# At the Shadow's Edge: A Great North American Eclipse Report from Louisville


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# U. LOUISVILLE AND ECLIPSE AMBASSADORS

Outreach efforts at U. Louisville (23,000 students) were done by astronomy faculty and students. Preparations began 1.5 years in advance with a proposal for a 1 credit eclipse course (Williger & Birriel, Poster 205.22), taken by 114 students over 2 semesters at UL; a small run of eclipse t-shirts was printed. U. Louisville issued a press release (https://www.uoflnews.com/post/uofltoday/uofl-professor-offering-class-ahead-of-april-8-2024-eclipse/) to advertise the course. The University President was informed of the eclipse a year in advance with a request for any possible support. G. Williger and B. Smith joined and trained with the Astron. Soc. of the Pacific (ASP) NASA Partner Eclipse Ambassador program. Through it, they gave 8 presentations pre-eclipse to a total of >200 people, beginning at Astronomy on Tap on Sep 6. Other presentations were at a Staff Senate meeting (9/12), a public University lecture (10/5), at the Scobee Center for the annular eclipse in San Antonio (10/14), the Jesuit U. of Guadalajara, Mexico (10/26), the Archdiocese of Louisville Gold Mass for Scientists (11/27), the University Club for alumni (2/16) and for Mortar Board Nat'l Senior Honorary (3/28). Smith was the Society of Physics Students (SPS) Outreach Coordinator, and passed out 200 eclipse glasses provided by the Eclipse Ambassador program.

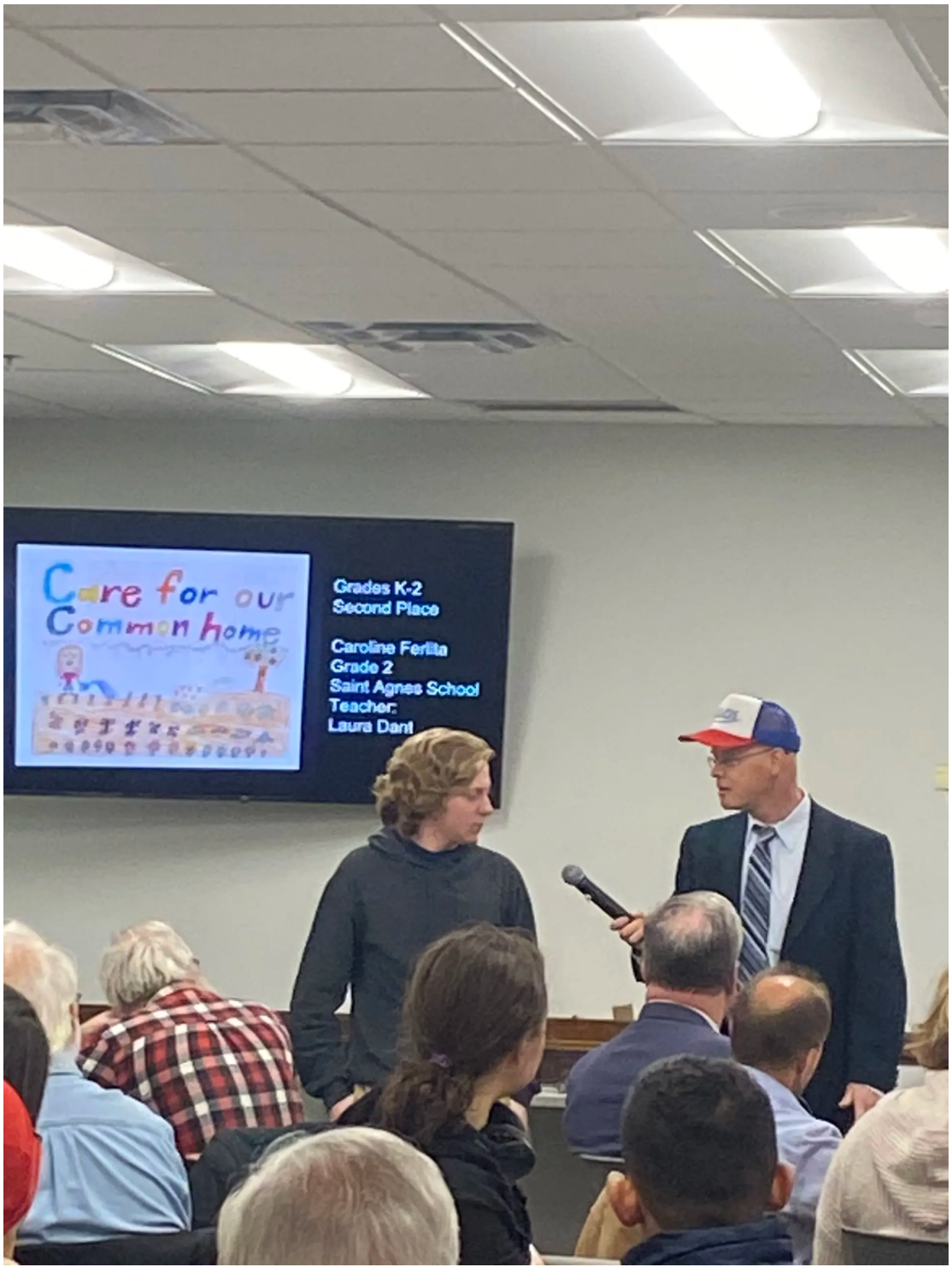


Photo: Smith (L) and Williger (R) presenting at the Archdiocese of Louisville Gold Mass, Holy Family Parish, Nov 27, 2023. Credit: Elmedina Brkic

