

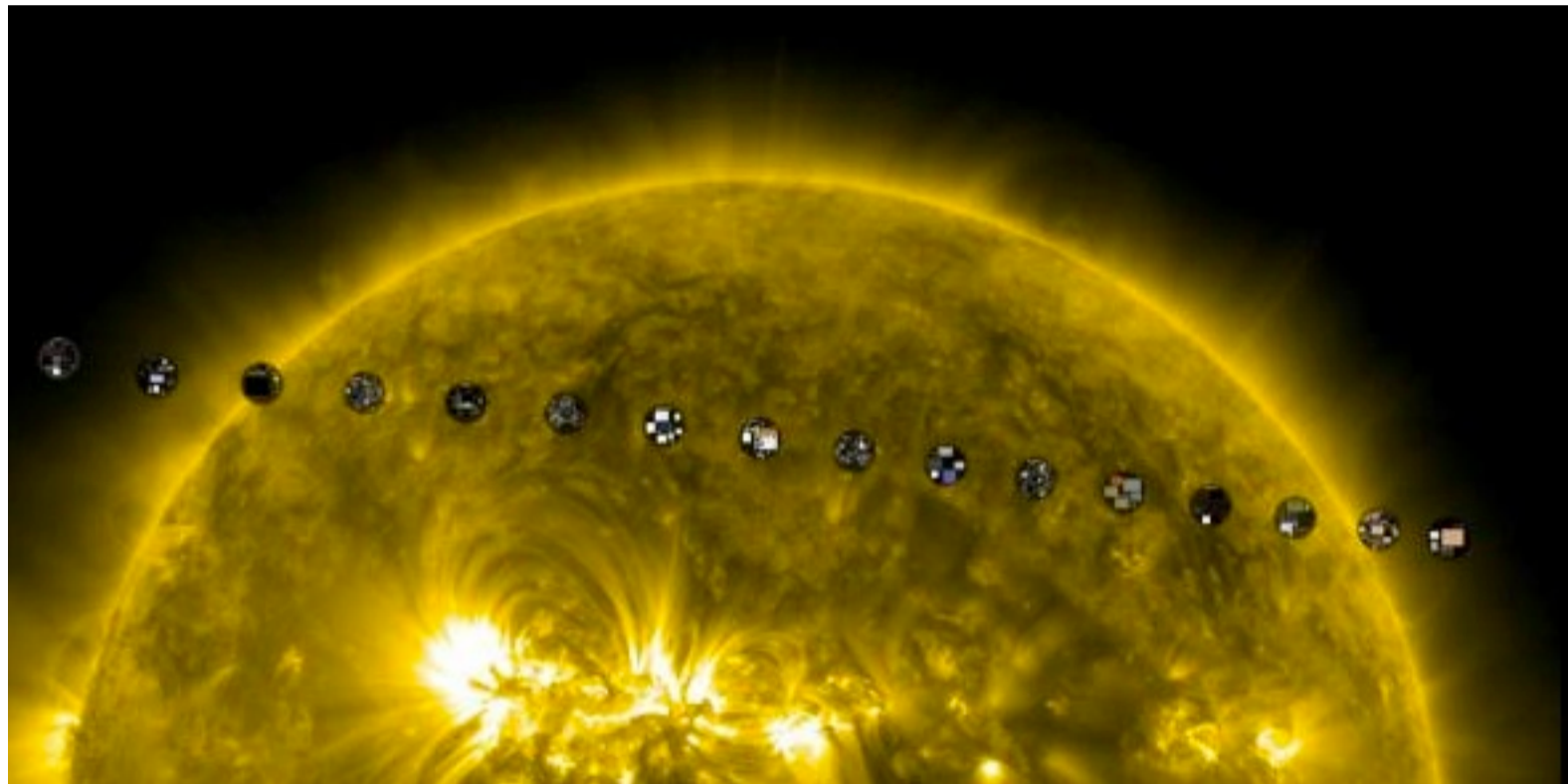
Community Celebrates



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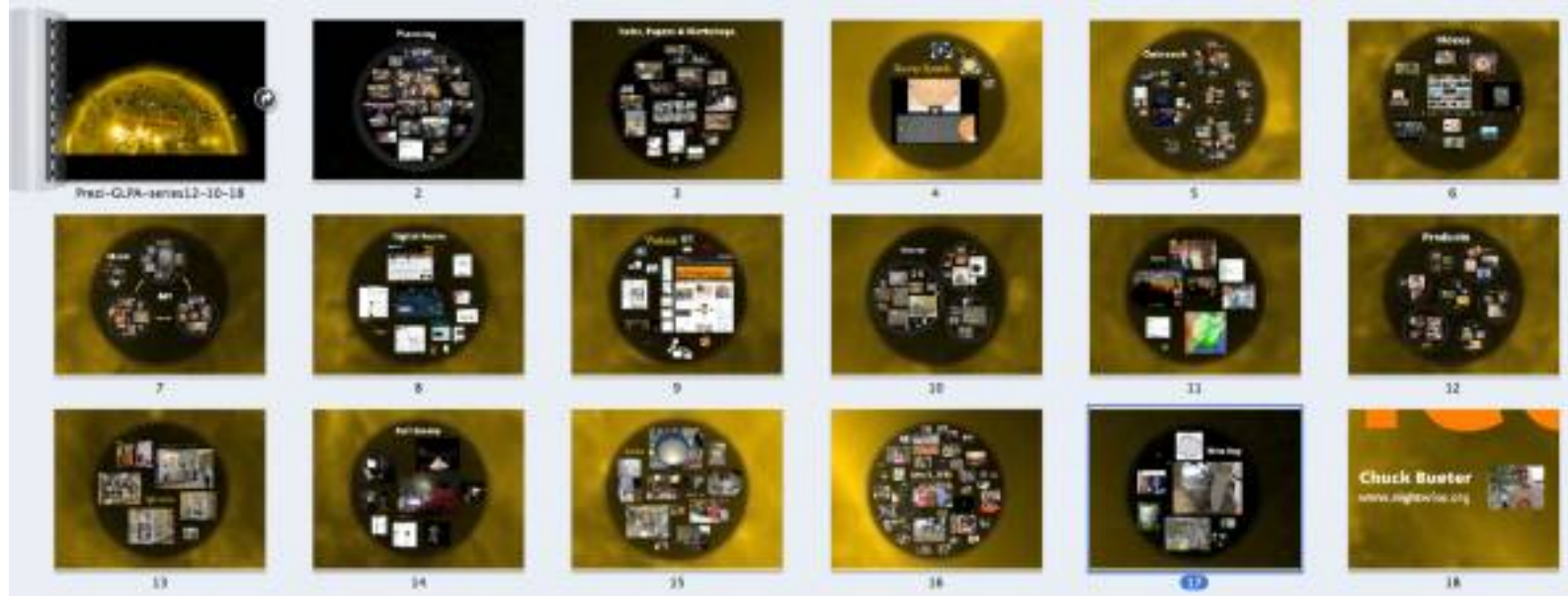
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Abstract:

Astronomy educators and enthusiasts near the Michigan-Indiana border embraced the 2012 Transit of Venus as a community celebration. Among the diverse components were a planetarium program, a treasure hunt, a lecture series, a symphony performance, a newsletter, a motor coach tour, original videos, art exhibits, historical displays, public outreach events, Sun Funnel workshops, social media initiatives, related products by small businesses, multiple observing opportunities, and a time capsule. This talk parallels the interactive prezi *Transit of Venus Across the Sun* at <http://prezi.com/3tgyibho9g-w/transit-of-venus-across-the-sun/>.

Text:

For the 2012 transit of Venus, a community of astronomy educators and enthusiasts near the Michigan-Indiana border (dubbed Michiana) embraced the 2012 Transit of Venus as a community celebration. Outreach efforts were diverse, extending into schools, businesses, institutions, and informal education venues. An interactive presentation *Transit of Venus Across the Sun* at <http://prezi.com/3tgyibho9g-w/transit-of-venus-across-the-sun/> has sixteen circles laden with images and embedded videos that suggest the extent of the community effort. Highlights of each black pearl on the string--each a talk unto itself--are summarized below. An audio file of the talk, delivered in the paper session at the Buhl Planetarium, is at <http://www.transitofvenus.org/docs/2012GLPA-Pittsburgh2.mp3>.



Planning

Diverse partners stepped up to plan and execute events before and during the transit of Venus. Among them were staff from planetariums, a math center, University of Notre Dame, a microbrewery, art galleries, astronomy clubs, NASA, and small businesses.

