greater than 40°. The limiting magnitude should be carefully recorded for each session, along with the UT and the center of the field of view of the observer. The most basic observations should include an estimate of the brightness of the meteor, the time of observation, and a shower association (based on the radiant and apparent speed of the meteor). Information on collecting and reporting scientifically useful observations can be found at the International Meteor Organization's website, www.imo.net.

TABLE OF METEOR SHOWERS FOR 2020

The table lists the major visual showers as well as those detectable by radio methods during the day. Of the strongest annual showers, the Moon is favourable for the **Quadrantids**, **Perseids**, and the **Geminids**. The peak timing and Moon phase in particular favour North American longitudes for the Quadrantids in 2020. Some models predict an outburst for the Ursids in the early UT hours of Dec. 22 in 2020, but this remains uncertain.

	Max Date	λ			θ		Moon		RA	Dec	*v*
Shower	UT	2000	***D***	**ZHR**	×10^{-6}	***R***	%	***r***	h m	°	km/s
Quadrantids	Jan. 4 9h	283.16	0.6	120	8.4	✓	61+	2.1	15 20	+49	43
April Lyrids	Apr. 22 6h	32.3	1.3	20	4.6	✓	1–	2.9	18 10	+34	48
η-Aquariids	May 5 5h	45.5	5	60	6.4	>03	92+	2.4	22 30	−2	66
S δ-Aquariids	Jul. 28 22h	126	8	20	6.2	>23	66+	3.2	22 44	−16	43
Perseids	Aug. 12 13h	140.0	2	90	6.0	✓	43–	2.1	3 08	+58	60
Orionids	Oct. 21 6h	208	2	20	2.2	>23	26+	2.4	6 20	+16	67
S Taurids	Nov. 5 6h	223	15	10	1.0	✓	82–	2.3	3 34	+14	31
N Taurids	Nov. 12 5h	230	15	15	1.4	✓	13–	2.3	4 00	+22	30
Leonids	Nov. 17 12h	235.3	1	20	1.9	>00	7+	2.5	10 12	+22	71
Geminids	Dec. 14 1h	262.2	1	120	11.0	✓	1–	2.3	7 28	+33	36
Ursids	Dec. 22 9h	270.7	0.5	10	2.2	✓	54+	3.0	14 36	+75	35
S D ω-Cetids	May 6 8h	46	20	≈20	—	day	—	—	1 24	–6	36
N D ω-Cetids	May 9 11h	49	30	≈20	—	day	—	—	0 47	+19	36
D ζ-Perseids	Jun. 4 11h	74	19	≈25	—	day	—	—	3 47	+23	29
D Arietids	Jun. 9 4h	78.5	16	≈45	—	day	—	2.1	2 52	+26	41
D β-Taurids	Jun. 25 9h	94	9	≈20	—	day	—	—	5 31	+20	29
D Sextantids	Sep. 28 23h	186	12	≈20	—	day	—	—	10 17	−1	33

The column **Max Date** lists the date and hour (in Universal Time) when Earth intersects the densest part of the stream, based on the solar longitude **λ** (J2000.0) given in the third column.

The fourth column, ***D***, gives the duration of the shower in days, which is the total number of days for which the activity level is over half the maximum activity.

The **ZHR**, or Zenithal Hourly Rate, is given for the peak of the shower. The **θ** column gives the meteoroid flux at the time of maximum (see text for explanation).

The ***R*** column gives the local times for which the radiant is above the horizon for an observer at 45°N latitude (and therefore meteors from the shower are visible); a ✓ symbol indicates that the radiant is up throughout the night hours, while "day" indicates that the shower is not visible at night.

The **Moon** column gives the percent illumination of the Moon at the time of the shower peak (+ for waxing, – for waning). The population index, ***r***, at the time of the maximum is a measure of the size distribution of particles in the stream. A larger *r* value indicates an excess of small particles, while smaller *r* values indicate larger numbers of brighter meteors. A shower with a higher *r* value will therefore suffer more from background light such as moonlight or light pollution. Sporadic meteors at observable visual magnitudes have an *r* value near 3.0.

The **RA** and **Dec** columns show the position in the sky of the radiant at the time of the shower peak. The position of the radiant will vary from these values away from the time of the peak; tables published by IMO in their annual shower calendar provide details of radiant drift. The last column, ***v***, gives the apparent atmospheric speed of the meteors in the shower.