On Eclipse Day, officially classes were held as normal, though some faculty cancelled/postponed classes or put them online. Smith helped to lead an SPS expedition of 11 members and 4 non-members to Bloomington, IN, accompanied by faculty advisor James Lauroesch. Funding for the SPS trip was requested from the UL student club/organization programming committee, but not granted. Funds in normal circumstances are granted only for events on-campus which are accessible to all students. No astronomy students/faculty wanted to stay behind and miss totality.

Photo: SPS at an eclipse watch in Bloomington IN, Apr 8, 2024. Credit: James Lauroesch

There were an estimated 200,000-300,000 visitors to Bloomington for the event, including a speech by William Shatner timed to start totality. Faculty member Benne Holwerda spoke at an alumni/donor eclipse event near Columbus IN. A number of students went to totality, on their own, as well. Williger gave a presentation to ~25 people at a park in Odon IN. One dean made a special announcement to permit students, faculty and staff to see the eclipse, the acting Dean of Public Health, W. Paul McKinney. He was in the UL eclipse class, and also bought and distributed 800 sets of eclipse glasses to members of his unit. (UL has ~20,000 students and several thousand more faculty/staff.) In addition, he, Williger and Dr. Patrick Scott, MD, wrote an op-ed in the Courier-Journal (https://www.courier-journal.com/story/opinion/2024/04/06/louisville-historic-solar-eclipse-safely-view/73180214007/) discussing eclipse eye safety.

U. Louisville runs the 160-seat Rauch Planetarium, the largest operating one in 2020 for a radius of 200 miles. It was closed for COVID in early 2020, and never re-opened to the public, though it was used for University astronomy classes. The Evansville and Indianapolis (Butler U) planetariums did significant eclipse outreach, and illustrate the usefulness of such facilities. Rauch Planetarium remains closed to date, though there are discussions to re-open it if funding becomes available.

# OTHER UNIVERSITIES AND LOCAL SCHOOLS

OTHER UNIVERSITIES: In Louisville, Spalding U (1500 students) was closed, bought 15 eclipse glasses for students and staff, and held a campus-wide watch party to near downtown Louisville. Sullivan U (2700 students) went to the event (https://www.facebook.com/SullivanUniversity/posts/419339340799898/)at Waterfront Park. Indiana U-Southeast (5200 students) was also closed, as part of the entire IU system, and distributed some eclipse glasses (https://today.iu.edu/live/news/4520-get-solar-eclipse-glasses-ahead-of-april-8). All other area universities were open. At Bellarmine U (4000 students), there was an eclipse watch run by Physics Prof. Akhtar Mahmood. Some astronomy students went to totality.

SCHOOLS: In Louisville Metro, local public schools were closed, officially for teacher development (though those with enough development hours were exempt) and as an extension of spring break. There was in general no centrally planned instruction from district superindendents or principals, as they were often taken up with their normal duties or had not been on the job during the 2017 eclipse, but some individual teachers planned lessons and even distributed eclipse glasses for students and their families. Catholic Archdiocese of Louisville schools were also closed as an extension of spring break. According to the Louisville Courier-Journal, (https://www.courier-journal.com/story/life/2024/03/11/2024-solar-eclipse-which-kentucky-schools-will-be-closed/72879798007/) in Kentucky, Bullitt, Oldham, Spencer and Trimble County schools were closed, though the last three had some staff/teacher obligations or development days. In Indiana, Clarksville, Clark and Harrison County schools were closed, Floyd County had e-learning, and Washington County closed at noon for the 3pm eclipse and anticipated traffic jams.

HIGH SCHOOL EXAMPLE: Dan Hawboldt teaches physics at Oldham County South HS. He was the only teacher to take the U Louisville eclipse course, which he did in autumn 2023 (poster 205.22). He taught an astronomy class of 28 students with detailed eclipse material, and added eclipse material for physics classes with 90 and a research class with 15 students each. He also gave links for people to find eclipse glasses, and taught a fellow physics teacher how to make a successful pinhole camera.

