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*Planetary Science Sub-committee Meeting*

# **VEXAG Status Update**

by

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***Co-Chairs***

*26 January 2011*

*<http://www.lpi.usra.edu/vexag/>*

# Recent Events

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## Completed:

- **VEXAG** workshop, “Venus Atmosphere: From surface to thermosphere” held in Madison, Wisconsin during 30 August – 2 September, followed by the 8<sup>th</sup> VEXAG meeting
- Special issue of **Icarus**, “*Advances in Venus Science*”, will be published in late summer 2011. Nearly 40 papers have been submitted and going through the review process. *Drossart*, *Limaye* and *Smrekar*, are Guest Editors.
- NASA selected 7 PSs for **Akatsuki** mission in November 2010, including two PSiRs
- Unfortunately **Akatsuki** orbit insertion was not successful and the spacecraft is in a solar orbit with ~ 200 day period. JAXA will attempt VOI-2 in five to six years pending further tests of the motor.
- Akatsuki Team has expressed its intent to continue participation in **VEXAG** activities
- EU Ministers have extended funding for continuation of **Venus Express** operations through end of 2014 and spacecraft continues to operate normally

## Students/Young Scientists and Understanding Venus/Earth like planets:

- Comparatively, it appears that there is a very low in-flux of students and young scientists in Venus research.
  - Lack of new missions to Venus and data
  - Fewer successful Venus proposals in ROSES
  - (Venus Express PS program is important, but funding too low to support students/post docs)
  - Akatsuki did not have a successful VOI in December 2010, although JAXA will attempt again in 2015-2016.
- The community is hopeful of a supportive Decadal Survey Report regarding exploration of Venus to understand greenhouse planets everywhere.
- VEXAG hopes to involve students more directly (to be explored at LPSC)

# Future Opportunities to Explore Venus under consideration

- **SAGE** submitted a CSR for the 3<sup>rd</sup> New Frontiers AO
- Two Proposals submitted to ESA's Cosmic Vision with some US Scientist involvement and requested a review by NASA (**EVE**, a long lived balloon mission, and **EnVision**, a radar orbiter)
- Several Proposals submitted to the Discovery Program
- **Venera-D** being developed by Russia for launch nominally in 2016

Also, Looking at some low-cost (compared to flight missions) earth stratospheric balloon borne concepts to observe Venus with some collaborative efforts.

This has promise of returning some new science data quickly (~2014)

# Upcoming Activities

- Initiate some efforts to attract graduate students
  - Venus Speakers Bureau for supporting speakers at universities and research centers
- 9<sup>th</sup> VEXAG Meeting and Science Conference on Earth Based Venus Observations, New Venus Results from Venus Express and Future Missions
  - East Coast (tentatively at the National Aerospace Institute), 30 August – 2 September, 2011
- Town hall meeting at LPSC (Thursday)
  - “Students and the Exploration of Venus in the Coming Decade”

# 2010 Venus Atmosphere: Surface to Thermosphere

[venus.wisc.edu/workshop](http://venus.wisc.edu/workshop)

2010 VEXAG International Workshop  
**Venus, Our Closest Earth-like Planet:  
From Surface to Thermosphere - How does it Work?**  
Madison, Wisconsin, USA | 30 August - 2 September 2010

