



Comet, Asteroid and Meteor Section

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Comets - The third quarter of the year sees four comets which should be in reach of amateur instruments. Comet C/2021 T4 (Lemmon) might reach magnitude 7-8 during July. Comet C/2020 V2 (ZTF) has brightened to around magnitude 9 and may remain so for the next couple of months. Comet 103P/Hartley 2 might reach magnitude 8 in September, crossing the constellations of Perseus and Auriga.

Meteor showers - The annual delta-Aquariid and alpha-Capricornid meteor showers reach their peak at the end of July. Although the Moon will interfere, details are given here. The minor eta Eridanids may show some visual activity.

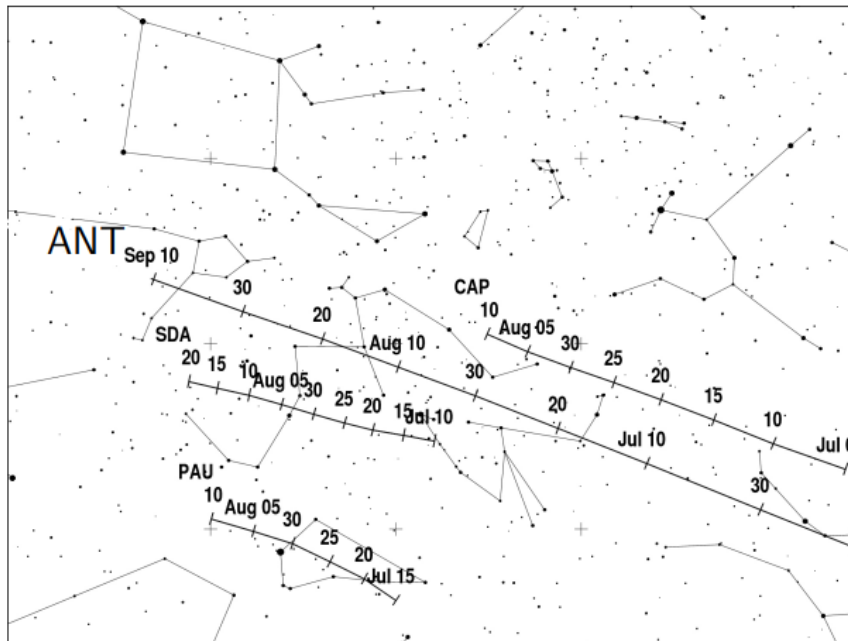
Comet C/2021 T4 (Lemmon)

This comet makes its closest approach to Earth on 20 July and is at perihelion on 31 July at a distance $r = 1.48$ AU. It will be well-placed for observation around this time, and the last few days of July provide some interesting imaging opportunities with the comet passing through Ara and Norma, through areas rich in open star clusters. The view is spoiled for visual observers by the Moon, which is full on 1 August. However, the comet will be around 1° from the magnitude 7 globular cluster NGC 5986 on the evening of 4 August, high in the sky as darkness falls, and with the Moon rising around 9pm for Johannesburg, an opportunity exists to easily locate and observe the comet visually without interference. After this the comet is expected to fade quite quickly, and will likely be magnitude 10 by the third week of August.

Southern delta Aquariid meteor shower

The Southern delta Aquariids generally produce a reliable show with ZHR about 25/hour for a day or so around maximum date about 30 July. The activity coincides with the Anthelion sources which radiate from a similar region during July, and therefore the two sources are indistinguishable by visual means. Members are medium speed, often faint outside maximum date, but often produce brighter meteors

during their peak. The radiant positions for the Southern delta Aquariids and Antheion meteors, along with the nightly drift eastwards are shown in the diagram below. Note also the nearby alpha Capricornid and Piscis Austrinid radiants, and care needs to be exercised to assign meteors seen to the correct radiant. The alpha Capricornids are noticeably slower moving. The shower can be observed from around 10pm local time until dawn. However, the bright Moon will interfere with observations on most mornings.



