The Role of Public Interaction with the Juno Mission: Documentation, Discussion, Selection and Processing of JunoCam Images of Jovian Cloud Features

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Among the many "firsts" of the Juno mission is the open enlistment of the public in the operation of its visible camera, JunoCam. Although the scientific thrust of the Juno mission is largely focused on innovative approaches to understanding the structure and composition of Jupiter's interior, JunoCam was added to the payload largely to function in the role of education and public outreach (E/PO). For the first time, the public was able to engage in the discussion and choice of targets for a major NASA mission. The discussion about which features to image is enabled by a continuously updated map of Jupiter's cloud system while Jupiter is far enough from the sun to be observable by non-professional astronomers. Contributors range from very devoted astrophotographers to telescope and video 'hobbyists'. Juno therefore engages the world-wide amateur-astronomy community as a vast network of co-investigators, whose products stimulate conversation and global public awareness of Jupiter and Juno's investigative role. Contributed images also provide a temporal context to inform the Juno atmospheric investigation team of the state and evolution of the atmosphere. The contributed images are used to create s global map on a bi-weekly basis. These bi-weekly maps provide the focus for ongoing discussion about various planetary features over a long time frame. Approximately two weeks before Juno's closest approach to Jupiter on each orbit ("perijove" or PJ), starting in mid-November of 2016 in preparation for PJ3 on December 11, the atmospheric features that have been under discussion and available to JunoCam on that perijove were nominated for voting, and the public at large voted on where to point JunoCam's "elective" features. In addition, JunoCam provides the first close-up images of Jupiter's polar regions from a non-oblique viewpoint for the first time in over 40 years since the passage of Pioneer 11 over Jupiter's north pole. The Juno mission science team also provides additional comments on features from their various points of view, but Juno's science team has no greater weighting in the voting process than the public at large, short of an extraordinary event, such as an impact event or a sudden atmospheric outburst. Public voting was tested for the first time on three regions for PJ3 and has continued for PJ4 and PJ5 with voting on nearly all non-polar images. One of the big challenges in this process was the accurate prediction of which features would be in the field of view at the time of the perijove some 10 days following the end of voting, due to Jupiter's differential rotation. The results of public processing and re-posting of JunoCam images have ranged all the way from artistic renditions up to professional-equivalent analysis that is equivalent to anything JunoCam team members could have produced. All aspects of this effort are available on the Mission Juno web site, linked to the JunoCam instrument (https://www.missionjuno.swri.edu/junocam/).