**Presentations**

NAME (Last, First)	PRESENTATION TITLE/TOPICS	AFFILIATION
Adams, Jordan	VORTEX: A Mission Concept Study To Venus	College of Charleston
Bak, Minju	Hydrocarbons and Organics on Venus: Where Are They Now?	University of Michigan
Balot, Tibor	Venus Aerial Robotic Concepts: In the Clouds & Near the Surface	Jet Propulsion Laboratory
Barlow, Joanna	Venus Cloud Properties from Venus Express WRTG Observations	University of Oxford
Belyaev, Denis	SO2 observations above Venus' clouds by SPICAV/SOIR	ONERA
Berthel, Michael	Venus Orbiter Recon and Tandem Environmental Exploration	University of Alabama - Huntsville
Bhatt, Shivan	Venus observations with 2-M HCT, Harle-Ladakh	Indian Institute of Astrophysics
Bouguer, Stephen	Dynamics, O2 Nightglow, and Ionospheric Chemistry of the Venus Upper Atmosphere: Interpretation of Venus Express Data sets Using the VSOCA	University of Michigan
Brecht, Amanda	Modeling Night Airglow Emissions and the Variability	University of Michigan
Bullock, Mark	Visualizing the surface of Venus	Southwest Research Institute
Coxsey, Carl	Atmospheric structure and dynamics	Lawrence Livermore National Laboratory
Brossart, Pierre	The VIRTIS Experiment on ESA/Venus Express: Investigations from Surface to Thermosphere	Observatoire de Paris
Expofish, Larry	SAGE: A proposed New Frontiers Mission to Land on Venus	University of Colorado
Fedorova, Anna	Water vapour in the Venusian atmosphere with SPICAV/SUNEC	Space Research Institute (IKI)
Ghall, Richard	The Case for InGaP at Venus	Imperial College London
Glaze, Lori	Role of volcanism in atmospheric evolution	NASA Goddard Space Flight Center
Grisposon, David	Coupled Surface-Atmosphere Evolution of Venus	Denver Museum of Nature & Science
Hansen, Vicki	Equilibrium resurfacing of Venus: Is it possible? Results from new Monte Carlo modeling and implications for Venus surface history	University of Minnesota - Duluth
Herbert, Alin	The near infrared emissivity of the Venus surface: Observations by Venus Express and MESSENGER and a new program of high-temperature laboratory measurements	DLR - Institute for Planetary Research
Hilink, Tobias	Face of tectonic nodes on Venus and Earth and atmospheric Argon	Rice University
Hoshino, Masaya	Effects of atmospheric waves on the CO2-127 um nightglow distribution in Venus	Tohoku University
Isomura, Takashi	Science plan of Japanese Venus orbiter, Akatsuki	Japan Aerospace Exploration Agency
Johnson, Malasha	Venus Pressure Chamber: A Small Testing Facility for the Community	NASA Goddard Space Flight Center
Krasnopolsky, Vladimir	Spatially-Resolved High-Resolution Spectroscopy of Venus: Variations of CO2, CO, HF, HCl, HDO, OCS, and SO2 at the cloud tops, OH and O3 Nightglow	Catholic University of America
	Models of Atmospheric Composition and Chemistry on Venus	

**Deadlines:**

- Workshop participation indication form ..... 15 May
- Extended abstracts ..... 25 July
- Hotel reservations ..... 30 July

**Co-located:**

- Site General (VEDAG Co-Chair)
- Stargazing (VEDAG Co-Chair)
- Astronomy Outreach (NASA/HC)

Presentations and abstracts posted at:

[venus.wisc.edu/workshop](http://venus.wisc.edu/workshop)

- 60 Papers presented
- Extended Abstracts Volume published on CD-ROM
- Presentations and Extended Abstracts posted on the web ([venus.wisc.edu/workshop](http://venus.wisc.edu/workshop))
- Special Issue of Icarus
- Co-located STEM Workshop for Educators (113) from the Midwest with Wisconsin DPI and NSF Funded National Girls Collaborative Project
- Venus Scientists participated in the STEM Workshop
- Public Program with three speakers (three halls filled) and on city cable channel
- Videos posted on the web

# Venus International Workshop – 2010



VisualLightBox.com

# Public Presentations

[http://venus.wisc.edu/video\\_public.html](http://venus.wisc.edu/video_public.html)

**esa** **NASA**

## Venus Express

Education & Public Outreach

**Video**

### Impacts, Planetary Climates, and Venus!

**Description:** A free public program sponsored by NASA's Venus Exploration Analysis Group. This event was held on 31 August 2010 in conjunction with 2010 Venus International Workshop. Event features Jan Smit, David Grinspoon, and Bill Nye the Science Guy on topics ranging from Chicxulub impact to climate catastrophes in solar system and on earth.