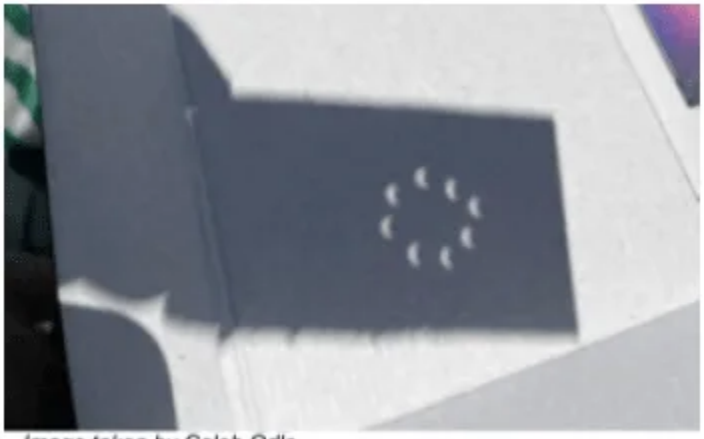

*Image taken by Caleb Odle*

Photo: Crescents using pinhole camera built by Oldham County HS physics teacher Caleb Odle, with construction taught by fellow teacher Dan Hawboldt.

MIDDLE SCHOOL EXAMPLE: Jill Lauroesch teaches 6-8th grade special education at Meyzeek Middle School in Jefferson County Public Scools (JCPS). She devoted lessons to the eclipse and they prepared a poster about eclipses. She also handed out eclipse glasses which were provided by a volunteer at the school for students and their families and discussed safe viewing of the eclipse.

ELEMBNTARY SCHOOL EXAMPLE: Vicki Bryan teaches 5th-6th grade science at Our Lady of Lourdes Catholic School. She applied for and was accepted to the Eclipse Ambassador program run by the National Science Teacher Association (NSTA). After doing training, she committed to eclipse outreach, and in combination with teaching in her school, directly presented to >200 people, including via Girl Scout troops and Nazareth (retirement) Home. She also did an interview with WDRB-TV (https://www.wdrb.com/weather/wdrb-weather-blog/not-sure-what-to-do-with-your-students-on-eclipse-day-take-a-trip-inside/article_643539fa-e764-11ee-bf65-7361fc61cdaf.html) and with The Record (https://therecordnewspaper.org/eclipse-set-to-occur-april-8/), the Diocesian newspaper. **A key goal was to have her students teach their parents and others about the eclipse, which was successful.** Her slide set for students also was viewed by parents and others. In 2017, she only saw the partial eclipse from Louisville (95%).


Photo: Vicki Bryan in her classroom teaching about eclipses, Feb. 15, 2024. Fifth-graders Leah Holland, Emmy Korfhage and Aaron Huff, from left, assisted. (*The Record*, Photo by Ruby Thomas)

In 2024, she went to Columbus IN for totality, and her emotion is clear in her 30" video.

[VIDEO] https://res.cloudinary.com/amuze-interactive/video/upload/q_auto/v1736735549/aas/C1-FD-57-20-FC-15-10-42-AD-AB-2B-33-E3-07-49-F5/Video/video_bryan_vicki_20240408_po11qp.mp4
Video: 30" video by Vicki Bryan at Seymour IN, Apr 8, 2024.

# FALLS OF THE OHIO STATE PARK (INDIANA)

At Falls of the Ohio State Park in Clarksville IN, Greg Miller and Steve Katsikas (both of Louisville Astronomical Society) gave an eclipse talk on Dec. 9, 2023 at 2pm, in preparation for the event. They described how to use an application written by Miller to determine the totality path and duration for given places on a map.

Naturalist Alan Goldstein provided the following information. At Falls of the Ohio, there was an eclipse watch set up with a full afternoon program from noon until 4:22pm (the end of the 99.3% partial eclipse). Michael Harris of the Louisville Astronomical Society assisted local staff. The event started with "Eclipse Art at the Falls" (30 people), then had a presentation on the eclipse, including the decoration of eclipse glasses for children. There was also programming about birds and the darkening of the sky run by Colleen and Tom Becker, two local experts (16 people). The River Room was set up to watch totality from other locations by TV (15 people). There was another session about the Eclipse Under the Trees, which showed shadow phenomena (14 people). Other contributing Falls of the Ohio staff included Morgan Apple, Joanne Ballard, Nick Feltner, Jane Archer, Jessica Castro Brightman and Bob Thesier. There were 226 visitor contacts.


Photo: Falls of the Ohio State Park, decorating eclipse glasses with Mike Gibson, Apr 8, 2024. Source: Falls of the Ohio State Park

Also on Eclipse Day, Falls of the Ohio Naturalist Alan Goldstein, who is an experienced amateur astronomer and frequent contributor to Astronomy Magazine, was at Brown County State Park, which experienced totality. The Indana Dept. of Natural Resources (DNR) distributed telescopes and solar filters to the state parks system. However, few DNR Staff were experienced with telescopes, so he was asked to assist in the path of totality itself.

