interactions over young areas on Venus will provide crucial information about the mechanisms which caused the so-called runaway greenhouse effect on the hellish twin sister of our planet. We want to know if Venus can be considered as an Earth 2.0."

The study comes at a crucial time. Many new space probes - landers, balloons, and orbiters – will be sent to study Venus within the next ten years. Together, they will study everything from Venus' surface geology to the structure of its atmosphere. The first mission to launch is ISRO's Shukrayaan-1 in 2026 followed by Venera-D by Roscosmos, NASA's VERITAS and DAVINCI+ missions and EnVision by ESA.

Venus is Earth's hellish twin. The two planets are similar in size and structure, but on Venus the surface conditions are unbearable. The pressure is the same as under nearly a kilometer of water (93 bar), and the temperature is enough to melt lead (470 °C). The surface can be seen only using radar instruments. For any regular cameras, the view is obscured by a thick layer of sulfuric acid clouds.

The research team includes engineers and scientists involved with various near-future Venus missions: Piero D'Incecco (Università d'Annunzio, Chieti-Pescara, Italy / Arctic Planetary Science Institute, Rovaniemi, Finland), Justin Filiberto (Lunar and Planetary Institute, Houston, TX, USA; co-investigator of the DAVINCI+ mission), Iván López (Universidad Rey Juan Carlos, Madrid, Spain), Dmitry Gorinov (Space Research Institute of the Russian Academy of Sciences, Moscow,

Russia; science team member of the Venera-D mission), Goro Komatsu (Università d'Annunzio, Chieti-Pescara, Italy / International Research School of Planetary Sciences, Pescara, Italy; Science Study Team member of the EnVision mission), and Alexey Martynov and Pavel Pisarenko (Lavochkin Association, Khimki, Russia; system engineers of the Venera-D mission).

The study is titled “The young volcanic rises on Venus: a key scientific target for future orbital and in-situ measurements on Venus” and can be found at <https://rdcu.be/cv7kT>.

Additional information:

Dr. Piero D’Incecco

Università d’Annunzio, Chieti-Pescara, Italy

Mobile: +39 3894629883 (availability: Mon to Fri, 08-18 CET)

Email: piero.dincecco@unich.it