

ROSES Outreach Supplement

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Venus: Understanding the Greenhouse Planet

Annual Progress Report
1 January 2012 – 31 December 2012

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1. Annual Progress Report – 1 January 2012 – 31 December 2012

The European Space Agency's Venus Express, is the first mission to investigate our closest neighbor from orbit since NASA's last mission to Venus, Magellan, which collected surface reflectivity and topography data using a radar instrument from 1983 through 1989. In contrast, Venus Express carries no radar, but exploits new tools and instrumentation to observe the Venus atmosphere and even the surface, at low spatial resolution through near infrared observations. The E/PO efforts for the numerous Mars missions have highlighted the achievements of surface landers and rovers that have been addressed by a dedicated Mars E/PO Program. In contrast, Venus is served at present with a very modest effort which we have sustained by leveraging ongoing activities and partnerships and by exploiting the limited existing available resources and networks to conduct an effective E/PO initiative with a very minimal budget.

2. Education Activities Conducted

2012 was a special year due to the occurrence of the rare transit of Venus on 6 June 2012. Several additional efforts were undertaken to present the significance of this event on the local, regional, national and international levels.

Over the past year the Venus Express Education and Public Outreach (E/PO) effort has continued to strive to represent the ongoing research activities of the NASA funded scientists working in collaboration with the European Space Agency's Venus Express mission. During the past funding period, major highlights and achievements include: (i) a dedicated web presence (venus.wisc.edu) that has been updated with Venus events and content, (ii) teacher training and support of the baseline Venus Cloud Tracking Curriculum module (with leveraged support), (iii) public lectures and presentations targeting urban, minority youth, and (iv) programs to encourage the observing of the last transit of Venus in our life times that took place on 6th June 2012.

In spite of the relatively small level of funding, the website has been consistently maintained and updated, and we were able to support several significant activities based on the solid foundation established through our consistent efforts in the previous two years. The majority of effort was focused on ongoing maintenance of a web presences and formal education activities, including upgrading of computer based VEX data analysis tools, with the greatest potential for long-term, broad utilization.

Special solar filter sunglasses to observe the transit received through the NASA E/PO program were distributed to local observers. Talks were presented by Dr. Limaye locally and on the Wisconsin Education Radio Network. These were broadly

disseminated state wide via the Wisconsin Public Radio and also on the state wide Education Television Channel.

2.1 FORMAL EDUCATION

The Venus Cloud Tracking activity was presented to teachers at two different workshops hosted by the European Space Agency:

EGA/Galileo Teacher Training Program, Madrid, Spain

ESA Teacher Training Program, Noordwijk, Netherlands



Teachers learning the Venus cloud tracking activity during the ESA Teacher Training Workshop. Many of these teachers are committed to incorporating the activity in their classes.

The travel costs were covered by ESA for both of these workshops. We had agreed to participate in the HISTARS 2012 Program during June 2012, however due to the close proximity to the transit of Venus, it was not feasible to participate in this program. We expect to participate once again in 2013.

2.2 INFORMAL EDUCATION

Several presentations on the Transits of Venus were given by Dr. Limaye (See Table 1) in various cities. One interview lasting an hour was carried on the Wisconsin Education Radio Network's University of the Air program hosted by Norman Gilliland and Emily Auerbach prior to the Venus Transit (3 June 2012). The public talk given on the University of Wisconsin campus was disseminated through the state educational television channel and is also archived on the web. Two talks on the Transits of Venus were given at schools.



Audience at Institut Don Bosco in Brussels, Belgium (left) listening to a presentation on the Transit of Venus by Sanjay Limaye with the help of Dr. Severine Robert, a colleague from the Belgian Institute for Research in Aeronomy who acted as an interpreter.

3. Public Outreach and Web Site Updates

Public Talks/Presentations

Dr. Limaye gave several talks to the general public on Venus Express and Transits of Venus (Table 1), including one to the audience at the Annual Meeting of the Association of Lunar and Planetary Observers (ALPO) in Chicago, Illinois (July 2012). A complete list is provided in Table 1 (page 4).

Due to the very small level of funding, we were able to support a limited amount staff time and travel for public outreach events; however updates focusing on current events/links were consistently made on the web site (venus.wisc.edu), including addition of several presentations that can be viewed or listened to via streaming on the web (venus.wisc.edu)

A complete list of is given in Table 1 below.

