

VEXAG Steering Committee



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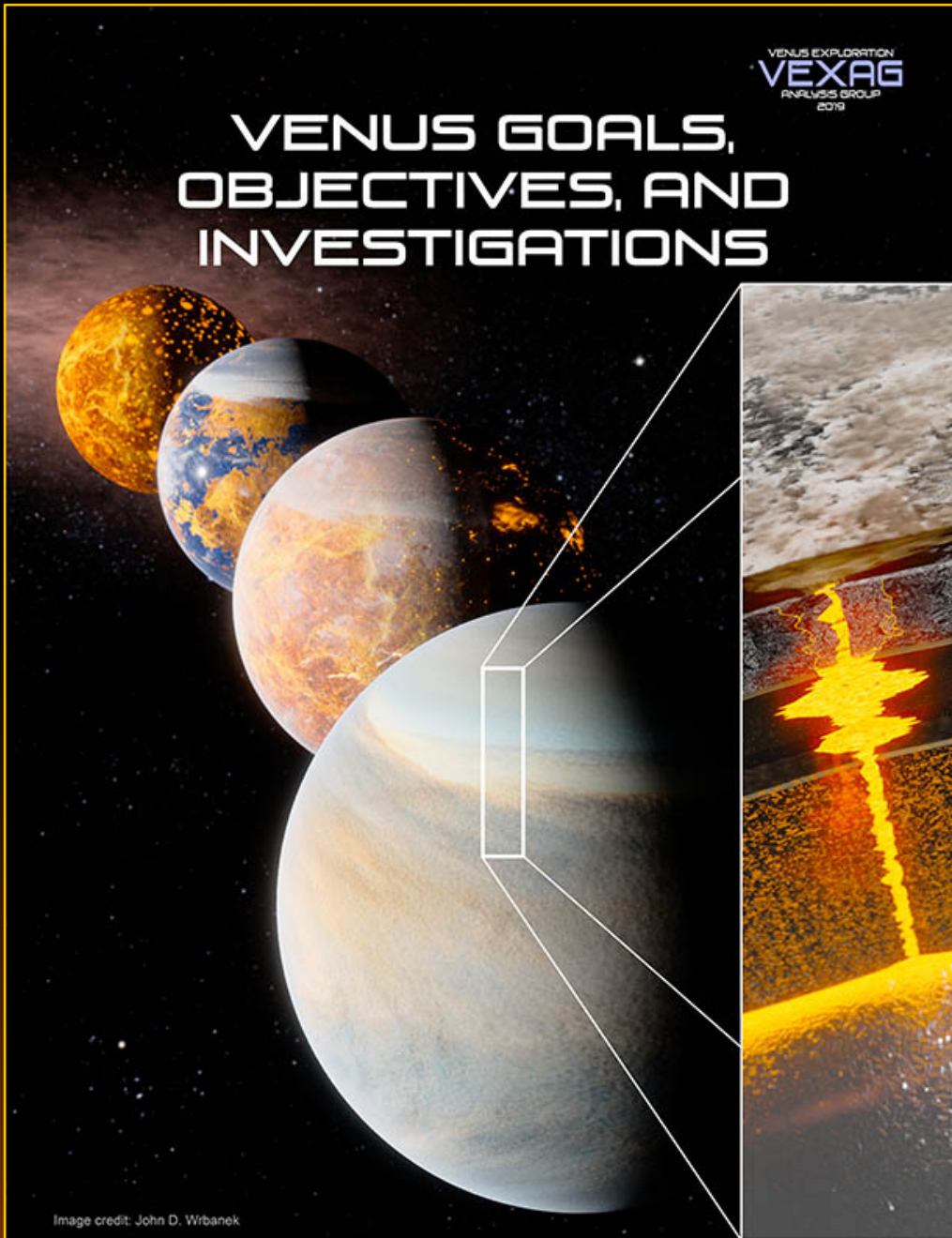
VEXAG Near-Term Goals

- Provide **support for the Decadal Survey**
 - 3 documents nearly in press, paper in *Space Science Reviews*
- Build a **Venus program!**
 - **Engage the community** to come together with a common vision
 - **Improve communication** within Venus community and among the general public: new listserve has >500 members, **media outreach**
 - Open meetings and **public forums**
 - Expand **visibility of Venus science** at conferences and at NASA: 67 Venus papers at DPS/EPSC, AGU session and Town Hall



Preparations for Decadal Survey





Goal #1. Understand Venus' early evolution and potential habitability to constrain the evolution of Venus-sized (exo)planets

- A. Did Venus have temperate surface conditions and liquid water at early times?
- B. How does Venus elucidate possible pathways for planetary evolution in general?

