

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

Date/Time/Location: 4 December 2014 6:00 PM Exploration Studio 106

ATTENDING

Boudreau	Bullock	Crowl	Diba	Dickerman	Doubek
Farrell	Gehring	Harter	Heil	Knutson	Krider
Lindsay	Logan	McGouldrick	Parziale	Romero	Royer
Stewart	Tarr	Viera	Zimmerle		

Guests: **Sandy Krider**

Researchers at Cape Canaveral for the test flight of Orion (5 Dec): Doubek, Stewart, Viera.

The meeting opened at 6:00 PM at Exploration Studio 106 in the Morgridge Wing. Those **attending** are listed above.

OLD BUSINESS

New velocity measurement exercise: 14 Dec 2010 All researchers

New data from the **14 Dec 2010** image dataset has been made available. Mark has prepared two DropBox folders that contain 1,589 images in FITS format and JPEG format, respectively. Report on your results and experience. Bring nine favorite images, approximately equally spaced in time. We are looking here for the sharpest images – the orientation of Venus doesn't matter, since all 9 images will be co-registered in the next assignment.

Individual sub-group task reports

Sub-group *Slit Removal* (Proposer: Dylan)

Dylan described his progress to remove the slit artifact from the images. Mark discussed his own experiments in doing the same task. If automated, the slit removal feature would measurably improve the quality of the images for analysis.

Sub-group *Improved Online Tools* (Proposer: Ricardo)

Ricardo and an associate have been improving the coordinate recording tool that Ricardo demonstrated at an earlier meeting (November 6). The tool is available for testing at <http://venuswindsproject.org/>. Report your experience and any problems to Ricardo.

Ricardo also suggested an improved method of rapidly examining a series of images for a specific dataset. Discussion followed regarding temporary data storage while the wiki is being restored. This has been accomplished with the release of the two DropBox folders. Additional discussion may be required

Sub-group *Plotting Rotation Curves* (Proposer: Christy)

Christy has agreed to calculate velocity vs. latitude speeds for a solid sphere rotator. She will plot the velocities of points at several latitudes on the surface of a sphere. There will be one curve for an equatorial velocity of 50 m/s, one for an equatorial velocity of 75 m/s, and one for an equatorial velocity of 100 m/s.

Follow up test on 20040712 All researchers

Mark will hand out the first image of 20040712 with nine points marked and annotated with x,y values. These points will be tracked on the eight subsequent images. This exercise is to eliminate variability due to initial selection of tracking points.

NEW BUSINESS

Co-Registration of Images Art and Mark

Art gave a brief report on co-registering images using *Adobe Photoshop*. Two common methods are used for co-registration using a 512x512px mask overlay: either a black mask with a transparent circular opening or a thin circle. The diameter of either is determined from the ephemeris of Venus at the precise time of image acquisition. Art favors the circle method as more accurate for registering the image, especially at the limb at the dark margin.

Mark discussed registration using GIMP open-source software; the registration methods are similar to the procedure when using *Adobe Photoshop* and the newest versions of *GIMP* are in beta status. *GIMP*, in fact, may be preferable because so few researchers own or use *Photoshop*. Other options were briefly discussed: Dave discussed *PhotoMerge*, which is used in conjunction with *Adobe Photoshop Elements*.

New Sub-group *Automated Image Registration* (Proposer: Dave)

Dave will look into the use of *PhotoMerge* in Adobe Photoshop Elements for automating image registration. It may also be useful for interpolating points between images. Both Adobe Photoshop and GIMP may have similar capabilities. An automated method for co-registering images would have obvious labor saving advantage, although a previous analysis of existing algorithms (i.e. autocorrelation) have not worked well.

It was announced that there will **not** be a meeting on December 18.

The next meeting will be on **January 8, 2015** at 6:00 PM in Exploration Studio 106

Submitted by Arthur C. Tarr, Venus Winds Project Coordinator