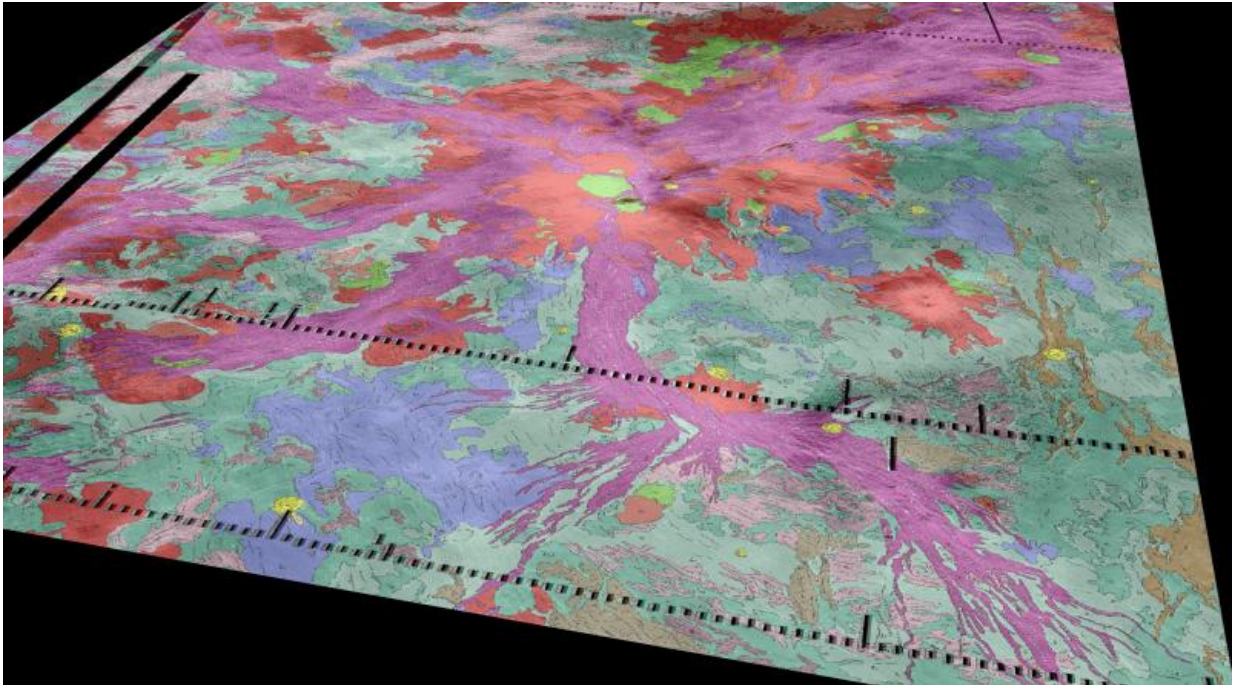


Study suggests active volcanism on Venus

June 18 2015, by Kevin Stacey



This perspective view of the geology of Venus superposed on topography shows a broad topographic rise (Atla Regio) in the center (red, with radiating purple spokes) and surrounding volcanic plains (green and blue).

The large Venus volcano Oza Mons (red, center) is several hundreds of miles across. Radiating from this rise are numerous tectonic rift zones (mapped in purple), regions of stretched and faulted crust of Venus. Although geologically relatively recent in the 4.5 billion year history of Venus, these terrains could be many hundreds of million years old and no longer active.

New images and measurements from the European Space Agency Venus Express Camera, however, show evidence that parts of the rift zones are the locations of active volcanism, providing compelling evidence that Venus in general, and the

rift zones in particular, continue to be sites of volcanic and tectonic activity well into the modern era.

In this image, color data was obtained from the global geological map of Venus (Ivanov & Head, 2011), texture data was acquired from Magellan Synthetic Aperture Radar (SAR) Left-Look FMAP (full resolution radar map) global mosaic, both draped over Magellan Global Topography data.

Ivanov, M. A., and J. W. Head III (2011), Global geological map of Venus, *Planet. Space Sci.*, 59, 1559-1600, doi: 10.1016/j.pss.2011.07.008. Credit: Ivanov/Head/Dickson/Brown University

An international team of scientists has found some of the best evidence yet that Venus, Earth's nearest neighbor, is volcanically active.

In combing through data from the European Space Agency's Venus Express mission, the scientists found transient spikes in temperature at several spots on the planet's surface. The hotspots, which were found to flash and fade over the course of just a few days, appear to be generated by active flows of lava on the surface.

"We were able to show strong evidence that Venus is volcanically, and thus internally, active today," said James W. Head, a geologist at Brown University and co-author of a paper describing the new research. "This is a major finding that helps us understand the evolution of planets like our own."

The research is published online in *Geophysical Research Letters*.

The hotspots turned up in thermal imaging taken by the Venus Express spacecraft's Venus Monitoring Camera. The data showed spikes in temperature of several hundred degrees Fahrenheit in spots ranging in size from 1 square kilometer to over 200 kilometers.

The spots were clustered in a large rift zone called Ganiki Chasma. Rift zones are formed by stretching of the crust by internal forces and hot magma that rises

toward the surface. Head and Russian colleague Mikhail Ivanov had previously mapped the region as part of a global geologic map of Venus generated from the Soviet Venera missions in the 1980s and U.S. Magellan mission in the 1990s. The mapping work had shown that Ganiki Chasma was quite young, geologically speaking, but just how young wasn't clear until now.

"We knew that Ganiki Chasma was the result of volcanism that had occurred fairly recently in geological terms, but we didn't know if it formed yesterday or was a billion years old," Head said. "The active anomalies detected by Venus Express fall exactly where we had mapped these relatively young deposits and suggest ongoing activity."

The latest finding is consistent with other data from Venus Express that have hinted at very recent volcanic activity. In 2010, infrared imaging from several volcanoes seemed to indicate lava flows from thousands to a few million years old. A few years later, scientists reported transient spikes in sulfur dioxide in Venus' upper atmosphere, another potential signal of active volcanism.

The observation of hotspots by Venus Express, combined with the geologic mapping from Venera and Magellan, make a strong case for a volcanically active Venus, Head says.

"This discovery fits nicely with the emerging picture of very recent activity in Venus' geologic history," he said. "These remarkable findings were the result of collaborations spanning many years and many political borders. They underscore the importance of international collaboration in exploring our solar system and understanding how it evolves."

More information: "Active Volcanism on Venus in the Ganiki Chasma Rift Zone," E. V. Shalygin, *Geophysical Research Letters*, 2015.
[onlinelibrary.wiley.com/doi/10 ... 02/2015GL064088/full](https://onlinelibrary.wiley.com/doi/10.1029/2015GL064088/full)

Provided by Brown University

Citation: Study suggests active volcanism on Venus (2015, June 18) retrieved 23 March 2023 from <https://phys.org/news/2015-06-volcanism-venus.html>

This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.