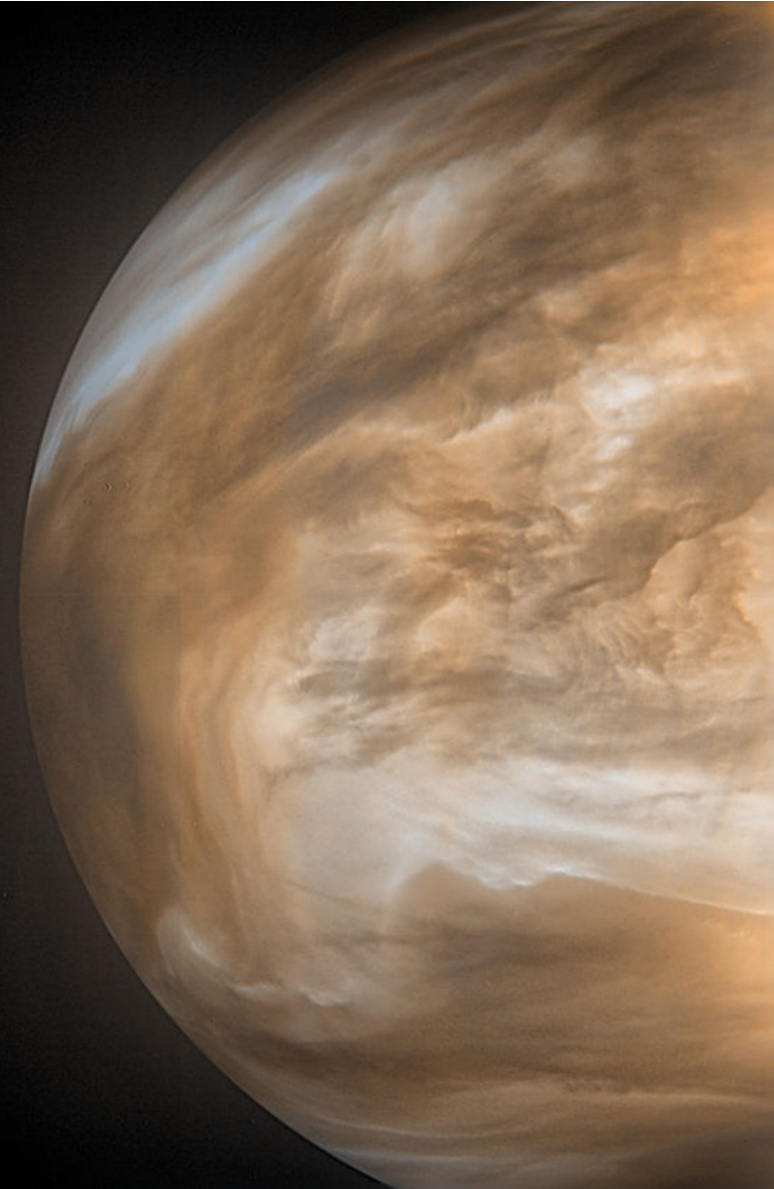


Venus Exploration Analysis Group (VEXAG) Town Hall LPSC XLIX

March 22, 2018

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Agenda



12:15 - Welcome and Recent Highlights in the Venus community

Certificates of Appreciation

Recap of VEXAG Activities

Focus Groups for updating VEXAG's Documents

Venus Bridge Study

Flagship Study for Next Decadal Survey

12:45 – Jim Green, Director of NASA Planetary Science Division

1:00 – Discussion

1:15 - Adjourn

Later Today:

***VEXAG Early
Career Scholars
Focus Group
Informal Meet
and Greet
Acqua Lounge
immediately
following this
afternoon's oral
sessions***