Drift in radiant positions with date for the Southern delta Aquariids (SDA), alpha Capricornids (CAP), Piscis Austrinids (PAU) and Antheion meteors (ANT). Diagram courtesy of the Meteor Shower Calendar, International Meteor Organisation.

alpha Capricornid meteor shower

The alpha Capricornids are the debris left behind by comet 169P/NEAT, and reach their maximum about the same time as the Southern delta Aquariids nearby. The rate however is much lower, with ZHR generally around 5-10 per hour, although enhancements to about double this figure has been observed on occasions. The meteors are slow moving, velocity 22 km/sec, compared to the 41 km/sec of the Southern delta Aquariids. The shower has a tendency to produce very bright meteors, often fireball brightness.

Comet C/2020 V2 (ZTF)

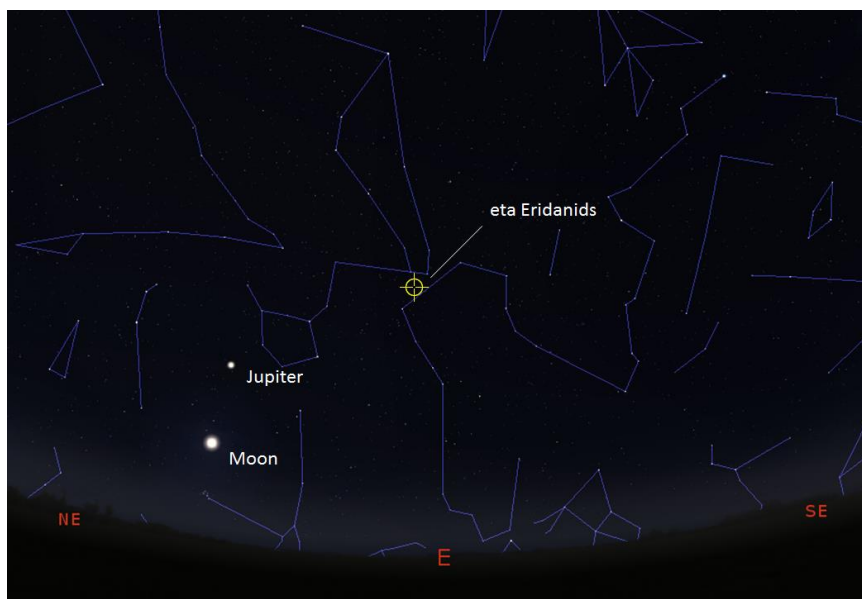
The comet has already passed its perihelion (8 May) and is headed back out into the outer solar system. In doing so it will make its closest approach to Earth on 17 September, albeit at the rather wide distance of $\Delta = 1.9$ AU, and when its distance from the Sun will be $r = 2.7$ AU. At closest approach it will likely be a magnitude 10 object near the border of Cetus and Fornax.

Comet 103P/Hartley 2

Comet Hartley 2 was discovered in 1986 following a close approach with Jupiter four years earlier that perturbed the comet's orbit. The comet orbits the Sun with a period of 6.46 years, and can become quite bright if it passes close by to Earth, as was the case in 2010 when it passed by at a distance of only 0.12 AU, reaching magnitude 5. Conditions this year are not as favourable, closest approach occurs on 26 September at a distance of 1.1 AU, and the comet is at perihelion on 12 October when it might reach magnitude 8. A nice imaging opportunity occurs on the morning of 13 October when the comet will be just over half a degree from NGC 2392, known as the Eskimo or Clown Face Nebula.

eta Eridanid meteor shower

The eta Eridanids are a minor shower possibly associated with comet C/1852 K1 (Chacornac), and were added relatively recently to the IMO Meteor Shower Calendar. They peak around 8 August from a radiant at RA 02h44m, Decl. -11° and shown in the diagram below. On the night of predicted maximum the near-last quarter Moon interferes. However, there is evidence that activity continues for some days past this date, and observations are required to better characterise the shower. Observe from 02h00 until dawn, the later the date the less interference from moonlight. With a speed of 64 km/sec the eta Eridanids are fast-moving meteors.



Radiant position for the eta Eridanids, view is for 02h00 on 8 August from Gauteng

Clear skies *Tim*