# KY SCIENCE CENTER

The Kentucky Science Center (KSC), the largest hands-on science museum in the Commonwealth, hosted an event on Eclipse Day funded by NASA. Virginia Hoyt, Manager of Programs and Partner Engagement, provided the following material. They distributed eclipse viewing glasses with admission, had indoor and outdoor eclipse-based programming, and received an outreach donation of pinhole punch viewers to distribute on Main Street. WLKY-TV and LPM (the NPR station) did coverage of the event throughout the day. About 400 guests came, and there was additional outdoor engagement on Main Street as well. During the eclipse, about 200 people joined at the front of their building to safely view the eclipse.

**Indoor program events** were:

-Storytime: Roaring Rockets interactive story with Alka Seltzer rocket design and experimentation

-Live NASA eclipse coverage in their Ecosphere and Discovery Galleries

-Make your own space medallion, in which people chose commemorative medallions and tried to recreate their own versions, or create their own

-Make your own planetary keychain ($5), where participants entered a significant date and laser-cut planetary positions at that time.

-Pinhole Camera Making, in which people created their own pinhole viewer for safe viewing of the eclipse.

-Forces show: explore forces like gravity during this demonstration

-Moon craters: create craters and explore how the surface of a planet or moon can tell us more

-Vacuum chamber: explore the vacuum of space by seeing the concept in action through a vacuum chamber activity.

-Pocket Universe, in which people created own very small scale solar system

-UV beads and Light Filtered: explore the properties of light waves

**Outdoor Programs** were:

-Light and shadow exploration: they facilitated exploration of the effects of the eclipse on light and shadows with everyday objects

Photo: Children make pinhole projections of the partially eclipsed sun in front of the Kentucky Science Center, Louisville KY, Apr 8, 2024. Source: Virginia Hoyt, KSC

-Constellation creation: peg board and loom band activity to learn more about constellations, in which people tried to recreate them, or created their own constellation

-Eclipse Art: recreate the eclipse using stencils and chalk on collaborative boards

-Pinhole Punch Cards: distribution and facilitation of this fun eclipse shadow tool

**Off-Site KSC Eclipse Experience 2024:**

The KSC partnered with the Evansville Museum of History and Science to transport 3 busloads of visitors (150 people) to totality on Eclipse Day. The KSC group combined with the Owensboro Science Center and Adventure Science Center from Nashville to gather in Evansville.

The Evansville Museum hosts offered a variety of hands-on activities from eclipse artistic expressions, telescope and pinhole camera viewing by local astronomers as well as several speaker sessions in their planetarium explaining the science behind how eclipses occur.

Speakers were on board each of the three buses, focusing on a variety of topics related to space and research. Guests got 3 minutes of totality in were able to experience 3.1 memorable minutes of totality.

# LOUISVILLE METRO ACTIVITIES, TOURISM AND MEDIA

ADVANCE PLANNING: The Mayor of Louisville was informed of the event a year in advance, with his office directing further enquiries to the head of Louisvllle Tourism (gotolouisville.com (https://www.gotolouisville.com)), who hosted an information meeting with U. Louisville astronomy faculty. A major topic was that Louisville was not in totality, missing by 35 miles with a 99.3% partial eclipse.

ACTIVITIES: In the community, various organizations and businesses gave out eclipse glasses, including by Eclipse Bank (https://www.whas11.com/article/features/great-day-live/eclipse-bank-discusses-their-solar-eclipse-glasses-giveaway-community-involvement/417-42f07f43-04ce-444f-b5bb-cb7164b90300), named after a baseball team possibly named (https://www.wave3.com/2024/04/05/louisvilles-storied-history-with-eclipses-began-baseball-field/)for the 1869 eclipse in the area.

On Eclipse Day, the main activities were at city parks. There were three local public watch events, (https://www.courier-journal.com/story/opinion/2024/04/06/louisville-historic-solar-eclipse-safely-view/73180214007/) at the Kentucky Science Center, at Iroquois Park (partnered with the Olmsted Parks Conservancy non-profit), at Waterfront Park at the Big Four Bridge (with >2000 eclipse glasses distributed by the Kentuckiana Regional Planning & Development Agency, see article and photos (https://www.courier-journal.com/story/news/2024/04/08/2024-solar-eclipse-crowds-enjoy-april-8-eclipse-in-louisville/73249909007/), and at Silver Street Park in New Albany IN.

Photo: A family viewing the partial eclipse at Iroquois Park, Louisville, April 8, 2024. Source: Jon Reiter, Louisville Parks & Recreation

MEDIA COVERAGE: The Louisville area includes parts of southern Indiana which had totality. There were many pieces in the local press and on radio/TV, both by meteorologists and by journalists/reporters, including reports near and from totality on Eclipse Day. We link to a few representative examples of advance and on-the-spot coverage here.