VEXAG Steering Committee

Robert Grimm (Southwest Research Institute), Chair
Martha Gilmore (Wesleyan University), Deputy Chair
Giada Arney (NASA GSFC)
Lynn Carter (Univ. Arizona)
James Cutts (JPL), Roadmap Focus Group Lead
Candace Gray (NM State U.) Early-Career Rep.
Gary Hunter (NASA GRC), Technol. Focus Group Lead
Noam Izenberg (APL)

Kevin McGouldrick (Univ. Colorado)
Joseph O'Rourke (ASU), Early-Career Rep.
Paul Steffes (Georgia Tech. University)
Allan Treiman (Lunar & Planetary Institute),
Goals, Objectives, and Investigations Lead
Constantine Tsang (Southwest Research Institute)
Tommy Thompson (JPL), Scribe
Adriana Ocampo (NASA HQ) ex officio

Venus Missions

- 2 of 5 **Discovery** Phase A finalists in 2016 were Venus, but neither selected.
 - NASA assures no bias against Venus
- Three Venus proposals to **New Frontiers** 2017—none selected for Phase A.
 - VOX was Cat 1
- 4 **Venus PSDS3** studies - final reports to be delivered to HQ in March/April
- **Venus Bridge** study — \$200M cap, report to AA in March.
- **Flagship** study — authorized by HQ for 2018 (GSFC)
- **VeGASO** (ESA BepiColombo, NASA Parker Solar Probe, ESA Solar Orbiter)
 - Only BC is committed
- **Venera-D** (Russia) — Joint SDT; include US element (aerial platform?); launch 2026 to 2031
 - Pending funding, completion of lunar program, and selection ahead of Phobos.
- **EnVision** (ESA) — M5 Phase A selections anticipated in May.
- **Akatsuki** (JAXA) — continues to astound after 2015 rescue, likely ext. into 2021.

Recent Meetings & Presentations

NRC Decadal Survey Mid-Term, May 4-5, 2017, Nat'l Academies, Washington, DC

Venus Modeling Workshop, May 9–11, 2017, Ohio Aerospace Inst., Cleveland

Low-Cost Planetary Missions Conf., August 15-17, 2017, Caltech, Pasadena.

Venera-D Modeling Workshop, October 5-7, 2017, Moscow, Russia.

15th Meeting of the Venus Exploration Analysis Group, November 14–16, 2017,
Applied Physics Laboratory, Laurel, Maryland

NASA Planetary Advisory Committee, Feb 27–28, 2018, Washington, DC.

Upcoming Presentations & Meetings of Interest

Venus Bridge Report to NASA SMD AA, April(?) 2018

ESLAB-52 Symposium on Comparative Aeronomy and Plasma Environment, May 14-18, Noordwijk, the Netherlands.

International Planetary Probes Workshop, June 11-15, 2018, Boulder CO

42nd COSPAR, July 14-22, 2018, Pasadena.

Comparative Climatology of Terrestrial Planets III, Aug 27–30, 2018, Houston.

Int'l Venus Conference, Sept 11-14, 2018, Niseko, Hokkaido, Japan.

16th Meeting of the Venus Exploration Analysis Group, November 2018.

VEXAG Activities & Agenda

- Identify scientific priorities and opportunities to NASA.
- Develop & update guidance documents
 - Goals, Objectives, and Investigations (GOI) TBR 2018
 - Technology Plan TBR 2018
 - Roadmap TBR 2018
- Propagate priorities to NRC Decadal Surveys (next: 2020)
 - Flagship study 2018-19, white papers 2019.
- Foster next generation of researchers



