

CONQUERING VENUS IN TRANSIT

Chuck Bueter

15893 Ashville Ln.

Granger, IN 46530

bueter@rad-inc.com

Abstract: “Venus, vidi, vici,” or something like that. Events preceding June 8th prepare for the 2004 transit of Venus. Featured snippets include an art exhibit, teacher workshops, liaisons with troops deployed overseas, musical performances, community talks, an exhibit of artifacts, two busy websites, and a planetarium program. Local events in Mishawaka, IN, embraced the transit with overnight telescope viewing, live webcasts, media coverage, solar-filtered and H-alpha telescopes, Transit of Venus Sunrise Ale, and community spirit. See www.transitofvenus.org for images and resources.

Two years ago my daughter created a web page <http://www.transitofvenus.org/sarah.htm> as part of a school project. For it she drew this image <http://www.transitofvenus.org/sarahsunrise2.jpg>. We gussied it up for inclusion in the planetarium program, by making the white sky blue. This is an informed 6-year old’s drawing of what she expected the transit of Venus to look like. Compare this to a series of images <http://www.phys.uu.nl/~bassa/gallery/vt2004seq.htm> taken by Cees Bassa of Utrecht, the Netherlands, during the 2004 transit.

A Toyota TAPESTRY grant paid for production of the planetarium program on DVD with accompanying CD of images; one PLATO grant with Gene Zajac paid for the workshop at last year’s conference to make rear screen projection devices; a second PLATO grant with Art Klinger supported a teacher workshop and “eclipse shades;” and a third PLATO grant helped send “eclipse shades” to troops overseas. We also received generous support from our local Jordan Toyota dealership.

Thanks go to Dale Smith for shipping a copy of the DVD/CD set to every member of GLPA in a timely manner; and to David Leake, who then shipped DVDs, data CDs, and soundtracks on behalf of GLPA to educators around the world, including Canada, Portugal, India, England, Korea, Japan, Australia, Denmark, New Zealand, Germany, Denmark, and Finland. Thanks, Dave.

It’s been a busy year. I wrote an article for *Physics Education* journal. To prepare the community for the transit, we took solar-filtered telescopes to school groups to observe active sunspots; we spoke at senior citizen gatherings; we had Girl Scouts design their own stained glass windows, with their own words celebrating the transit; and the local Girls & Boys Club created an exhibit of student artwork to commemorate the event.

Artwork—this being by a young student—had a central role in our celebrations. The Glance Eyewear Art Gallery hosted a month-long Transit of Venus Exhibit, with artists from several states contributing to the exhibit. This piece <http://www.transitofvenus.org/gallery/wali007.jpg> is by Wali Neal of the African American Museum in Cleveland. NASA shipped its exhibit, *The Sun as Art*, which featured images and captions from the SOHO spacecraft. It never ceases to amaze me how other people interpret astronomical events and portray them in artwork. In this image, Venus is depicted as the Mesoamerican god Quetzalcoatl. This piece was done by GLPA’s own Dayle Brown.

At the PHM Planetarium & Air/Space Museum, historic artifacts were displayed, including original photographs from US Naval Observatory expeditions, John Philip Sousa’s novel *The Transit of Venus*, and this Doppelmayer atlas that you may have seen in *Mercury* magazine.

Music played a major role as well in our celebrations. Here a Penn High School band rehearses John Philip Sousa’s *Transit of Venus March* in preparation for its Spring Concert.

When you correlate the ideal viewing zone with a map of the average cloud cover <http://sunearth.gsfc.nasa.gov/eclipse/transit/TV2004/TV2004-Weather1a.JPG>, it seems the best place to view the transit is in the Middle East. We sent nearly 4,000 “eclipse shades,” with help from Rainbow Symphony and the Third United States Army, to U.S. troops at about 20 sites in Iraq, Afghanistan, and Kuwait. Accompanying the shipments of “eclipse shades” were DVD/CD sets from GLPA and flyers explaining the significance of the transit and how to view it safely. The flyer was also translated into Arabic and Farsi.

The National Science Teachers Association (NSTA) national conference was another venue through which

we spread the word about the forthcoming transit. Here, at the CNN Tower in Atlanta, the transit was a topic at a roundtable discussion that included CNN anchorman Miles O'Brien and CNN science producer Peter Dykstra. Among the transit of Venus enthusiasts to visit our display area was Becky Lowder of the Georgia Southern University Planetarium, who received the 2004 Sky & Telescope Astronomy Day Award for their transit of Venus offerings. Nice job, Becky. Another transit of Venus supporter at the NSTA conference was April Whitt, our 2004 Spitz Lecturer. Thank you, April.

