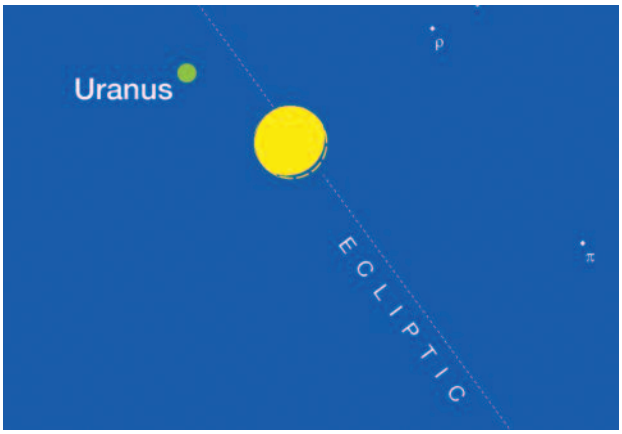
## URANUS

Uranus (mag.+5.7, disk 3.8") is an evening planet in Aries this month. On the morning of Oct.12th it gets extremely close (0.6° in a twilight sky) to the almost Full Moon (94%), see Moon notes and diagram for this very special event. On Oct.1st Uranus rises at 8:20pm, but by Oct.31st it rises at 6:20pm. It will still be seen highest around 3am mid month however. Uranus barely moves all month and lies in the lower left of the constellation of Aries, about 13 degrees to the right of the Pleiades.




*October 12th (Wednesday) at 7am: Uranus (mag.+5.7) gets to within 0.6° of the Moon (94%) as dawn breaks, high in the West. See Moon notes. Special 5° wide diagram to match the view in binoculars with stars to mag. 6.5*

## NEPTUNE

Neptune (mag.+7.8, disk 2.35") was at opposition on Sept.15th in Aquarius, so it is an evening object this month. The Moon does not get particularly close to Neptune this month so nothing special about Neptune in October. Locate it about 5 degrees below the 'Circlet' of Pisces, or about 8 degrees to the right of Jupiter.

# ORIONID METEORS - Evenings of Oct. 20,21,22

This is a reasonable shower producing around 20 to 30 meteors an hour in ideal conditions. The peak is very broad with the night of Oct.21st/22nd probably being best, but the night before and after could be as good or better so view all 3 nights if you can.

Orionids appear to radiate from the border of Orion and Gemini a location which does not rise from Ireland until after 10pm so it's a late night for Orionid watchers. The Moon rises on Oct.21st at 2:50am and is a 20% sunlit crescent so it shouldn't interfere too much. On Oct.22nd it's even thinner at 13% and does not rise until 4:07am so it will hardly have any affect that night.

The famous Comet Halley is the cause of this shower which runs from Oct.2nd to Nov.7th but maximum is a slow affair over several nights. Note that there have been outbursts before so keep a watch if skies are clear.

# PARTIAL SOLAR ECLIPSE October 25

### By David Moore

**On Tuesday morning Oct.25th Ireland will witness a Partial Solar Eclipse. You can view it safely if you take the precautions we describe here but never look directly at the Sun even when it is partially eclipsed as you can damage your eyesight permanently.**

From roughly 10am to 11:30am roughly 20% of the Sun's diameter will be covered by the Moon. You may remember last year (June 10th, 2021) when 40% of the Sun was covered. That was the last partial solar eclipse visible from Ireland and the next won't be until April 2024 when 30% is covered as seen from Ireland.

Aside: A Total Solar Eclipse is much more spectacular, and extremely rare. Ireland's last Total Solar Eclipse was in 1724 and we won't have another on this island until 2090. So, we have organised several 'eclipse trips' to easy to get to places around the world, the last being 2017 in the USA (Nashville) which was hugely successful. We are beginning planning for the April 2024 total eclipse that also crosses North America so stay tuned for that.