Indiana Prepares for Eclipse, WDRB-TV (https://www.wdrb.com/news/indiana-dnr-preparing-for-total-solar-eclipse-in-april-2024/article_c13d5740-24d7-11ee-a474-cb7063b0bad1.html), 17 Jul 2023

U. Louisville's Eclipse Class, Louisville Public Media (https://www.lpm.org/news/2023-12-31/uofls-total-solar-eclipse-class-will-explore-historical-cultural-impact-of-the-phenomenon), 31 Dec 2023

How to Safely Watch the Event, WHAS-TV (https://www.whas11.com/article/news/world/solar-eclipse/total-solar-eclipse-2024-how-to-safely-watch/417-91783da1-b279-4568-ba17-83fffe9ca0ca), 29 Feb 2024

The Great American Eclipse  WAVE Country, WAVE3-TV (https://www.wave3.com/2024/03/08/great-american-eclipse-wave-country/), 8 Mar 2024

New Tool to Calculate Eclipse Coverage, WLKY-TV (https://www.wlky.com/article/louisville-eclipse-path-of-totality-tool-how-close/60190712), 13 Mar 2024

3 Eclipse Watches in Louisville Area, Louisville Courier-Journal (https://www.courier-journal.com/story/opinion/2024/04/06/louisville-historic-solar-eclipse-safely-view/73180214007/), 18 Mar 2024

Dr. Rachel Connolly Details the Eclipse, WHAS 850AM Radio (https://www.iheart.com/podcast/66-terry-meiners-28199905/episode/dr-rachel-connolly-details-the-upcoming-160738274/), 20 Mar 2024 ; ( the former Director of the Louisville Planetarium c. 2006-09)

Effect of the Eclipse on Weather, WAVE3-TV (https://www.wave3.com/2024/04/05/behind-forecast-total-solar-eclipses-impact-our-weather/), 5 Apr 2024

Eclipse from French Lick IN, WHAS-TV (https://www.whas11.com/article/news/world/solar-eclipse/live-2024-total-solar-eclipse-coverage-french-lick-indiana-path-of-totality/417-d245fc63-a0f7-4df8-a316-23a109a27239), 8 Apr 2024

Eclipse from French Lick, Scottsburg, Holiday World IN, WLKY-TV, (https://www.wlky.com/article/live-updates-total-solar-eclipse-kentucky-indiana/60428197) 8 Apr 2024

U Louisvllle Students See Eclipse, 8 Apr 2024, U Louisville Cardinal online student newspaper (https://www.louisvillecardinal.com/2024/04/gallery-where-were-you-during-the-2024-solar-eclipse/)

Photo: Louisville Mayor Craig Greenberg views the partial eclipse from Waterfront Park, Apr 8, 2024. Credit: Scott Utterback/Courier Journal

TOURISM DATA/ECONOMIC IMPACT: According to the Louisville Courier-Journal in 2022 (https://www.courier-journal.com/story/news/local/2022/12/28/louisville-tourism-wants-more-hotels-heres-why-updates-4-projects/69654246007/), there were 21,744 hotel rooms in the area. According to Rosanne Mastin of Louisville Tourism, local hotel occupancy in Louisville was 55.5% of capacity on Apr 7, 2024. Compared to 2023, this is part of an increase of 74% and 78% on Apr 6 and 7, 2024. The total monthly occupancy for Apr 2024 was 357,000 (65% occupancy), compared to 341,000 for Apr 2023. Assuming 2 people/room, this translates to about 10,000 extra visitors each of the two nights before the eclipse. It is difficult to isolate numbers for the ecilpse vs. other events, but it was most likely at least partly responsible for the increase. If each person spent $200/day, that would be ~$4M revenue for the area.

According to KFVS-12 TV (https://www.kfvs12.com/2024/02/06/total-solar-eclipse-bring-more-visitors-traffic-ky/) (Cape Girardeau MO), there was an estimate of 1M people expected to drive through KY for the eclipse. Some fraction of them should have stopped in Louisville for 1-3 days before, as it contains two of the three Interstate routes to totality from Kentucky to Indiana. This was with no special events planned for visitors. If there had been a campaign to attract visitors to spend 1-2 days in Louisville before the eclipse, the numbers would likely have been even higher.

TRAFFIC: The biggest traffic jams, as expected, were on I-65 southbound and I-64 eastbound, leading from totality back to the Ohio River and the state line into Kentucky.

