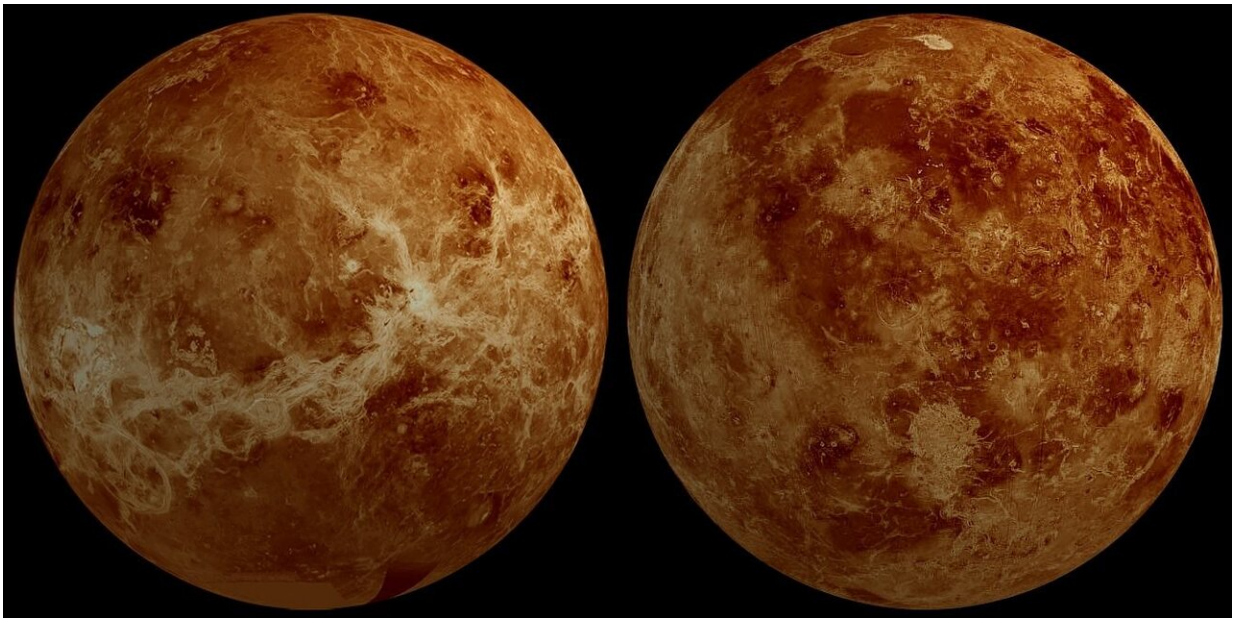


Making the case for slingshotting past Venus on the way to Mars

July 9 2020, by Bob Yirka



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A team of researchers from the Johns Hopkins University Applied Physics Laboratory, North Carolina State University and NASA, has proposed, via whitepaper, that NASA should direct its Mars-bound spacecraft to fly by Venus first. In their paper, uploaded to the arXiv preprint server, the researchers outline their arguments for an opposition mission, as opposed to a conjunction mission.

NASA has made it very clear to the public that it plans to send astronauts to Mars in the near future. What the agency has not revealed is whether such flights will be conjunction or opposition missions. In a conjunction mission, a rocket is launched from Earth and flies to Mars with no stops along the way—such missions are only undertaken when the two planets are nearest each other. Opposition missions, on the other hand, include one or more stops along the way. In their [paper](#), the researchers argue for an opposition mission in which the spacecraft would first fly to Venus and then on to Mars.

The researchers suggest that a [mission](#) that includes a Venus stopover would provide benefits both to NASA and the astronauts aboard such craft. They note that stopping by Venus would greatly reduce [fuel costs](#) because the spacecraft could use Venus's gravity as a springboard to Mars. They also note that taking the Venus to Mars route would allow the spacecraft to return to Earth sooner should something go wrong. They also note that a Venus flyby would allow for a more hands-on approach to studying Venus—astronauts could control research drones in real time. Without such a presence, those controlling drones have to contend with the [time delay](#) as messages travel between Earth and Venus, which can take anywhere from five to 28 minutes. Perhaps most importantly, the researchers note, the window of opportunity would be greatly reduced. Earth and Mars only ever align for [space travel](#) every 26 months, which means astronauts on such a craft would have to spend more than a year on or near Mars. With opposition missions, the window is reduced to just 19 months.

More information: Human Assisted Science at Venus: Venus Exploration in the New Human Spaceflight Age, arXiv:2006.04900 [astro-ph.IM] arxiv.org/abs/2006.04900

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