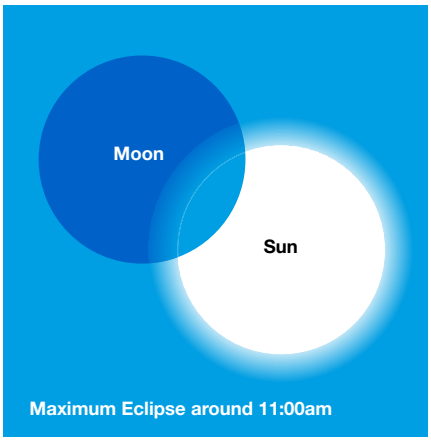
## WHAT TO SEE

At roughly 10:07am the Moon will make contact with the top left edge of the Sun. It will then slide to the lower left taking a bigger chunk out of the Sun until 10:51am when the maximum (20% of the Sun's diameter) will be covered. By 11:36am the Moon will move off the left edge of the Sun altogether and that is the last Irish solar eclipse you will see for 18 months.

At these times the Sun is rising higher in the southeast and starts off at a respectable 14 degrees above the horizon at 10:07am. By the end of the eclipse at 11:36am the Moon is 21 degrees up. Make sure you have a relatively clear horizon in the southeast to south direction.

## SAFE VIEWING

Of course it can be highly dangerous to view the Sun and a partially eclipsed Sun is just as dangerous - perhaps more so as people will be drawn to looking at it. NEVER look at the Sun with ANY optical aid (binoculars or telescopes) as permanent eye damage can happen instantly. It is not even safe




to look at the Sun with just the naked eye and even several pairs of sunglasses should not be used. But there are SAFE ways to view the eclipse:

## 1. PINHOLE METHOD

All you have to do is punch a small (1mm to 2mm) hole in a sheet of paper or card and pick up the sunlight that passes through it on a sheet of white paper a few feet away. You won't get the clearest close up views but you will see the 'bite' being taken out of the Sun.

No. 1 Pinhole Method

## 2. ECLIPSE GLASSES

We still have a few of these left over from previous eclipses for sale and they are EU certified safe for solar viewing (If you have a pair of eclipse glasses make sure they have the EU certification). You should keep these glasses after the eclipse for viewing giant 'naked eye' sunspots that appear

### Details Around Ireland

| | Start | Maximum (Diameter / Area) | End |
|---|---|---|---|
| Galway | 10:07:38 | 10:50:18 (19% / 10%) | 11:34:26 |
| Cork | 10:10:01 | 10:50:47 (17% / 8%) | 11:32:56 |
| 53N,8W | 10:07:47 | 10:51:14 (20% / 10%) | 11:36:11 |
| Donegal | 10:05:16 | 10:51:14 (23% / 13%) | 11:38:50 |
| Dublin | 10:06:49 | 10:52:50 (22% / 12%) | 11:40:28 |
| Belfast | 10:05:02 | 10:53:10 (25% / 15%) | 11:43:00 |

Times are Irish Summer Time (hour:minute:second), sorted by 'Maximum' Time. "Diameter" is the fraction of the Sun's diameter that is covered by the Moon, and "Area" is the area of the Sun's disk covered i.e. how much light/heat will be lost. Tip: Get the exact time from website: www.time.is

No. 2 Eclipse Glasses Note EU "CE" certification

from time to time (especially with a new solar maximum on its way). DO NOT look through binoculars or telescopes while wearing eclipse glasses as they give way too bright an image and may even damage the glasses and your eyesight too.

## 3. PROJECTION METHOD

This should only be used for binoculars or small telescopes as the amount of sunlight being focussed into the eyepiece can damage the optics (large telescopes should be stopped down to a couple of inches - as small as you can get away with.) If you do use this method it is VERY important to supervise the telescope if it is being used for group viewing. At Solar Eclipse Watches we have run in the past small children are drawn to the eyepiece when they see a telescope unaware of the dangers. I certainly recommend this method if viewing on your own, and it works great with binoculars (cap one of the front lenses and use a white card a few feet behind the eyepiece). With a small telescope, use a low power eyepiece in a telescope so you get the whole Sun and use an inexpensive eyepiece just in case the intense light going through it causes any damage.

No. 3 Projecting using binoculars

## 4. FILTERED TELESCOPES

The experts will already know about this but you can get special solar filters that fit securely over the front of your telescope so that no intense light ever gets into the telescope in the first place. This way you can use the full aperture of your telescope for the sharpest results which hopefully will include a few sunspots. You can make your own filters from sheets of special metallised film as well. Make sure whatever filter you use is certified safe for solar viewing as with the eclipse glasses.

Above all, practice safe solar viewing, and let us know what you see or photograph for a special report in our next issue: **magazine@astronomy.ie**