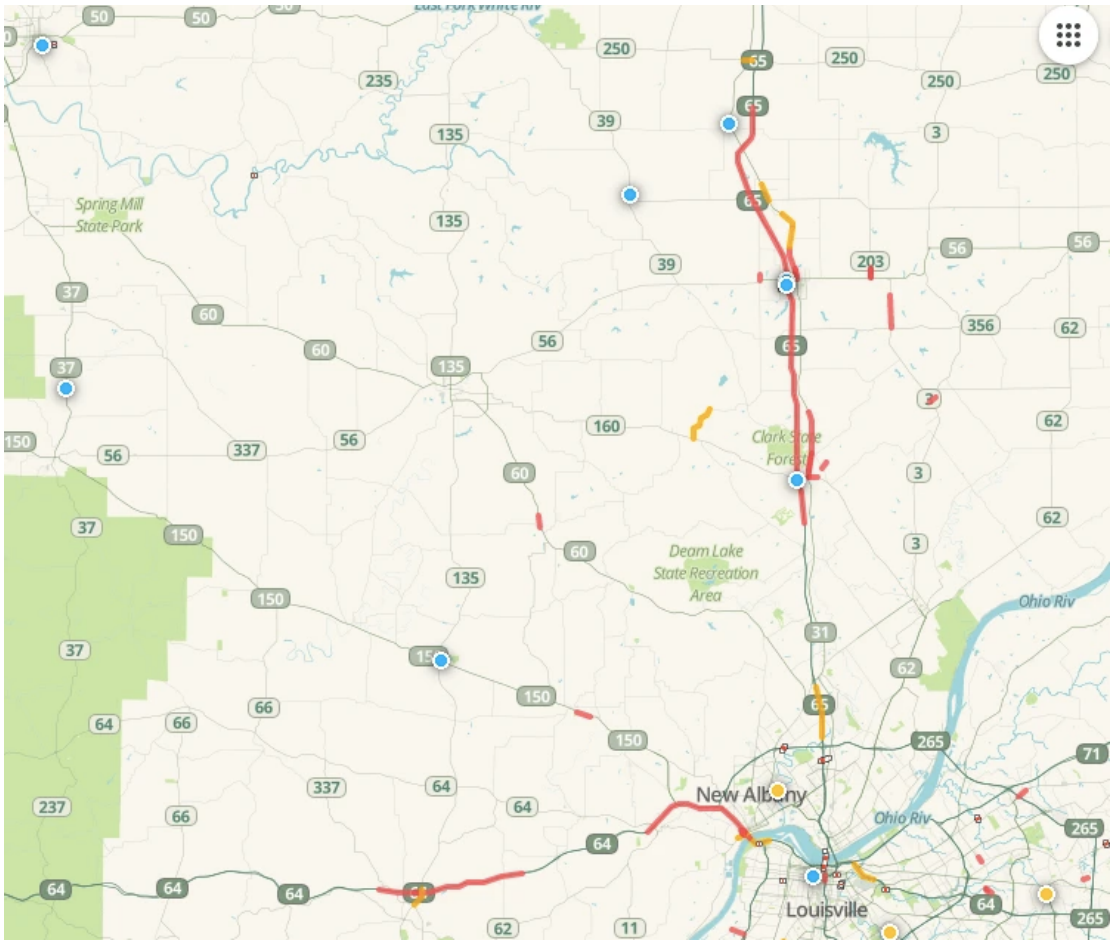


Photo: Traffic at 7:07pm EDT on Apr 8, 2024, 3.5 hours after totality. Jams are on I-65 southbound and I-64 eastbound, heading from totality back to Louisville. Scale: 41 miles from the Ohio River to State Route 250 at the top of the map.

# LOUISVILLE ASTRONOMICAL SOCIETY

The Louisville Astronomical Society (LAS) is a non-profit organization focused on the development and promotion of astronomy among the people of the greater Louisville area. They have nearly 250 active members. The club was a participant in the eclipses of 2017 and 2024 providing well over 100 hours of public outreach programming to schools, Scout and other groups, including at Falls of the Ohio State Park (see other panel). Several examples are below. For the 2024 eclipse, the LAS partnered with local television station WDRB to provide live eclipse coverage in Seymour IN, which was viewed by over 60,000 unique individuals.

LAS helped WDRB with an eclipse watch event in Seymour IN (55 miles from Louisville). Marc Weinberg, chief meterologist at WDRB-TV, said, "The total solar eclipse was an incredibly importnt event to WDRB. We had been talking about the 2024 event since the 2017 epic eclipse. In anticipation of the interest, we devoted significant time promoting the event and planning for our coverage. The Louisville Astronomical Society was the perfect partner for this event because of their knowledge and telescopes we could use for our on-air and online special. Their real-time images of the eclipse helped WDRB achieve huge ratings for this event. The group at LAS are rock stars!"

WDRB's meteorologist Hannah Strong said, "This incredible view from our telescopes! [The] Louisville Astronomical Society deserves all the credit and then some for being out here with us today, giving us these views you can't get anywhere else. This is amazing!"

Seymour IN eclipse, WDRB (https://www.wdrb.com/eclipse/crowds-turn-out-to-watch-great-american-eclipse-in-southern-indiana-kentucky/article_3f57722e-f5ba-11ee-92b2-5b946f893177.html), 8 Apr 2024, with Louisville Astronomical Society - 3 short videos, including LAS President Steve Katsikas.


Two photos above: Eclipse watch at Seymour IN. LAS President Steve Katsikas provides images for WDRB-TV coverage, Apr 8, 2024. Source: screenshots from WDRB-TV video.