Talks, Papers & Workshops

Prior to June 2012, I presented papers and posters at the National Science Teacher's Association (NSTA) National Conference in Indianapolis; the Great Lakes Planetarium Association (GLPA) in Urbana, IL; the Astronomical Society of the Pacific (ASP) in Baltimore, MD; the American Astronomical Society (AAS) in Austin, TX; and the Michiana STEM Forum IV in South Bend, Indiana. Additional talks were at astronomy clubs, Rotary Clubs, and public venues in Ohio, Michigan, Illinois, Wisconsin, and Indiana. A sample is at <http://youtu.be/4bufgnyXw7c>. Publications included *Planetarian*, *Journal of the International Planetarium Society*, *Universe in the Classroom*, *The Classroom Astronomer*, and regular newsletters for the PHM Digital Video Theater.

Stump Speech

After the 1639 transit of Venus, Jeremiah Horrocks complained about two things. First, he didn't have enough time to warn others about the impending alignment. Second, he had to compete with sports. Of his friends, Horrocks wrote, "Most of them care little for trifles of this kind, preferring rather their hawks and their hounds."

Today science educators are still competing with the equivalent of hawks and hounds. If we as a nation want to prosper through math and science, then we need to celebrate math and science in action. Embrace it with the same zeal as sports and other popular culture. The transit of Venus is that opportunity to celebrate.

Outreach

The Michiana community stepped up to prepare students and the public alike for the transit of Venus. Venues included libraries, planetariums, a community math center, and parks. Activities occurred at Science Alive, a family event at the main library in South Bend; Prairie Vista University, a five-session after-school program at an elementary school; AstroFest, a school district event that was duplicated at South Bend Union Station; AstroCamp, a week-long summer camp for kids; and the Michiana Star Party.

To broaden our reach into the community and to involve individual business, the Riverbend Community Math Center coordinated a regional treasure hunt for families, called TROVE Adventure. About two dozen small businesses and institutions each exhibited a historical artifact with signage describing the respective item. Families who picked up ten Keywords from among the sites received free solar shades as a reward.

Videos

A collection of transit-specific videos are at <http://www.youtube.com/user/transitvenus>, a dozen of which originated in Michiana. While some are simple, others are more involved. Some are instructional, others are for fun. Topics included a performance of John Philip Sousa's Transit of Venus March; tapping of Venusian ale at a local microbrewery; mixing a cosmic cocktail; simulating the black drop effect with pinched fingers; and an animation of the transit of Venus as observed from Region X near the Arctic Circle. A local high school student conveyed the pattern of transits of Venus using paper plates, with the video (<http://youtu.be/lbsMAuy1Y>) receiving over 10,000 hits. The trailer for *The Transit of Venus* full-dome video garnered over 125,000 visitors.

Art & Music

Three art exhibits featured the transit of Venus and exoplanets. Art students at Penn High School displayed their works in the Kingsmen Art Gallery in Mishawaka, IN. The Northern Indiana Pastel Society sponsored an exhibit at the Harris Branch Library in Granger, IN. The third art show was in a mezzanine gallery at The Livery in Benton Harbor, MI. Samples from each exhibit are within the Prezi *Transit of Venus Across the Sun* at <http://prezi.com/3tgyibho9g-w/transit-of-venus-across-the-sun/>.

The Penn High School Symphonic Winds Band practiced for and performed John Philip Sousa's Transit of Venus March at its 2012 Spring Concert.

Digital Realm

The internet was a new tool for the 21st century transits of Venus, and I tapped into several new media outlets with different degrees of commitment. A particular source of enjoyment was writing entries for Steven van Roode's Transit of Venus blog at

<http://transitofvenus.nl/wp/>. I administered the Transit of Venus Group on Facebook (<http://www.facebook.com/groups/108400462513165/>), which nearly 2,000 people joined. Twitter, Quora, Flickr, Second Life, Prezi and local blogs were in the mix, but my commitment to maintaining them languished because of the demands on time that they require.

Website

A significant part of my personal commitment to the transit of Venus was developing the website www.transitofvenus.org. It originated as a collection of links to relevant content, to which I added my own material. A priority was to promote proper solar viewing so that more people could experience the transit of Venus safely. Indeed, as June 5 approached, in one snapshot about 23% of website traffic went to the Eye Safety page.

