

## The Multistation 1995 Leonid campaign in California

Peter Jenniskens, Mike Koop, Chris Angelo, Mike Wilson

During the Leonids of 1995 a small network of camera batteries was employed in the San Francisco area of California with the purpose of capturing orbital elements of outburst Leonids. Prior to the Leonid campaign, Mike Koop and Peter Jenniskens built a third camera battery to augment the two similar systems used previously. Each system consists of a high battery with 4 cameras of f 1.8/40mm optics and a low battery with 8 cameras of f1.8/50mm calibre. Hans Betlem provided the rotating shutters which are powered by a car battery. A positive feature of these camera battery systems is that they are very mobile - compact enough in design to be folded and both easily transported (world-wide!) in a suitcase and easily stored - by keeping the system in the suitcase - currently stored in the bedroom closet.

Three stations were operated in this campaign: Fremont Peak State Park, Henry Coe State Park, and the San Luis Reservoir during the nights of November 17 and 18. Observers at Henry Coe were Mike Koop and Peter Zeruvan; at Fremont Peak were Chris Angelo, Joe Jordan, Rick Morales, Terry Call, and Duncan McNeill; while Mike Wilson, Peter Jenniskens and Gerard Heyenga were located at the visitor centre of the San Luis Reservoir. At the same time, Kathy Black in Springville (CA), south-east from us, and Rick Noltenius in the Santa Cruz Mountains, to the west, mounted a courageous but smaller scale support in the hope of capturing at least one bright Leonid...and bright they were!!! The night of November 17 was designated as a 'practice' night for some of the beginning observers in the group. However, the practice session, in actuality, became a 'true' observing session



*The bright Leonid meteor of November 18 11:45:22 UT in an exposure from Henry Coe State Park (Mike Koop)*

as several bright Leonids were observed. The biggest (and most thrilling) surprise of the night was a Leonid which appeared almost overhead at a time that the radiant was still low above the horizon.

The very long streak in the sky covered two camera fields and was captured on film from two sites. The 'practice' night Leonid rates were actually a little higher than usual - with a ZHR of order  $15 \pm 3$ .

After such a night, expectations were high for the second night. As is usually the case in Northern California during November, weather prospects were not good. A thick fog blanket loomed nearby on the ocean and there were plenty of scattered cirrus fields. Yet, miraculously, all observing sites did have clear weather for most of the night! The fog and cirrus fields did

not come inland until about 4:00 am local time.

Disappointingly, Leonid rates did not soar as expected. ZHRs went up to about 20 at best and seemed to decrease during the night. As we now know, the main Leonid peak was over Europe and those of us in California saw only the beginning and end of the Leonid activity curve. As a result of the low Leonid rates, the group at Fremont Peak stopped early. It turned out that they stopped too early because at 11:45:22 UT a very bright Leonid appeared almost overhead at this location. This Leonid was seen by the group at the San Luis Reservoir and photographed from there as well as by the group at Henry Coe. It left a persistent train that was visible with the naked eye for six minutes!!! The train was bright initially, became broader in

a matter of seconds, then it slowly deformed into a V shape and then into a circle. A previous issue of *Radiant* showed this train on the front cover in a series of 1-minute exposures taken at San Luis Reservoir. As noted above, this meteor was also photographed from Henry Coe, where Peter Zeruvan noticed the flash while watching in a different direction; however, he did not turn to check for a train. Rumour has it that Mike Koop was chasing a raccoon who had grabbed his lunch box and tried to get away with it. However, there is no way to verify the time as the raccoon was not wearing an Indiglo watch and Mike was too busy to check!

That incident may well have been earlier in the night. Mike may just have had bad luck, as he was facing north, away from the position of the meteor which was just south of Orion.

A post-campaign meeting was held at Fremont Peak Observatory on February 17, 1996. The day was a rapid succession of presentations, discussions of new ideas on far-comet type outbursts, playback of video images of the alpha-Monocerotid outburst courtesy of Klaas Jobse and Sirko Molau, an introduction of a new meteor-scatter system that is being built in the Livermore, CA by Tom Rice, flashbacks on the photographic work during the Leonids by Chris Angelo, predictions on what to expect for the upcoming Leonids, and a presentation (slides and talk) by Mike Koop about the solar eclipse he witnessed in October 1995 in Angkor Wat, Cambodia. This particular presentation was devoted to Dora Willoughby, 73, who, unfortunately, died during the eclipse expedition. Dora had joined our meteor observing group at Henry Coe State

Park during the 1994 Perseids and was planning to participate in the 1995 Leonid campaign. All of us were touched by her enthusiasm for our project. She will be missed but remembered fondly by all whose lives she touched. The meeting was con-

cluded by sharing dinner in San Juan Batista, a small town at the base of Fremont Peak mountain. We had planned to follow the DMS tradition of sharing Chinese food but found ourselves instead sharing a more traditional DUTCH dinner!

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