LAS Secretary Tom Hayes assisted at an eclipse watch in Princeton IN (below) -- 110 miles from Louisville.

[VIDEO] https://res.cloudinary.com/amuze-interactive/video/upload/q_auto/v1736355446/aas/C1-FD-57-20-FC-15-10-42-AD-AB-2B-33-E3-07-49-F5/Video/Gibson_county_Interview_izihcv.mp4

Video: Interview with Tom Hayes at an eclipse watch at Gibson County Fairgrounds, Princeton IN, Apr 8, 2024. Source: WFIE-TV, Channel 14, Evansville IN

LAS member Cheryl Russell gave a presentation after a wedding in Nashville IN (85 miles from Louisville), just before the eclipse. She got a video of the shadow bands and of totality (below).

[VIDEO] https://res.cloudinary.com/amuze-interactive/video/upload/q_auto/v1736739999/aas/C1-FD-57-20-FC-15-10-42-AD-AB-2B-33-E3-07-49-F5/Video/video_russell_c_eclipsetalk20240408a_e7nauo.mp4

Video: Shadow bands, Nashville IN, by LAS member Cheryl Russell, Apr 8, 2024

[VIDEO] https://res.cloudinary.com/amuze-interactive/video/upload/q_auto/v1736740011/aas/C1-FD-57-20-FC-15-10-42-AD-AB-2B-33-E3-07-49-F5/Video/video_russell_c_eclipsetalk20240408b_x0ukej.mp4

Video: Totality at Nashville IN, by LAS member Cheryl Russell, Apr 8, 2024

# DISCUSSION/CONCLUSIONS

Despite not being on the path of totality, there were a number of several eclipse activities in the Louisville area in the run-up and on Eclipse Day. Many residents saw the partial eclipse or went to totality, and up to 10,000 tourists came for each of two days preceding it.

The public is interested in eclipses, but often has misconceptions about the difference between partial and total eclipses, and about eclipse eye safety. Schools, universities, local government, museums, planetariums and local media coverage all can play important roles to provide information to understand and appreciate this rare, beautiful phenomenon.

POSITIVE POINTS:

MEDIA: The local media were very pro-active to help educate the public in the run-up to Eclipse Day. Having totality in the media catchment area, and not necessarily within city limits, is enough to make an eclipse a major event for education, public outreach and tourism.

GRASSROOTS: Successful efforts tended to be grassroots, from the bottom-up, rather than from the top-down from government or large institutions. However, where there was top-down support, for example from Spalding University for its eclipse expedtion to Waterfront Park, from the Indiana Dept. of Natural Resources for Falls of the Ohio State Park in the form of a telescope and solar filter, and from the KY Science Center to earn a grant from NASA for activities, it did help to enhance people's eclipse knowledge and experience. Having a local science museum spearhead activities was a major advantage for the community.

SCHOOL CLOSURES: The proximity of Louisville to totality meant that many people who were interested in the eclipse actually went to totality, with strong media coverage providing encouragement. It was a big help that local schools were closed, and that many students convinced their parents to go. Similarly, some of those in U. Louisville's general astronomy and special eclipse classes also went to totality, though having many classes take place under the normal schedule several universities kept a number of students, faculty and staff on/near campus instead. Those who had work or other commitments or who could not travel also had to stay for the partial eclipse, or miss it entirely.

THE LOUISVILLE ASTRONOMICAL SOCIETY was a huge help for the media and community in terms of outreach.

ECLIPSE AMBASSADOR programs were also a big help for outreach to teach people to pass on knowledge, both from the NASA Partnership with the ASP and the National Science Foundation partnership with the NSTA. However, the small number of people in the programs (2 with NASA/ASP and 1 with NSF/NSTA for all of Louisville) limited the effects of the programs.

INSTITUTIONAL SUPPORT FOR ECLIPSE WATCHES by Bellarmine U and Spalding U, and in local parks, helped residents, students, faculty and staff view at least the 99.3% partial eclipse in the Louisville area, serving a few thousand people.

THINGS WHICH CAN IMPROVE:

TOURISM increased in Louisville by up to 10,000 people spending the weekend before, with a rough impact of up to $2M. This was without any known advance out-of-town advertising or planning for events in Louisville for visitors. With up to 1M people driving through KY to get to totality in neighboring states, it is possible that advertising and planning events 1-2 days before (or after, if on a weekend) could boost tourism numbers and income for cities within a 1-2 hour drive from totality.

EARLY PLANNING: It cannot be stressed enough to plan early, especially for large organizations like cties, school districts and universities which have established annual calendars. For institutions with annual schedules set a year or more in advance, planning 2 years ahead can be necessary. However, it is often challenging to make

the case to administrators and civic leaders for special efforts when coverage has not yet ramped up in the media, and/or such leaders have not experienced totality themselves. A number of people remembered the partial eclipse from 2017, which had totality 120 miles away, and thought that the 2024 event, with totality 35 miles away, would be similar. It often took at least one or more presentations with pictures and videos, or a number of eyewitness accounts of totality, to convey the difference between a partial and total eclipse.