For eight years the website had been made possible by the generous support of Patrick Rumley of Vorakyal Group LLC (<http://vorakyalgroup.com>). The anticipated visitors would require significant bandwidth, and a huge spike in traffic could incur a large financial burden. I did not want the site to crash on June 5 if it reached a predetermined

limit. As a precaution, at the end of May 2012 I transferred the website's hosting to Slooh, which carried the load with the requirement that the site have ads to offset the expense.

Months before the transit, the website was receiving a few hundred visitors per day. As June opened, the daily numbers were up to tens of thousands. On June 5 and 6, over 1.2 million people visited, averaging 1.8 pages per visit and an average visit duration of one minute and forty five seconds. Eighty five percent were new visits.

History

A main appeal of the transit of Venus is its history. The US Naval Observatory Library supported our efforts by shipping a variety of documents, images, and journals from 19th century USNO expeditions. These artifacts were distributed among library displays and the TROVE Adventure treasure hunt when they could be safely displayed.

Of particular interest were items from the 1874 and 1882 ventures to Kerguelen Island and Patagonia, respectively, for a resident of Indiana, Irvin Stanley, served as Assistant Photographer for both USNO expeditions.

On June 5, Irvin family members from several states met in Indiana. Traveling by motor coach, they visited all three exhibits, heard my presentation about Irvin Stanley and his contemporaries, given under the PHM digital planetarium dome; saw the transit of Venus out of a telescope given to University of Notre Dame by Napoleon III; saw the transit of Venus from Warren Dunes State Park with the sun setting over Lake Michigan; and concluded the night at The Livery microbrewery.

The USNO artifacts included Stanley's travel records and pay statements. An interesting discovery from the USNO expedition to Kerguelen was the finding of a telescope mask hand drawn on two-sided paper. After all their preparations on the grounds of the US Naval Observatory, there were still some last minute modifications to the equipment setup.

During an elevator ride in Mexico, I and a hotel employee decided to track down the plaque commemorating Chappe de Auteroch and his 1769 team in nearby San Jose del Cabo. Though the plaque, installed in 1974 was known to exist, I had not seen any pictures of it and its whereabouts were unknown. Our efforts were not without incident, as we ended up detained in a Mexican police station awhile with the car impounded. Later we found the plaque in the town's cultural center and realized why it had gone unnoticed--the plaque is always covered when the sliding wood door in the facility is open.

NASA

NASA was a valuable and supportive partner. Elaine Lewis of Goddard Space Flight Center did not hesitate to pick up the torch and lead the Venus Transit Partners, a collaboration of individuals and institutions who met by teleconference monthly to coordinate national and global planning of transit of Venus events.

Dr. Steven Williams, Chief of Education Initiatives at the National Air and Space Museum who was on detail assignment to NASA HQ, visited the Michiana community for three days. He packed his itinerary with visits to schools, presented a public lecture at the PHM Digital Video Theater, attended and presented another talk at the Michiana Star Party, and met with leaders of the community's astronomy education and public outreach efforts.

Astronaut Don Pettit had prepared to take photographs of the transit from his perch in the cupola of the International Space Station. In his normal efficient, can-do, and acronym-laden manner, former planetarian Rob Landis was supportive in sharing the preparations by Pettit and his earth-bound colleague Mario Runco, Jr., with insight into things like removing the windows' scratch panes, winnowing files for download, and taking sample frames.

NASA's Solar Dynamics Observatory was expected to be the premiere satellite imaging the sun on June 5-6, and it delivered gorgeous results. The background image of the prezi is credited to SDO. Shortly after SDO had been launched, I wrote the SDO team to inquire whether the satellite would be well positioned to see the transit. Rather than merely state yes or no, they kindly replied with a nice video simulation (<http://youtu.be/4QtZFKDpemY>).

The Sun-Earth Day team at GSFC supported our outreach efforts with teacher packets and their own interactive website. I was fortunate to join NASA's transit of Venus panel at the IDEA Project Capstone Event at the National Science Teacher Association Annual Meeting, and later partner with NASA's Troy Cline at an NSTA paper session.

Products

I solicited some local businesses to participate in the global celestial event, and those who accepted the invitation did so enthusiastically. Among the commercial ventures were Venusian ale, a Transit of Venus salad, a Cosmic Cocktail garnished with a whole lime slice with a caper, T-shirts, and Black Drop Effect Coffee. One business with a convenient name, Pizza Transit, created two new pizzas, including one with black olives strung across in a chord. Not everyone saw the commercial foray as an honest effort to boost the economy and promote science concurrently in a fun way. One major US newspaper portrayed it as science hucksterism, which did not set well with my two kids, who have seen the intent of all these efforts.

