THE UNIVERSITY OF FLORIDA'S
1984 ANNULAR SOLAR ECLIPSE EXPEDITION

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Glenn H Schneider, one of the world's most passionate eclipse chasers and a brilliant astronomer, software developer and instrumentalist, unfortunately died February 2025 at the age of only sixty-nine. Much has been written about his remarkable "addiction" for experiencing solar eclipses and his many eclipse expeditions.

However, most do not know much about his account of the 1984 May 30 annular solar eclipse and its heartbreaking conclusion since his "umbraphillia website" only provided a few brief sentences about this unusual eclipse—a tale from his early professional life.

But, I can tell his story since Glenn was an exceptional graduate student at the University of Florida (1978–85) where I taught and where he earned his doctorate. In fact, we often observed lunar and asteroid occultations together. Yet our most significant event, we thought, would be observing this unique eclipse.

The 1984 eclipse was historically remarkable for its rarity, a "broken" annular eclipse that borders between annularity and total due to its brief duration of only several seconds and an eclipse magnitude of 0.9980 (Figure 1). Fred Espenak wrote about "The Great Annular Eclipse of 1984" (*Astronomy*, May 1984), Roger W. Sinnott discussed this eclipse as "Not Annular After All?" (*Sky & Telescope,* November 1983), and many others produced extensive materials about this event. Moreover, this was also the first "annular" eclipse for the USA mainland in nearly thirty-three years (1951 September 1).

This was not Glenn's first solar eclipse since his first in 1970 changed his life forever as he later noted (2012, his website). Unlike the 1970 total eclipse, the 1984 was annular. In fact, Glenn wrote that "I don't do annulars" due to economics (Email, May 2001)!

However, the 1984 eclipse inspired Glenn to help devise an ingenious device to help evaluate the solar angular diameter to test the hypothesis that the Sun's diameter is slightly variable.

Our instrument was a horizontal Celestron 5 Schmidt-Cassegrain optical assembly with a full aperture density 5 chromium filter and coelostat to bring the solar image into a high speed Arriflex 35 mm movie camera. A coelostat mounted 5-3/4 inch, 1/8-wave optical flat brought the solar image into the fixed telescope/camera system.

A WWVB antenna provided time signals onto the movie film. The Ariflex was run at 64 frames per second and a digital time code from a WWVB receiver placed in front of the coelostat was optically encoded on each frame for an absolute time reference (Figure 2).

We tested the system in our department with a short length of movie film that we developed in our dark room. In fact, all went very well. This would prove significant later.

The eclipse path entered the U.S.A. mainland just west of New Orleans moving through Atlanta, Georgia into the Carolinas and exiting the country south of Richmond, Virginia through Delaware. A decision was made to head for Greenland, South Carolina to observe the eclipse (Figure 3). The driving distance was only about seven hours and weather looked favorable.

So, we headed north from Gainesville, Florida the day before the eclipse with both a van for the instruments and my station wagon for the rest of us. With us were also department technician Don McNeill, Santa Fe College Professor Sally Hoffman, and Karla Rahman, whom Glenn would later marry in 1985.

Glenn proposed using his old van but it was not in condition for the long drive having a hole in the floor! We left Glenn's old van for my wife in Gainesville to drive in my absence. (She was not thrilled!)

We visited the League Middle School in Greenville in Northwest South Carolina near the center line where we planned to observe the eclipse. However, we were concerned about weather after arriving. (Without the Internet, getting good weather information was primitive compared with now.) We set up our WWVB antenna at the school but the weather forecast was bothersome. That night all five of us spent a sleepless night in a motel room worrying about the weather.

Finally, we decided to change plans and hastily left the school early in the morning driving rapidly south on I-85 hoping to get out from under a frontal cloud cover. (Fortunately, I-85 ran nearly parallel to the eclipse path for more than 600 miles.) We left at 8:45 a.m. EDT though meteorology reports said skies would clear by late morning. Nevertheless, this was chancy since the eclipse would begin shortly before eleven o'clock.

Later we learned that Greenville skies did clear in time for the eclipse. However, according to the National Weather Service (weather.gov/ilm/1984eclipse), many areas along the East Coast were covered beneath thick clouds with rain and missed seeing this eclipse (Figure 4).