Perhaps Google's artists got our message asking them to recognize the transit. Their *Zeitgeist* feature ranks event popularity, and for June 2004 the transit of Venus was the 6th most popular news query. When you look at overall events for the month of June, 2004, the transit of Venus ranked as the single most popular event for the entire month. That boded well for our www.transitofvenus.org website, which took a bronze among other ToV websites from a Google search.

The www.transitofvenus.org website was probably the component that reached the most people. It consists of over 2,000 files, and on June 8th we had over 133,000 distinct visitors requesting over 6.8 million hits—when the counter failed. The counter remained down for days, to my dismay, so we won't know how many people ultimately visited.

Meanwhile, our other web pages (<http://analyzer.depaul.edu/paperplate/Transit%20of%20Venus/Introduction.htm>) at the Paper Plate Education website had over 66,000 distinct visitors on June 8th making over 400,000 hits. It, too, was ranked in the top ten on Google on June 8th, though it may have since slipped. You'll notice here's a photograph by GLPA's Rick Pirko.

One of the pleasures in preparing for the transit was visiting sites that had historic significance, such as the US Naval Observatory, shown here, and St. Michael Church in Hoole, England. In pawing through the collection of images archived at the US Naval Observatory Library, I came to appreciate the arduousness of the expeditions that set out to time previous transits. Look at the desolation of this site (<http://www.transitofvenus.org/usno-patagonia01405.jpg>), said to be in Patagonia. I wanted to experience what it was like to be in one of these tents. And I feel like I succeeded in that regard (<http://www.transitofvenus.org/usno-bird01421.jpg>). I have come away with a better understanding of the accomplishments of our predecessors.

Prior to the transit I wrote <<http://www.transitofvenus.org/jars-scopes.doc>>: "After the transit, I plan on raising a glass to well-known and nameless explorers alike who contributed to our understanding of the size of the solar system." This has been made easier by the Mishawaka Brewing Company's having crafted a *Transit of Venus*

Sunrise Ale. So, to honor those known and unknown alike, I invite you to join me in raising a bottle of Sunrise Ale. Save it, drink it—whatever. To quote beleaguered Alexandre-Gui Pingré, "*Liquor gives us the necessary strength for determining the distance of the Earth from the Sun.*"

I wish Art Klinger were here so I could thank him in the presence of you, his colleagues. Art was incredibly supportive of my personal ambitions as they related to the transit. I can't say enough about his active participation in spreading the word. Here we are out scouting sites for June 8th itself. Many thanks, Art.

Which brings us to the final twenty-four hours before the transit began. See <http://www.transitofvenus.org/june8.htm>. Actually, the final push began June 7th at a 6:00 a.m. television interview. Thus began a long workday. On Monday morning, June 7th, we began setting up our local observing site near the planetarium on school grounds. Here <http://www.transitofvenus.org/2004/dsc03095med.jpg>, a tent covers six monitors, which were used to show live webcasts, cable news broadcasts, the DVD, websites, a video projection from a hydrogen-alpha telescope on site, and more. We had cabling to send a live feed to the mobile TV units in attendance.

By day Monday, observers from out of town arrived and set up their scopes and gear. Here, Chicago GLPA member Roy Kaelin prepares his gear. In the background you can see the bucket I used on my scope for a rear screen projection. Signage and balloons from our sponsor, Jordan Toyota, added to the festivities. By evening, local observers and distant travelers alike set up tents in the adjacent field.

The Sun was expected to rise above the backstop in the distance. You'll notice we did not have a perfectly low horizon, so we had to wait for the Sun to clear the trees in the distance. As night settled in, the scope owners showed typical deep sky objects to visitors who had just seen the planetarium program. It was a nice, reasonably clear night of viewing that hinted at great things to come.

Near midnight, the die-hard observers—including some families—who hung around watched the beginning of the transit via NASA's webcast beamed from Greece.