Exhibits

Two libraries hosted displays of historical artifacts and general transit of Venus information. While I prepared two exhibits for the Harris Branch Library, the astrophysics outreach team at University of Notre Dame created three displays at the Hesburgh Library. Both of these were opportunities to showcase USNO artifacts and the role of Irvin Stanley of Indiana.

Full Dome Video

I and GLPA member Patrick McPike partnered to produce a 4-minute full-dome video that digital theaters could play as a trailer--not a trailer to an upcoming show but to the upcoming celestial event. On short notice, McPike delivered quality animation and visual effects. Grass Roots Media donated recording and editing resources, and the New Zealand band named *Transit of Venus* provided the soundtrack. An early draft of McPike's handiwork went online at <http://youtu.be/ehHY9fTrb7Q>, where it was viewed by over 125,000 people. NASA hosted the dome master files online for planetarium manufacturers, user groups, and individuals to download and slice for their respective systems. Digital venues could then show the full-dome video at no cost.

Sun Funnel

The sun funnel is a device that fits into a telescope focuser and allows a group of observers to see safely a rear-projected image of the sun. While GLPA member Gene Zajac and I had developed a similar unit for the 2004 transit of Venus, the instructions received a significant upgrade at the hands of Rick Fienberg, Education & Outreach Coordinator for the American Astronomical Society. See http://www.transitofvenus.org/docs/Build_a_Sun_Funnel.pdf.

I co-hosted a few workshops to build the units at ASP and GLPA conferences and at Yerkes Observatory. The Sun Funnel was a surprising hit with many users. After the transit I read or heard many unsolicited yet favorable comments about the image quality, not only of the transiting planet but of the sunspots as well.

June 5, 2012

Ahhh, the big day. Our community had been planning for a solar spectacle for months, and Tuesday morning began with favorable conditions. A recommended summary of my day is posted in a blog entry *Viewing Great, Timing Difficult* at <http://transitofvenus.nl/wp/2012/06/18/viewing-great-timing-difficult/>. A film crew that had been documenting the couple of days preceding the transit also published a video at <https://vimeo.com/49916552>.

About 6,000 solar shades had been distributed around town, and clear skies brought out curious observers. Telescopes were set up outside the PHM Digital Video Theater; at Notre Dame; at LaSalle Intermediate Academy; at New Carlisle Public Library; at Andrews University; and at Warren Dunes State Park. These formal observing sites around town tallied crowds that totaled nearly 5,000 people.

June 5 was a hectic but rewarding day. The transit was visible outside the PHM Digital Video Theater and later along the lakefront at Warren Dunes State Park. After the sun set, some people adjourned to The Livery microbrewery in Benton Harbor, MI. It had been the site of one of three transit of Venus art exhibits and had crafted the Venusian ale. There I participated in Slooh's Google+ Hangout, where I giddily showed the art exhibit and time keg and recalled the day's successes.

Fifteen minutes before midnight the bar patrons emptied into the outdoor patio, everyone looked skyward, and right on schedule the International Space Station--with astronaut Don Pettit onboard--slowly glided overhead.

Time Keg

A poster about the Transit of Venus Time Keg is displayed at the GLPA 2012 Annual Conference in Pittsburgh. The time capsule (<http://www.transitofvenus.org/misc/360-transit-of-venus-time-keg>) is intended to be opened after 100 years as the 2117 and 2125 transits of Venus approach. It was set up on June 5 for witnesses to leave comments for future observers, with additional material added through the October conference, at which it was sealed. For the immediate future it will be stored and displayed at the Air & Space Museum within the PHM Digital Video Theater.

A few blog posts note that I had solicited input from the 2012 presidential candidates and other leaders on the role of science in America's future and the value of observing nature in motion, such as during a transit of Venus. Indiana Governor Mitch Daniels replied with a sealed letter, not to be opened for at least a century.

Closure

When June 5 passed, I walked away from the transit of Venus whirlwind. Our community's outreach efforts had been a consuming run, and my family was ready for my return from the monomaniacal pursuit. Nonetheless, the celebration of math and science in action was personally rewarding and--obscure as a transit of Venus may be--hopefully contributed to the prospering of our community and nation. It was a fun run. I thank my wife Mary, kids Eric and Sarah, and all of the community supporters who made it possible.