Goal #2. Understand atmospheric composition and dynamics on Venus

- A. What processes drive the global atmospheric dynamics of Venus?
- B. What processes determine the baseline and variations in Venus atmospheric composition and global and local radiative balance?

Goal #3. Understand the geologic history preserved on the surface of Venus and the present-day couplings between the surface and atmosphere.

- A. What geologic processes have shaped the surface of Venus?
- B. How do the atmosphere and surface of Venus interact?



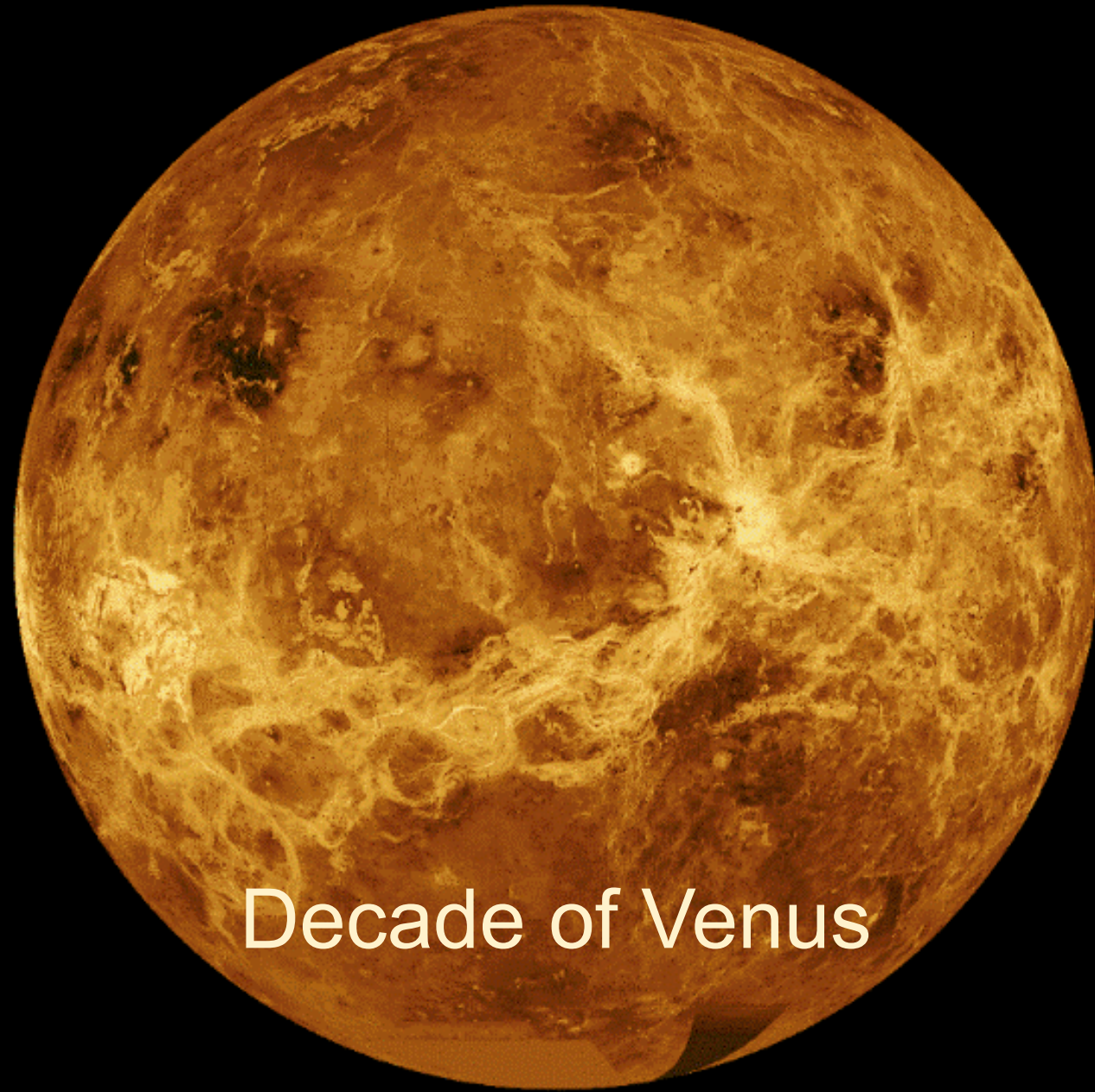
Table 1. Major Needs Arising from This Study