As dawn neared on Tuesday morning, June 8th, a crowd soon materialized. Scopes were aimed at the waning Moon as we awaited sunrise. Here I'm hooked up to a wireless remote microphone, by which I narrated for the crowd. What's interesting to note is not that my commentary had any intrinsic appeal, but that the event was a hook that got people curious enough to check it out. Note the person staring down the tube into the reflecting mirror <http://www.transitofvenus.org/images/1g035.jpg>. That's where the real learning was taking place.

Media began showing up early, only to set up their antennae in the path of where the Sun would be sweeping across the sky—and in our telescopes' fields of view. Fortunately, they relocated to a distant corner of the site.

The excitement was building. Volunteers and families prepared for the imminent sunrise, their scopes at the ready. Let me tell you, the anticipation was palpable. I suddenly felt like I was not the lone astronomy geek who saw merit in observing this celestial event. People had come from Virginia, Michigan, Ohio, Illinois, and Indiana—just to witness the transit with us.

Among the observing equipment were a 4-inch and 6-inch Alvin Clark reflector; simple “eclipse shades”; rear projection screen devices; two hydrogen-alpha telescopes; about 15 solar-filtered telescopes; and some home-made contraptions.

Then, in the words of Jeremiah Horrocks, as memorialized in stained glass <<http://www.transitofvenus.org/hoole-window01644.jpg>>: “Behold, a most graceful [or agreeable] spectacle; and the realization of all my wishes.” I couldn't agree more. Boom. There it was, embedded in the Sun as it rose above the tree line—a most agreeable spectacle. Many people did have difficulty sighting Venus with just the “eclipse shades,” but we did have enough scopes for everyone.

This visitor was particularly observant and clever <http://www.transitofvenus.org/images/3g005.jpg>. He brought a lens from an old office copy machine. If it were a lens, surely it had to have a focal length. So he propped the lens up on a step ladder and stood back at the focal length to bring the image into clear focus. The ladder was, I believe, 34 feet away. It was brilliant. I never had considered the utility of such a simple lens.

Meanwhile, in a motor home parked behind the white tent, ham radio operator John Fleming had set up his equipment to broadcast the WWV time signal over our P.A. system. It was our intent to have students and the public time the third contact and submit the data to global observing projects.

Suddenly, a bank of low clouds materialized from beyond the tree line. Our third contact was in serious jeopardy. I trust this picture speaks volumes <http://www.transitofvenus.org/2004/dsc00016.jpg>. While I comforted myself by thinking that we at least still had webcasts to view, and that we had at least seen part of the transit, the sudden

impediment was undeniably frustrating. Nonetheless, we kept narrating a positive message while citing the woe of LeGentil. The clouds eventually cleared in time for third contact. While I don't know if this child ever saw anything, the picture suggests the level of enthusiasm among the crowd. It was a most rewarding community event <http://www.transitofvenus.org/june8.htm>.

So why is this man smiling?

- A.) He just witnessed a ToV
- B.) His summer vacation begins in 15 minutes
- C.) He has been experiencing a severe bout of back pain all night, and is now well medicated to alleviate the pain; or
- D.) all of the above

Here are what I deem to be our photographic contributions to the global collection of ToV images. Observers huddled around the rear projection bucket are reflected by the clear plastic lid cover <http://www.transitofvenus.org/2004/dsc00020.jpg>. In the background, we can hear the WWV time signal over the P.A., and the audience is quiet, with the exception of people whispering the cadence set by WWV. The moment of third contact nears.

There it is <http://www.transitofvenus.org/2004/dsc00022.jpg>. With my face leaning over for a closer look and my thumbs-up in the background to indicate the moment of contact, I could go back to the videotape and determine at what frame (and thus at what time) third contact occurred. This is what I consider my signature photo of the 2004 transit of Venus.

There are many people I'd like to thank in addition to the ones mentioned so far. Thank you, Sheldon Shafer, for inviting me to your facility. Don Tuttle was very kind in creating the quilt *Transit Time*. David Hurd enlightened us with his Trippensee planetarium demo. Sharon Shanks had kind words, and sent me paper plate models she used for a TV interview. Peggy Motes, who always immerses herself in exciting projects, hosted a major transit of Venus celebration. Gene Zajac shared the story of a wonderful personal experience of an observer who witnessed the transit. Roger Grossenbacher had more kind words. The folks at NASA Goddard Research Center—in particular, the Sun-Earth Connection Education Forum—were consistently supportive. The GLPA Executive Committee—the list goes on. Thank you, all. Again, the 2004 transit of Venus was a most rewarding experience.

Cheers.