As I drove southwest on I-85 I still distinctly remember seeing a wide swath of blue sky ahead with a remarkably sharp boundary between clouds and clear sky. We all hoped to reach clear weather beyond the clouds before the eclipse began and in time to set up our equipment. It is an understatement to say that we were a bit stressed!

Luckily, we did finally move out into clear skies and turned off the Interstate hoping to find a suitable site for our observation. Soon we discovered a factory on the right-hand side of a road, the Pendleton Finishing Plant Milken and Company, a "finishing plant" for floor coverings and textiles. And it had a large open field on its north side (lat. 34°37'32.6" N; long. 82°47'05.3" W)!

I am not sure how we found this factory. The USNO Eclipse Circular had only very crude maps of the eclipse path back then. However, I had highlighted I-85 on my copy in yellow through the Carolinas. Careful inspection showed US 76 going north from I-85 and into the eclipse path toward Clemson, South Carolina. (This highway was unlabeled on map.)

Therefore, once we got out from under the cloud cover, it would have made sense to go north on US 76, which would then take us right into the path of annularity. The factory was about six miles north and about a quarter mile east of US 76. Not sure how we ended discovering this exact factory since the factory is not visible from US 76. See Figures 5.

We rushed in and fortunately gained permission to set up in their adjacent field (Figure 6).

I later estimated our observing field was only about 350 meters (1,150 feet) inside the path edge and 3.88 kilometers (2.41 miles or 91%) from center line! Did we realize this back then? Of course, this likely increased the beading for an eclipse that was already almost total, a possible favorable circumstance.

It is also interesting that the 2017 August 21 total solar eclipse centerline crossed the 1984 annular one at only about five kilometers (about three miles) from this place.

It was a bit of a rush setting up since the eclipse would soon begin and the duration of annularity would be only several seconds. But, we did it. And the sky was perfectly clear (Figures 7 and 8). And the instruments worked and the beading was spectacular.

Glenn later wrote, “While not a total, it was an amazing event but we did see an amazingly extended chromospheric arc ‘rotate’ around the limb as we were slightly off the center-of-figure line. That arc was punctuated,” he noted, “with some ‘deep’ beads which added to the unusual appearance of that eclipse.” (Email, 2001.) See Figures 9 and 10.

In addition, Glenn held up his thumb at arms length after third contact to block out the photospheric light, and said he could see the diminishing corona for more than half a minute.

So, we returned to Gainesville, a happy bunch of eclipse chasers, not realizing our experiment would be for naught. See Figures 11 and 12.

We had originally processed our test films ourselves. However, our film of the eclipse was too long to process easily in our own darkroom. Therefore, we gave the film to a local professional film processing company.

When the company returned the film to us, we could barely see the eclipse images and the film appeared cloudy. Of course we were extremely distraught and disappointed. We had been very careful to handle the film and could only guess they either had carelessly handled the film or fogged the film from bad processing. A real bummer.

Although chasing this eclipse was tiresome and challenging, we had all experienced a unique eclipse. Regrettably, our efforts to obtain some useful scientific results were, nevertheless, not to be. Still, it’s an eclipse story to tell.

So, one could chalk this up to one of Glenn’s unattended failures. Yet, undaunted as he was, Glenn would go on to investigate successfully many other eclipse events. And for me, thanks to Glenn, I too became an eclipse chaser of sorts.

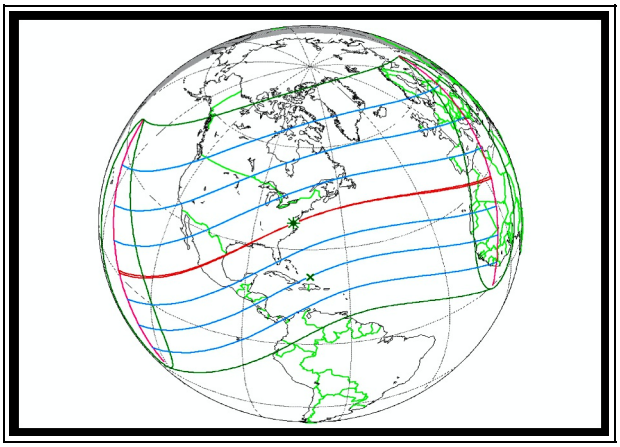

Figure 1: Annular Eclipse of 1984 May 30. A short duration annular not quite total, a "broken" annular. Eclipse track crossed S.E. U.S.A. (Cred. ©2014 Fred Espanak, eclipsewise.com.)