Area	Needs
Entry Technology	Funding to ensure the entry technology capability does not atrophy
Subsystems	Development of high temperature electronics, sensors, and high-density power sources for the Venus environment with increasing capability
Aerial Platforms	A competitive program to determine which Variable Altitude balloons approach is most viable
In situ Instruments	Adaptation of flight-demonstrated technology and development of new instrument systems uniquely designed for the Venus environment
Communications and Infrastructure	Study of the feasibility of and methods for establishing a Venus communications and navigation infrastructure
Advanced Cooling	Investments in highly efficient mechanical thermal conversion and cooling devices
Descent and Landing	New concepts for adapting precision descent and landing hazard avoidance technologies to operate in Venus' dense atmosphere
Autonomy	Transitioning of automation and autonomous technologies to Venus-specific applications
Small Platforms	Development of small platform concepts in addition to larger missions, as well as a new mission type designed around small platforms
Facilities and Infrastructure	Support of laboratory facilities and capabilities for instrument and flight systems, including critical technologies to avoid atrophy of capabilities
Modeling and Simulations	Establishment of a system science approach to Venus modeling
Unique Venus Technology	Continued and expanded support for programs such as HOTTech, and other technology development

VEXAG White Papers

Drafts due Nov. 6, 2019
Round robin discussions
at VEXAG

1. Noam Izenberg: EMPIRE Strikes Back: Venus Exploration in the New Human Spaceflight Age
2. Stephen Kane: Venus as a Nearby Exoplanetary Laboratory
3. Marty Gilmore: Venus Flagship report (only if not funded)
4. Tibor Kremic/Gary Hunter: LISSEe, VBOS, etc. small platforms for long-lived surface missions
5. Gary Hunter: High temperature electronics, recent advancements
6. Raj Venkatapathy: HEEET
7. Jim Cutts: Aerial platform update to prior report, with ore emphasis on exploring the habitable zone
8. Joe O'Rourke: Searching for crustal remanent magnetism...
9. Kevin McGouldrick: Venus atmosphere/weather
10. Emilie Royer: Airglow as a tracer of Venus' upper atmosphere dynamics
11. Sue Smrekar: Venus tectonics and geodynamics
12. Joern Helbert: Orbital spectroscopy of Venus
13. Amanda Brecht: Coupling of 3D Venus models and innovative observations
14. Jenny Whitten: Venus tessera as a unique record of extinct conditions
15. Sanjay Limaye: Venus as an astrobiological target
16. Attila Komjathy: Investigating dynamical processes on Venus with infrasound observations from balloon and orbit
17. Pat McGovern: Venus as a natural volcanological laboratory
18. Helen Hwang: Thermal Protection System Technologies for Enabling Future Venus Exploration
19. Alison: Venus facilities and applications for them for technology development and science investigations
20. Allan Treiman/Molly McCanta: Experimental work for understanding Venus
21. Frank Mills: Carbon, oxygen, and sulfur cycles in Venus' atmospheric chemistry
22. Eliot Young: Ground-based observations of Venus in support of future missions
23. Glyn Collinson: Space plasma science questions and technologies
24. Colin/Sanjay: Coordination and strategy for international partners and collaborations for Venus: future fly-bys and international missions?



Decade of Venus