**Chicxulub Impact Atmospheric Disturbances and Mass-extinctions: Lessons for/rom Venus?**  
Jan Smit, VU University Amsterdam, Netherlands

**Climate Catastrophes in the Solar System**  
David Grinspoon, "Science Dude"  
Denver Museum of Nature & Science

**Impacts, Planetary Climates & Venus!**  
A Program Sponsored by NASA's Venus Exploration Analysis Group  
**FREE!**  
What can they teach us about our own planet **Earth?**  
Jan Smit  
VU University Amsterdam  
David Grinspoon  
Denver Museum of Nature & Science  
Bill Nye "The Science Guy"  
Executive Director, the Planetary Society

7:00 PM, Tuesday, 31 August 2010  
Lessons Hall of the Monona Terrace Convention Center  
1 John Nolen Dr, Madison, WI • [www.mononaterrace.com](http://www.mononaterrace.com)  
SSEC

# STEM Workshop held during the Workshop

**Venus Express**  
Education & Public Outreach

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EPO Overview | Teacher Workshops | Curriculum | EPO Events |

### Teacher Workshops

Please contact us if you would like to arrange a Venus Express presentation for your school, club, or community.

#### Event Highlights

##### Promoting STEM Careers for Girls Educator Workshop - Featuring Bill Nye "The Science Guy"

31 August 2010, Madison, Wisconsin, USA

A one day workshop was conducted for STEM educators at the Monona Terrace Convention and Community Center on 31 August 2010. Over 110 educators and other STEM professionals as well as high school students from the Upper Midwest attended the program which focused on promotion of STEM careers for young women. The workshop was jointly sponsored and developed by the NASA's Venus Express E/PO project, the Wisconsin Girl's Collaborative Project (Wisconsin Department of Public Instruction), and the National Girls' Collaborative (NSF). The workshop was held in conjunction with the 2010 International Venus Workshop (NASA/VEXAG), which allowed presentations by leading Venus scientists, including Dr. Sanjay Limaye and Dr. Kevin Baines. Graduate student, Hsuan-Yun Pi provided support for program development and led the "Venus Cloud Tracking" mini-workshop. The Planetary Society sponsored Bill Nye "The Science Guy" as a featured guest speaker for the workshop.

[workshop program]

#### Workshop Album

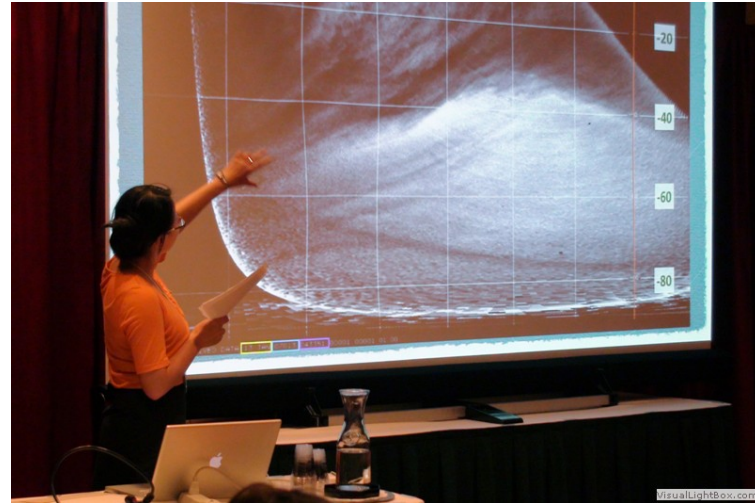
# Science, Education, Outreach and Recognition



# STEM Careers Panel



# Curriculum Activity Training during the workshop



# New Venus Results

- Volcanoes still active?
  - Smrekar et al. (high NIR emissivity features co-located with hotspots)
  - Bondarenko et al. (warm anomalies)

*Bright “clouds” in Venus Express  
-VMC images occasionally..  
What causes them?*

*Venus Express is documenting the range of morphologies exhibited by the hemispheric vortex which is crucial for understanding the puzzling superrotation of the atmosphere*

