



**VEXAG Assessment of the National Academies' Planetary Science Decadal Survey  
(Visions and Voyages, 2013-2022)**

**Findings:**

1. VEXAG supports the recommendations of the Decadal Survey for an exciting and balanced exploration of the solar system. VEXAG endorses the recommendations for frequent, regular New Frontiers and Discovery missions, with somewhat higher cost caps, as well as supporting strongly the Supporting Research and Technology Development Programs.
2. VEXAG is pleased to see the Venus Climate Mission recommended as one of the large missions to be conducted within the decade based on the 2013 Decadal Survey priority list.
3. VEXAG will pursue creation of an International Focus Group for the Venus Climate mission recommended by the Decadal Survey (Visions and Voyages, p. 9-21). This group will have representatives from world's space faring nations capable of and interested in exploring Venus collaboratively with NASA in accordance with the Decadal Survey international collaboration recommendation (Visions and Voyages, p. 9-26).

VEXAG urges NASA to embark on the Venus Climate Mission Science Definition Working Team towards a realizable mission architecture within the decade with international participation/coordination/collaboration at a reduced cost to NASA.

4. VEXAG fully supports the VISE New Frontiers Mission as fundamental science. VEXAG notes that other key science objectives might also be accomplished within the New Frontiers-4 and 5 opportunities.
5. VEXAG notes that the harsh environment of the surface and lower atmosphere of Venus presents challenges for externally deployed instruments, long-lived surface missions, and mobile platforms. VEXAG emphasizes that technologies such as high temperature electronics and materials require significant and immediate investment to enable or extend the capability of future Venus missions to explore the lower atmosphere and surface.
6. VEXAG notes that the publication of the 2013-2022 Planetary Survey marks two full decades since Magellan arrived at Venus to begin mapping the surface of Venus with SAR. The enormous success of this mission led to many important questions about Venus and highlighted its significance for a better understanding of our home planet. However, a lack of new missions by the USA has led to a very diminished active Venus community, supported by only ~3% of the R&A



budget. The size of the community may be now below a critical mass, making it difficult for research panels to include knowledgeable scientists. The significance of a successful mission in attracting brilliant young scientists is evident from ESA's Venus Express mission, and VEXAG hopes that Venus missions will succeed similarly in the near future towards the science returned consistent with the Decadal Survey's three cross-cutting themes (Building New Worlds, Planetary Habitats and Workings of Solar Systems) by exploring Venus.

7. NASA's support of the Participating Scientist program for Venus Express (and also for the curtailed Akatsuki/Venus Climate Orbiter mission from JAXA) has been laudable and consistent with the Decadal Survey recommendation regarding international collaborations, and VEXAG encourages expanding support for future Participating Scientist programs with Venus Express and any other future missions.
8. In the next decade, in absence of orbiting spacecraft around Venus, the sub-orbital program element under ROSES may become the major means of Venus observations from a long-lived Earth based balloon-borne stratospheric telescope. VEXAG urges NASA to fund the sub-orbital program adequately to enable such flights that may provide up to several months long balloon missions as also recommended by the Decadal Survey.

For the VEXAG Steering Committee

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