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# EnVision: understanding why our closest neighbour is so different

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EnVision was selected as ESA's 5th Medium-class mission in the Agency's Cosmic Vision plan, targeting a launch in the early 2030s. EnVision's overarching science questions are to explore the full range of geoscientific processes operating on Venus. It will investigate Venus from its inner core to its atmosphere at an unprecedented scale of resolution, characterising in particular core and mantle structure, signs of past geologic processes, and looking for evidence of past liquid water. Far more than a simple radar mission, this suite of investigations works together to comprehensively assess surface and subsurface geological processes, interior geophysics and geodynamics, and atmospheric pathways of key volcanogenic gases, which together illuminate how and why Venus turned out so differently to Earth. Recent modeling studies strongly suggest that the evolution of the atmosphere and interior of Venus are coupled, emphasizing the need to study the atmosphere, surface, and interior of Venus as a system.

EnVision is an ESA Venus orbiter mission formulated in collaboration with NASA; As a key partner in the mission, NASA provides the Synthetic Aperture Radar, VenSAR. The EnVision payload consists of five instruments provided by European and US institutions. The five instruments comprise a comprehensive measurement suite spanning infrared, ultraviolet- visible, microwave and high frequency wavelengths, complemented by the Radio Science investigation exploiting the spacecraft TT&C system. All instruments in the payload have substantial heritage and robust margins relative

to the requirements with designs suitable for operation in the Venus environment. This suite of instruments was chosen to meet the broad spectrum of measurement requirements needed to support EnVision science investigations.