



Transits of Venus in Public Education and Contemporary Research

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Abstract

Transits of Venus are among the rarest predictable astronomical event that humans can enjoy, and the 2012 transit will be visible by almost all the people on Earth. It is our job as educators to bring out the thrill of being able to see the tiny dot of Venus silhouetted against the solar disk even with just a simple eye-protection filter. My Website at <http://www.transitofvenus.info> brings together not only historical information about the five previous transits of Venus that were observed through the 20th century--1639, 1761, 1769, 1874, and 1882--but also the scientific work carried out at the 2004 transit and at recent transits of Mercury. Based on space observations of the 1999 transit of Mercury with NASA's Transition Region and Coronal Explorer (TRACE), Glenn Schneider and I provided proof of the contemporary explanation of the black-drop effect as an amalgam of instrumental point-spread and solar limb-darkening [1]. Based on observations of the changes in the total solar irradiance during the transit, we provided an analysis of this solar-system analogue to exoplanet transits [2]. High-resolution (0.5 arcsec pixels) observations of ingress and egress with TRACE during the 2004 transit provided information about the visibility of Venus's atmosphere through its refraction of sunlight, interpreted with Venus Express observations [3]. We anticipate observing the 2012 transit with ground-based facilities of the University of Hawaii at Haleakala, and of the National Solar Observatory at Sacramento Peak, and Kitt Peak, as well as with NASA and JAXA spacecraft, including Solar Dynamics Observatory, ACRIMSAT, and Hinode. The Program Group on Public Education on the Occasions of Eclipses and Transits of Commission 46 on Education and Development of the International Astronomical Union, which I chair, looks forward to participating in Education and Public Outreach efforts related to the 2012 transit.

References

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- [3] Pasachoff, J. M., Schneider, G., and Widemann, T.: High-resolution Satellite Imaging of the 2004 Transit of Venus and Asymmetries in the Cytherean Atmosphere, *Astron. J.*, Vol. 141, pp. 112-120, 2011.