

## Guide to Meteor Showers.

Meteors (shooting stars, falling stars, etc.) are usually grains of dust, often left over from a Comet's breakup or shed by it round its orbit. They normally appear as a soundless streak of light as they burn up high in the atmosphere. Sometimes they are big enough for a piece to survive and fall to earth as a meteorite.

The visible trail of the meteor is not the meteor itself, as this is far too small. What you see is the white hot ionised gas given off as the meteor vaporises when it enters the upper layers of our atmosphere, and the atmosphere itself heated white hot by the friction of the passage of the meteor. A typical meteor trail starts some 80-100km above the earth's surface and is caused by a sandgrain sized particle of iron or stone travelling at up to 80km/second.

Although on a clear night there are always a few sporadic (occasional) meteors to be seen, mostly they fall in showers associated with the orbit of the parent comet (often broken up). The main showers are:-

Shower	Dates	Maximum	Radiant	ZHR	Comments	Parent
Quadrantids	Jan 1-6	Jan 2/3	15.5h +50	100+	Sharp max	
Lyrids	Apr 20-23	Apr 21/22	18.2h +32	25	Fast, bright	Thatcher
<i>n</i> -Aquarids	May 01-10	May 6	22.4h -01	35	Fast, persistent	Halley
<i>d</i> -Aquarids	Jul15–Aug23	Jul 29	22.7h -17	20	Faint	
Perseids	Aug 1-20	Aug 12	03.1h +58	75+	Fast	Swift-Tuttle
Orionids	Oct 16-27	Oct 20/21	06.5h +15	25	V.fast, trails?	Halley
Taurids	Oct 20 -	Nov 4/5	03.8h +14	~10	V. slow	Encke
<i>Double Radiant</i>	- Nov 30	Nov 11/12	03.8h +22	~10	flat maximum	
Leonids	Nov 15-20	Nov 16/17	07.5h +32	30++	Bright	Tempel-Tuttle
Geminids	Dec 7-15	Dec 13/14	07.5h +32	75+	Bright	Phaethon

The tracks of the meteors of a shower seem to radiate from a point in the sky, the Radiant. The co-ordinates of the radiant are given and the shower is named after the constellation which contains the radiant. You will need to find out how celestial co-ordinates work if you are to know in which part of the visible sky the radiant is located, or at least know how to find the constellation (Planisphere?).

Showers are best seen on the night of the maximum. If you cannot observe that night, some of the showers have a very flat maximum and good observing can usually be had on adjacent nights, see the observing period and don't forget to alter most dates in a Leap year!

The ZHR is the Zenith Hourly Rate. This is the number of meteors that you would see on a clear night if the Radiant was at the Zenith (i.e. overhead). The actual rate that you see will depend on how much of the sky is visible (and unclouded!) as well as the height of the Radiant (this also depends on the observing time!). Strong moonlight will also prevent you seeing many trails. You cannot see much more than 50% of the ZHR as your field of vision doesn't cover the whole sky.

The brief notes tell you how bright, fast, etc., as well as if they leave trains or are persistent.

When observing meteors, plan to watch for at least an hour, without a break. You should have a good view of the sky with a low horizon. The best way is to sit facing the Radiant in a reclining chair (e.g. sunlounger!), you may need to wrap up warmly! Try to open your eyes wide and watch as much of the sky at the time as possible, because most meteor trails will generally not start at the radiant itself. You should be quick to focus your eyes on any trail as they often only last for a second or so, of course you will not expect to hear any sound they may make! Remember that your eyes are more sensitive to light when not looking directly at something and are only really "dark adapted" until after about 20 minutes.

See also: <http://www.meteorwatch.org> & <http://www.imo.net>

### **GOOD METEOR WATCHING!**

Jon Laver FRAS