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Leonids of 19 November 2002

ROBERT B. SLOBINS

After last year's fog-out, I was determined to see the Leonids this year. To do this, my wife Elisabeth and I drove 700 km west from Fort Wayne, Indiana. We viewed the meteors from a corn field in Cedar County, Iowa.

The nearly full moon detracted our view of the storm, and radiational cooling bringing temperatures down to -6 to -8 C by 0900 UTC affected our concentration. I had to spend much time wiping dew and frost from the lenses, so it is likely that my counts run low.

The show was slow at first. I expected a rate at Perseid and Geminid levels throughout the night. Elisabeth saw the first earth-grazer of the night at 0545 UTC as we were driving to find an observing site. We saw several fireballs and negative-magnitude meteors at a rate of about 20-30 per hour from 0749 UTC. They left trains that the moonlight enhanced. This went on until 1015 UTC. Very few meteors we saw during these $2\frac{1}{2}$ hours were fainter than second magnitude.

At 1015 UTC, activity increased to spurts averaging one every five seconds in the third of the sky I had under surveillance. This area included the radiant. The Little Dipper was clearly visible (limiting magnitude 4-5) despite the moonlight. I was able to make out fourth-magnitude meteors in Leo's head and during this time, I saw more meteors within ten degrees of the radiant than before. There was one outburst at



Fig. 1



Fig. 2

Fig. 1. Tamron 17/3.5 at $f/3.5$, Nikon F2 body, Fuji NPZ film (ISO 800). Meteor of -5 magnitude heading into Cancer. Cirrus was heading into the area. Estimated time of appearance: 1035 UTC.

Fig. 2. Canon 24/1.4L at $f/1.4$, Canon F-1 body, Fuji NPZ film (ISO 800). Three meteors: one -7 below Leo, a «pinpoint» meteor heading at us near Gamma Leonis (Algeiba) probably at magnitude -2 and one of magnitude 0, which registered faintly, heading toward Gemini. We had been in the 1866 stream for about ten minutes (1025 UTC) as this image was made. Cirrus was in the area by 1030 UTC.

Fig. 3. Canon 24/1.4L at $f/1.4$, Canon F-1 body, Fuji NPZ film (ISO 800). The same meteor as in fig 1.



Fig. 3

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1027 with 14/minute and another at 1054 with at least 21/minute. This show was abruptly over at 1104 UTC. This gives a peak time of 1041 UTC, but it must be remembered that the Leonids came in groups. There were gaps in the activity of the order of a minute.

The brightest Leonids were -7 magnitude. These were cyan-to-green colored, reminiscent of Comet Hyakutake's color in March 1996. There were three to four golden yellow fireballs of Venus-level brightness. One fireball low in the southeast produced the longest-lasting (10 seconds) train: the dust was blown to the northeast.

Most Leonids were visible at low altitudes and through Canis Major and Ursa Major. The areas through Gemini and Bootes had the fewest meteors.

There were some small bursts of activity after 1104, but by 1200 UTC, the Leonids appeared to be completely over. As I was completing packing, one golden fireball of -6 fell in near Venus as a grand finale.

During the peak period, scattered cirrus started to cover the sky. This interfered with visibility and photography. Given the weather I could have had, I am grateful for what we saw this morning.

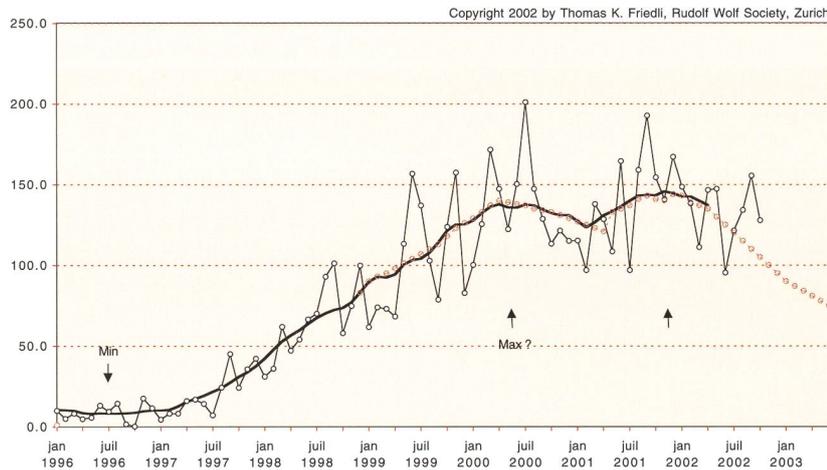
A good rule for estimating brightness of meteors is to compare them with trailed stars. I estimate that a meteor has to be 5 to 6 magnitudes brighter than trailed stars to produce an equivalent streak on the film except for those close to the radiant. This is due to the excessive speed of the meteor compared to the star, and Leonids enter the earth's atmosphere at the fastest possible speeds. Therefore, I include magnitude estimates of the meteors on these images.

ROBERT B SLOBINS
Phototake

177 Main Street #254, Fort Lee, NJ 07024 USA

Swiss Wolf Numbers 2002

MARCEL BISSEGGGER, Gasse 52, CH-2553 Safnern



September 2002

Mittel: 146.3

1	2	3	4	5	6	7	8	9	10
182	214	205	201	188	163	143	144	178	167
11	12	13	14	15	16	17	18	19	20
153	151	134	112	109	132	155	157	193	177
21	22	23	24	25	26	27	28	29	30
157	162	176	179	176	147	122	117	80	90

Oktober 2002

Mittel: 126.5

1	2	3	4	5	6	7	8	9	10	
87	94	85	101	113	109	112	117	125	154	
11	12	13	14	15	16	17	18	19	20	
191	163	160	143	158	173		140	157	171	
21	22	23	24	25	26	27	28	29	30	31
108	108	91	92	106	118	106	110	134	159	143

VERANSTALTUNGSKALENDER CALENDRIER DES ACTIVITÉS

Februar 2003

- 26. Februar 2003
20.00 Uhr: Die Schweiz im Weltraum. Vortrag von N.N., Eidg. Büro für Weltraumangelegenheiten. Ort: Sternwarte mit Planetarium «Sirius», Schwanden ob Sigriswil/BE. Veranstalter: Astronomische Vereinigung Berner Oberland.

März 2003

- 8. März 2003
Ab 18 Uhr: 11. Zumstein Teleskoptreffen Beobachtung und Gerätedemonstrationen. Info und Anmeldung: Foto-Video Zumstein, Michel Figi, Casinoplatz 8, 3001 Bern, Tel. 031/311 21 13, Fax 031 312 27 14, E-Mail: astro@zumstein-foto.ch. Internet: www.zumstein-foto.ch. Ort: Restaurant Berghaus Gurnigel Passhöhe.

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ERRATUM BERICHTIGUNG

In the paper «The equilibrium points of Lagrange» in **ORION 312**, equations (9) and (10) are incomplete. The correct equations should have been:

$$\frac{\partial V}{\partial x} = (x - x_0) \frac{\partial^2 V}{\partial x^2} + (y - y_0) \frac{\partial^2 V}{\partial x \partial y} \quad (9)$$

$$\frac{\partial V}{\partial y} = (x - x_0) \frac{\partial^2 V}{\partial x \partial y} + (y - y_0) \frac{\partial^2 V}{\partial y^2} \quad (10)$$

The computations that follow are unaffected as they were carried out with the correct equations.

GASTON FISCHER, gfisher@vtx.ch

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