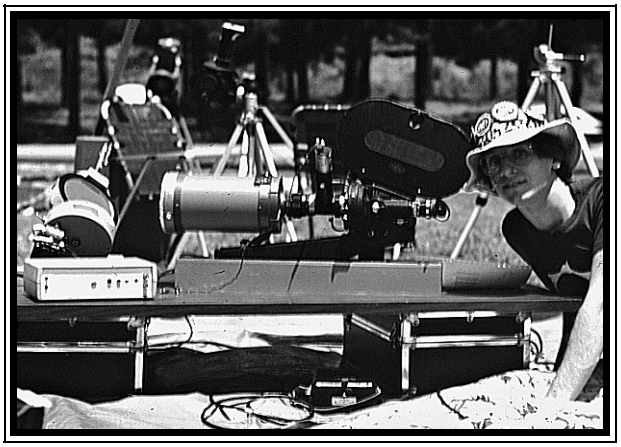

Figure 2: Instrumental Setup. Glenn with Celestron 5, coelostat & Arriflex 35 mm movie camera. WWVB receiver (in front of coelostat) added time signal codes to movie frames.

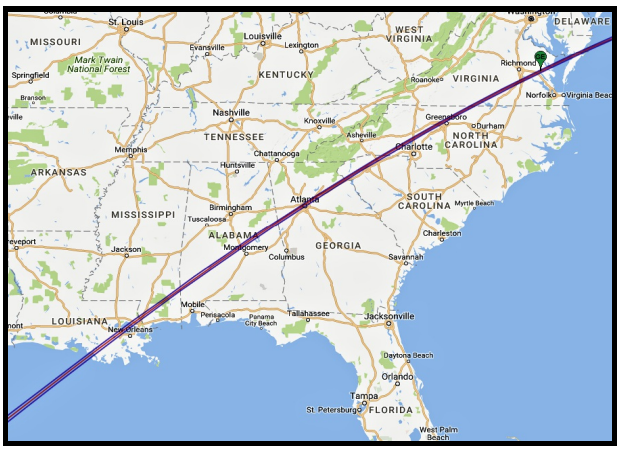

Figure 3: Eclipse Path. Annularity track went through U.S.A. from Louisiana to So. Delaware. Observing position was in Penleton, northwest South Carolina. (Cred. National Weather Serv.)

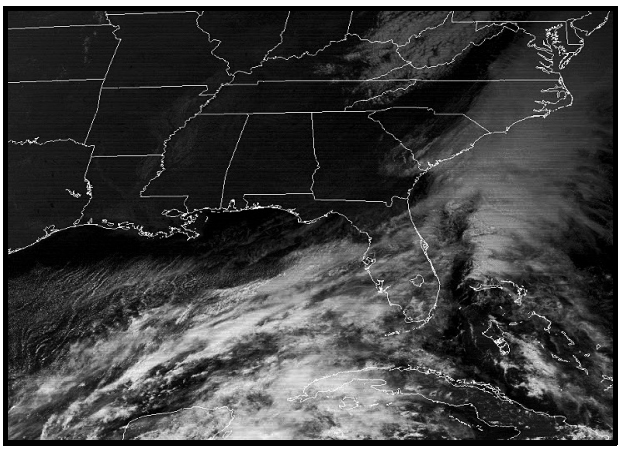

Figure 4: GOES-5 Visible Satellite 1984 May 30. Shows cloud cover across S.E. U.S.A. at time of eclipse. Observing site in N.W. So. Carolina was clear. (Cred. Nat'l Weather Serv.)