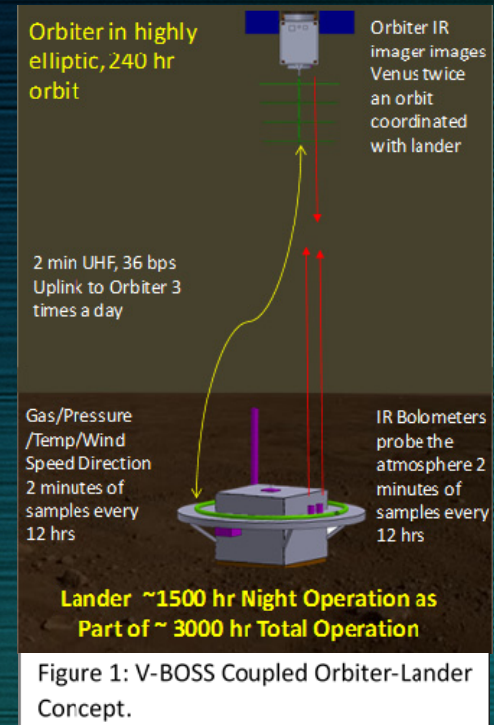
Findings of VEXAG Meeting #15

VEXAG ...

1. Requests that NASA begin implementation of a balanced program of Venus exploration, consisting of elements drawn from Flagship, New Frontiers, Discovery, and smallsat missions.
2. Recognizes the value of NASA's continued engagement in international missions to Venus.
3. Reaffirms its endorsement of the Venus Gravity Assist Science Opportunity (VeGASO) Program.
4. Encourages NASA to continue the HOTTech program and solicit new proposals in ROSES 2018.
5. Supports the ongoing Venus Aerial Platforms (VAP) study and requests a new competed program to continue technology development.
6. Encourages NASA support for a Venus Surface Platform Study
7. Encourages NASA to resume annual solicitation for the Early Career Fellowship (ECF) Program and to continue supporting other opportunities for early career scientists.
8. Encourages NASA to form a cross-divisional research program for Comparative Climatology of the Terrestrial Planets (CCTP).

Venus Bridge

- Outcome of AA inquiry “what can you do for \$200M?” post-Disco-decision.
- Focus Group convened summer 2017 and assessed useful science and technology architectures likely to fit within nominal cost cap.
 - Decided on linked orbiter + in situ element, launch in early-mid 2020s
- Separate design studies by GRC and JPL
 - GRC: “V-BOSS” orbiter and long-lived lander
 - JPL: 5 orbiter mission types + atmospheric skimmer, probe, or balloon
- Mission concepts include robust, complementary science
- \$200M target likely requires some technology development and operations costs outside cap.



Venus Flagship Study

- Identify science objectives, investigations and mission architectures for a Flagship-class mission to Venus
- Nominal schedule to begin late 2018 and last ~one year
- Report to be ready prior to Decadal Survey scheduled to commence early 2020
- Science Definition Team led by two co-chairs TBD
- SDT membership solicited by NASA and selected with input from co-chairs
- Architecture study will be done at GSFC

We're Ready to go to Venus

- The Venus community continues to demonstrate the fundamental planetary science that can and must be done at Venus
 - Mature Cat 1 mission concepts in Discovery and New Frontiers
 - Healthy technology development concepts in HOTTECH, PICASSO, MATISSE
 - Innovative papers in the Venus literature and strong conference attendance. Links to planetary habitability and exoplanets.
- The Venus science community is poised with mature mission concepts, intellectual capital, and experience. We must continue to build NASA advocacy and recognition by planetary scientists and the public at large.

Venus Town Hall Meeting - Thursday, March 23, 2017



Certificate of Appreciation

Noam Izenberg, Applied Physics Laboratory - in appreciation of his steadfast and outstanding leadership for implementing the very successful VEXAG Meeting 15, Applied Physics Laboratory, November 2017

Gary Hunter, NASA Glenn Research Center - In appreciation of his steadfast and outstanding leadership of the Venus Bridge COMPASS Study - 2017–2018

Jim Cutts, Jet Propulsion Laboratory - In appreciation of his steadfast and outstanding leadership of the Venus Bridge JPL Architecture Studies.- 2017–2018

Giada Arney, NASA Goddard Space flight Center - In appreciation of her steadfast and outstanding leadership of the VEXAG's Early-Career Scholars Outreach Focus Group, 2016–2017