Section of the front page of venus.wisc.edu pointing to the recent presentations that can be viewed on the web

2012 Transit of Venus

[Click here to read the full story](#)

Watch video of the lecture on "The 2012 Transit of Venus"
(Presented by Dr. Sanjay Limaye)

Listen to the talk of "The 2012 Venus Transit" featured on University of the Air from WPR
(Presented by Dr. Sanjay Limaye)

9th International Planetary Probe Workshop (IPPW-9)

When: 18 - 22 June 2012
Where: Toulouse, France

Summary:
Explore technological challenges and scientific opportunities associated with entry, descent, landing and flight in planetary atmospheres with fellow scientists, technologists, engineers, mission designers, policy-makers and students interested in the exploration of solar system bodies with substantial atmospheres.

Table 1. Support and participation in Education and Public Outreach Events for the Venus Express Mission (venus.wisc.edu).

<u>Date</u> ▼	Event Name	Activities Title	Format	<u>Presenter(s)</u>	Location
24 Jul 2012	Workshop on Venus Science Goals and Missions	Workshop on Venus Science	Lecture / Audience Q/A	Dr. Sanjay Limaye Ann Carine Vandaele Rachel Drummond Anna Fedorova Peter Ford Suzanne Smrekar Alexander Rodin Nadia Evdokimova	Thiruvananthapuram, Kerala INDIA
10 Jul 2012	ESA Teacher Training Workshop	ESA Teacher Training Workshop 2012	Lecture / Demonstration / Group Discussion / Audience Q/A / Hands-On	Dr. Sanjay Limaye	Noordwijk, N/A The Netherlands
7 July 2012	Exploring Venus with Venus Express	Annual Meeting of the Association of Lunar & Planetary Observers	Presentation	Dr. Sanjay Limaye	Chicago, Illinois
3 Jun 2012	University of the Air - Wisconsin Public Radio Interview Taped on 4 may 2012	Radio Interview with Emily Auerbach and Norman Gilliland	Audience Q/A	Dr. Sanjay Limaye	Madison, Wisconsin USA
26 Apr 2012	Transits of Venus Presentation at Wenzgasse School, Vienna, Austria	Presentation	Lecture	Sanjay Limaye	Vienna, Vienna Austria
20 Apr 2012	Colloquim at Max Planck Insittute for Solar System Studies, Lindau-Katlenburg, Germany	Seminar	Lecture	Dr. Sanjay Limaye	Lindau-Katlenburg, Han Germany
4 Apr 2012	Wednesday Nite at the Lab: The 2012 Transit of Venus: 5 June 12	Presentation (Taped for on-line viewing)	Lecture / Audience Q/A	Dr. Sanjay Limaye	Madison, Wisconsin

10 Mar 2012	Super Science Saturday	The Transit of Venus	Lecture / Demonstration / Group Discussion / Audience Q/A / Hands-On	Ms. Rosalyn Pertzborn Hsuan-Yun Pi	Madison, WI Dane
16 Feb 2012	European Space Agency-Galileo Teacher Training Program 2012	Venus Transits: A presentation at the ESA-GTTP Teacher Training Program	Lecture	Sanjay Limaye	Madrid, Majadahon da Spain
27 Jan 2012	Venus Colloquim Series Talk at NASA/Glenn Research Center	Fifty Years of Exploring Venus: What's Next	Lecture	Dr. Sanjay Limaye	Cleveland, Ohio USA
19 Jan 2012	Exploring Venus	Science Cafe	Group Discussion / Audience Q/A	Dr. Sanjay Limaye	Madison, Wisconsin USA

4. Summary

Effective programs in Education and Public Outreach were conducted during the last year under the funding received. We plan to undertake similar efforts in the next year.

5. Acknowledgements

The continuing encouragement and support of the US and ESA Venus Express Team is an ongoing inspiration for our efforts. In particular, we thank the Education Programs Office at European Space Agency for their support and inclusion of Venus Express Education Programs in the teacher workshops. As always, we greatly appreciate our Director, Dr. Henry Revercomb, who continues to recognize the unique contributions and efforts of the Venus Express team here at SSEC (Dr. Sanjay Limaye and Dr. Kevin Baines, Ms. Rosalyn Pertzborn, Director of the Office of Space Science Education (SSEC) and Ms. Hsuan-Yun Pi, Webmaster).