

DENVER MUSEUM OF NATURE AND SCIENCE
VENUS WINDS PROJECT
MINUTES OF MEETING

Date/Time/Location: 30 August 2016 6:00 PM Exploration Studio 102

ATTENDING

Art	Ashley	BeeGee	Christian	Connor	Cristy	Dave
Drew	Dylan	Elizabeth	Emilie	John	Kevin	Mark
Marta	Michael D.	Michael L.	Yvonne			

Guests:

The meeting opened at 6:00 PM in Studio 102. Those **attending** are listed above.

OLD BUSINESS

Image Processing Results–All

We looked at new results from Michael, who cleaned up and co-registered 21 images from Sep 29, 2015, each with circular masks to mask out the sky. He emphasized that this was not the final product, although the co-registration of all 21 images was pretty close. A little re-tweaking of the centering of some of the images, and contrast adjustment of each images should be enough to make this series useful for deriving wind velocities. Art has emphasized that the use of a red circle, such as those provided in Marta’s Photoshop template, might work better to align the night side limb to the edge of the circle. This requires temporarily boosting the contrast of each image so that the night side limb is visible, and then turning down the contrast for optimal contrast of the cloud features.

Reading Assignment – Mark

Mark presented PowerPoint slides on some fundamentals of planetary atmospheric physics and comparisons between the atmospheres of Venus, Earth, early Earth, and Mars. These slides covered the first half of the book chapter that we distributed a few months ago, *Atmospheres of the Terrestrial Planets*, by Jim Pollack, in *The New Solar System*, Cambridge University Press, Third Edition, 1990. We’ll cover the remainder at the next meeting.

Akatsuki Update – Mark

Mark will be attending another Akatsuki science team meeting in Japan from Sep 6-12. He will find out then which new images can be shared with the group at the meeting on Sep 13, and will also report on what Kevin McGouldrick has been up to.

NEW BUSINESS

Google Groups – Mark, BeeGee

Mark showed our Venus Winds Google Group page, with a new welcome message that briefly summarizes our project, and a post with Yvonne’s centered images. During the meeting Mark

added a new post with Michael's most recent centered images. These and other new images and movies can be updated by anyone in the group as they obtain new results. BeeGee showed us how to initiate and conduct a Google Hangout for videoconferencing, which we will use in the future for meetings that Mark can host when he is on travel. Also, we will set up a Google Hangout for every meeting from now on so that folks who would like to participate but can't physically get to the meeting can still join. Integrated into Google Hangout is the ability to share PowerPoint slides or other files and images. BeeGee then showed us how to create calendar events for the whole group, which then automatically updates everyone's '*venus-winds*' calendar on their Google Calendar page. For folks who do not use Google Calendar, this shared calendar and its events can be imported in the '*ical*' format, although we did specifically demonstrate that.

Later on, Art and I walked through setting up his Mac laptop for Google Groups and Google Hangout. If you don't already use Google Hangout, we found that there is a fairly lengthy process of installing the appropriate extensions and app packages before your browser can actually do the videoconferencing. Although Google prompts you how to do this, it is a little tricky and there is some trial and error involved. So if you do plan to join a meeting remotely using Google Hangout, you should probably allow about 30 minutes to get everything installed and working.

POSTPONED

Image Digital Filtering – Mark

It may be possible to correct the subtle but annoying vertical and horizontal striping that plague most of the raw images. These artifacts are probably due to noise in the image detector readout electronics. A mathematical technique called digital filtering can be employed to reduce this kind of periodic noise (every 8 rows) in images. We will discuss this at a later time; it might be subtask that someone in the group who is familiar with digital image processing can try to take on.

Removing Scattered Sunlight from the Images – Mark, Art

Venus' night-side clouds that are closest to the terminator in our 2.3 micron images are washed out because of sunlight scattered from the bright day side crescent to the night side. This part of the image can be enhanced by mathematically subtracting an image of Venus taken at another wavelength. We will discuss the subtraction of images taken with a Bracket-gamma filter (2.16 microns) from the 2.3 micron images to improve cloud contrast near the terminator at the next meeting.

The next meeting will be on 13 September 2016 at 6 PM. Studio 102
Submitted by Arthur C. Tarr, Venus Winds Project Coordinator