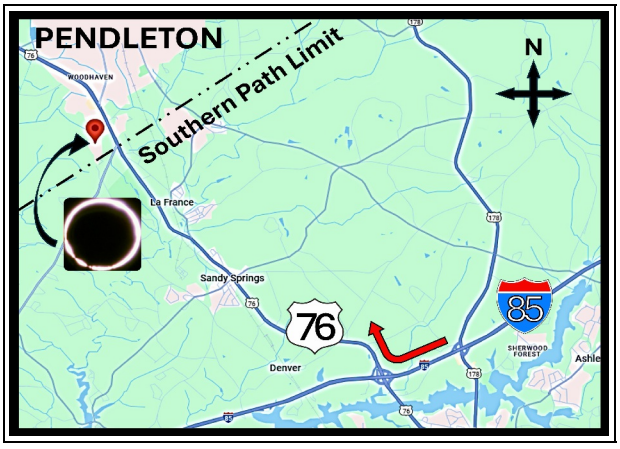

Figure 5: Outrunning Clouds. I-85 roughly followed eclipse track. Going south, then north onto US 76 led just into eclipse path south of Pendleton, SC. (Cred. Google Maps.)

Figure 6: Eclipse Observing Location. Open field on north side of Pendleton Finishing Plant Factory west of US 76, Pendleton, South Carolina. (Cred. Google Earth Pro.)

Figure 7: Observing Field. A flat open field north of the factory with crystal clear skies allowed for easy setup. Maximum eclipse occurred, just after noon, about 12:28 p.m. EDT.

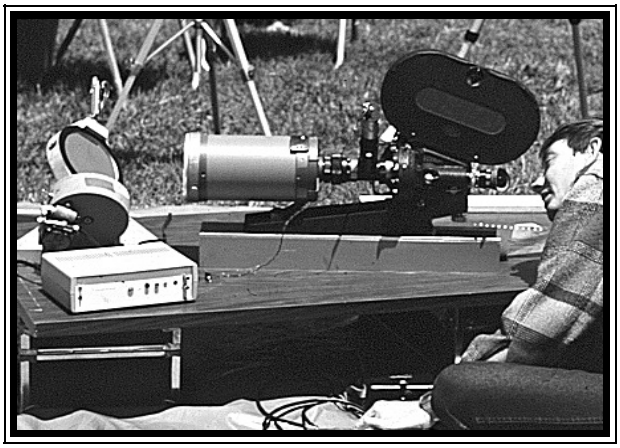

Figure 8: Setting Up Instrumentation. Don McNeill helped setup and adjust coelostat. Needed to be quickly done since first contact would soon occur after arriving at factory.

Figure 9: Broken Annular Eclipse. One of a series of images by Glenn. Shows reddish chromosphere and intense beading (Nikon EM Camera, 400mm lens, f/32, 1/90th sec, 35mm Ektachrome 64 film, unfiltered).

Figure 10: Baily's Beads. Simulation created and adapted from *Solar Eclipse Maestro* for eclipse at Pendleton. Notice the good match to photograph in Figure 9 taken near maximum eclipse at 16:27: 39 UT. (Cred. Xavier Jubier.)

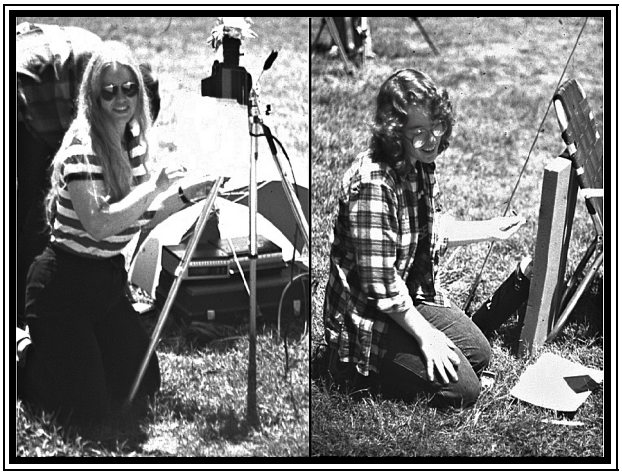

Figure 11: Sally Hoffman and Karla Rahman. Other cameras and devices were set up with the help of all participants. Everything seemed to work fine with the Sun 71-1/2° high at maximum eclipse.

Figure 12: UF Expedition Members. (L to R) Sally Hoffman, Karla Rahman, Howard Cohen, Glenn Schneider, Don McNeill. Celebratory eclipse flag (made 1972) loaned from veteran eclipse chaser and astronomer Craig Small.