PLANETARIUM: An operational planetarium would be a great asset for public outreach. The Evansville and Butler U (Indianapolis) planetariums reached/informed thousands of people via shows to schools and the public.

SCHOOLS, UNIVERSITIES, SCOUT GROUPS AND LIBRARIES can be extremely important, because students can teach parents, siblings or friends and multiply the impact of advance outreach events in the classroom or on campus. They also can play a leading role in the effort to provide eclipse glasses to their members. Allowing students -- and by extension their families -- to go to the eclipse, if it is a one day trip, is an extremely important educational opportunity which can occur perhaps once in a lifetime. In contrast, lack of institutional support and maintaining normal schedules makes viewing and learning from the eclipse more challenging. Central institutional support in universities and schools is crucial, because expenses for outreach and expeditions to totality for more than a few carloads of people are typically beyond the means of student organizations and individual departments.

LOCAL GOVERNMENTS can play a crucial role in encouraging eclipse (and science) education by providing even one to a few hours off for non-critical personnel to view an eclipse with family members, and as an example to local businesses.

SUGGESTIONS FOR THE NEXT CITIES ON THE EDGE:

The following cities are "on the edge" in North America: 2033 - Fairbanks, Anchorage; 2044 - Billings, Spokane, Regina, Saskatoon, Prince George; 2045 - San Francisco, Sacramento, Denver, Denver, Wichita, Springfield MO, Memphis, Mobile, Birmingham, Jacksonville. It is hoped that they will learn from the Louisville experience, inform and enable their residents to enjoy a partial eclipse or go to totality, and welcome visitors passing through with hospitality and programs. Given the relatively rapid turnover of school, university and government leaders compared to eclipse cycles, the following may help to overcome the loss of institutional and personal memories.

NASA has the most respected voice about space science in the US, followed by the NSF, AAS, ASP and NSTA. These organizations should work together to make "eclipse packs", videos etc. for astronomers to give to their mayors, university presidents, Scout Councils and troop leaders, school superintendents, principals and teachers. The goal would be to encourage support for outreach programs and opportunities for people to see and appreciate the eclipse, either the partial one on site or totality nearby.

Universities, schools and Scout groups can teach and inspire younger people to be teachers for the population at large. It is often not effective for one or a few faculty members or teachers to work up the administrative ladder to request institutional support for outreach programs and permission to see the eclipse or organize short eclipse outings for their members. In addition to eclipse packs, it would be helpful to university faculty and teachers to be able to call on national or regional experts from NASA, NSF, AAS, ASP and NSTA for help to convince local government and educational administrators to make -- and support -- special outreach and viewing plans for eclipses in their areas.

Because discussions should be opened at least two years in advance for large institutions with set annual schedules, eclipse pack aids for astronomers and teachers should be made available before that, perhaps three years in advance of totality. For the 2033 eclipse, which is a good test-bed for the Great 2045 Eclipse, materials should be ready by 2030. It is time to start planning soon!

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TRANSCRIPT

# ABSTRACT

We summarize the preparation and outreach events for the Great North American Eclipse of April 8, 2024, plus the preceding partial solar and penumbral lunar eclipses, at U. Louisville, in Louisville Metro and the surrounding area. The Louisville area (pop. 1.4M) was one of the largest cities within ~50 km of totality with a 99.3% partial event, similar to the situations for St. Louis, Detroit, Cincinnati and Toronto. Louisville was also close to but not in totality in 2017 (200 km, 96%), so it has a unique perspective among large North American cities by having two near-total eclipses in 7 years -- twice in the twilight but never in the darkness. This report is a collaboration between faculty/students at U. Louisville and the Louisville Astronomical Society (LAS), with 250 members and active since 1933. Further information about LAS and the local response to the eclipse can be found at louisville-astro.org (http://louisville-astro.org/) .

Regional response was highly varied. There was much grassroots enthusiasm, which ramped up about three months before the eclipse. Local schools were mostly closed, while most of the universities were open. As with cities in totality, there were common misconceptions to address, for example eclipse safety and the difference between a 99% partial vs. a total eclipse. We will report on the activities of members of LAS, U. Louisville faculty/students plus others for conducting NASA Partner Eclipse Ambassador events, presenting at Astronomy on Tap, making presentations to schools and libraries, distributing eclipse glasses and leading eclipse watch events or outings in parks, plus the activities of youth groups such as Scouts and coverage by the media -- all done without the support of the Rauch Planetarium, which has been closed since 2020. We encourage the development of a ready-made kit and consultative support from NASA, NSF, AAS and similar organizations for both professional and amateur astronomers in future totality borderlands. This would help them to make the case to their local authorities and institutions for eclipse preparation activities despite not being in totality.