

Volcanic activity on Mars could offer clues to planet's history

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From literature to the Big Screen, the fascination with the planet Mars has taken many forms. In the geology department at Mercyhurst College, that attraction currently surrounds three of the planet's oldest and most explosive volcanoes known as highland paterae. These distinctive landforms will be studied extensively by a team of faculty and student researchers this summer, thanks to a \$137,000 NASA grant awarded to Dr. Nicholas Lang, first-year assistant professor of geology at Mercyhurst.

"The purpose of the study is to increase our understanding of this unique and early style of [volcanic activity](#) on [Mars](#), which we hope will provide us with a greater understanding of the history of the planet," Lang said.

Unlike volcanoes in Hawaii and many of the volcanoes on Mars known for effusive, or gentle, eruptions, the morphology of the now extinct highland paterae - which have a large central caldera and extensively channeled and ash-covered flanks - suggests a history of enormous explosions.

That explosive activity, Lang said, may have implications for water sources on Mars. Mars' atmosphere is now too thin and its temperature too cold to allow [liquid water](#), but that may not always have been the case. At one time, Mars may have had extensive amounts of surface water and groundwater that may have shaped the topography that now exists on the planet, particularly the chaotic-looking terrain that surrounds some highland paterae.

Lang said the interaction of basaltic magma at the site of highland paterae, when mixed with water, could have intensified the volcanoes' eruptions.

Further, he noted, "When you put volatiles into the atmosphere, you have to consider what impact that may have on a planet. Some think the early conditions of Mars were more Earth-like in terms of pressure and temperature conditions. What happened?"

Lang and his students will do their part to discover more about the history of the planet by collecting and analyzing available data, mostly accessed online, from high-resolution spacecraft images.

"This is an opportunity for our students to get involved in frontline research and contribute to advances in the field of Mars' research," Lang said. "It also enables them to develop valuable research skills that will be crucial to their pursuit of graduate school and career placement."

Source: Mercyhurst College

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