Solar Eclipse Predictions by: Fred Espenak and Chris O'Byrne

Partial Solar Eclipses visible from Cologne, GERMANY

Latitude: 50° 56' 00" N
Longitude: 6° 59' 00" E
Altitude: 0m
Time Zone: 01:00 E (MEZ Winter)

Calendar Date	Eclipse Type	Partial Eclipse Begins	Maximum Eclipse	Sun Alt	Sun Azi	Partial Eclipse Ends	Eclipse Mag.
2021-Jun-10	P	10:22:38	11:24:02	59	149	12:28:47	0.246
2022-Oct-25	P	10:09:37	11:07:16	25	161	12:06:35	0.336
2025-Mar-29	P	11:18:54	12:10:13	42	171	13:02:13	0.315
2026-Aug-12	P	18:18:33	19:12:44	06	286	19:55(s)	0.901
2027-Aug-02	P	09:08:03	10:06:38	45	124	11:07:42	0.521
2028-Jan-26	P	16:38:38	17:08(s)	0(s)	240	17:08(s)	0.356(s)
2029-Jun-12	P	04:22(r)	04:22(r)	0(r)	051	04:31:48	0.091(r)
2030-Jun-01	P	05:20:12	06:19:27	15	074	07:23:40	0.64
2034-Mar-20	P	11:05:15	11:28:58	37	158	11:52:49	0.052
2036-Aug-21	P	18:16:36	19:06:53	04	284	19:36(s)	0.693
2037-Jan-16	P	08:54:43	10:14:37	11	145	11:41:44	0.598
2038-Jan-05	P	14:58:05	15:44:08	06	222	16:27:43	0.174
2038-Jul-02	P	14:31:10	15:12:23	49	242	15:51:59	0.135
2039-Jun-21	P	18:31:13	19:33:49	09	296	20:31:55	0.762
2048-Jun-11	P	13:02:11	14:35:28	53	232	16:00:21	0.732
2050-Nov-14	P	13:31:56	14:59:17	12	219	16:19:14	0.788
2053-Sep-12	P	08:19:47	09:20:11	29	124	10:24:31	0.533
2059-Nov-05	P	07:34(r)	08:40:22	09	128	09:57:45	0.744
2060-Apr-30	P	10:32:40	11:21:55	52	153	12:12:27	0.3
2065-Feb-05	P	09:38:16	11:00:00	19	153	12:25:05	0.805
2066-Jun-22	P	20:15:13	20:45(s)	0(s)	310	20:45(s)	0.46(s)
2069-Apr-21	P	10:07:23	10:55:24	47	145	11:45:11	0.278
2072-Sep-12	P	08:03:35	08:44:05	24	115	09:26:21	0.232
2075-Jul-13	P	04:47:01	05:46:36	09	066	06:50:55	0.836
2076-Nov-26	P	10:57:46	12:13:00	18	178	13:29:38	0.568
2078-May-11	P	19:39:39	20:05(s)	0(s)	300	20:05(s)	0.26(s)

2079-May-01	P	11:02:48	11:57:43	54	167	12:54:05	0.361
2080-Sep-13	P	16:56:16	17:54:46	08	266	18:45(s)	0.828
2081-Sep-03	P	07:39:49	08:41:19	26	112	09:46:36	0.931
2082-Feb-27	P	16:17:20	17:31:40	05	251	18:06(s)	0.816
2087-May-02	P	19:50:08	19:51(s)	0(s)	296	19:51(s)	0.019(s)
2088-Apr-21	P	10:25:06	11:31:49	50	158	12:40:39	0.575
2090-Sep-23	P	17:34:48	18:23(s)	0(s)	270	18:23(s)	0.886(s)
2091-Feb-18	P	09:21:19	10:38:31	22	146	12:00:54	0.527
2092-Feb-07	P	16:30:24	17:30(s)	0(s)	246	17:30(s)	0.593(s)
2093-Jul-23	P	12:04:25	13:42:03	56	208	15:13:48	0.915

A time followed by "(r)" means the event is already in progress at sunrise, while a time followed by "(s)" means the event is still in progress at sunset. In such cases, the times and circumstances given are for sunrise or sunset, respectively.

Negative years are equivalent to the year BC minus 1 year (See: Dating Conventions).

Acknowledgments

The JavaScript Solar Eclipse Explorer is based on the JavaScript Solar Eclipse Calculator created by Chris O'Byrne and Stephen McCann. The original calculator predicts the local circumstances for any single eclipse over the period 1970 to 2039 for a geographic position supplied by the user.

The Eclipse Explorer presented here features drop-down menus for city coordinates and buttons to select any century from -1499 to 3000 (1500 BCE to 3000 CE). It can be used to explore the frequencey and circumstances of all solar eclipses visible from any location on Earth. The Eclipse Explorer was developed by Chris O'Byrne and Fred Espenak.

The Besselian elements and values of ΔT used in JavaScript Solar Eclipse Explorer are the same as those used by *Five Millennium Canon of Solar Eclipses: -1999 to +3000*. For the purposes of calculating eclipse circumstances from a given place, the growing uncertainty in the value of ΔT and the corresponding longitude become unacceptably large outside time period of -1499 to 3000 (1500 BCE to 3000 CE).

Lunar Eclipses from 2022 to 2100 – by Fred Espenak and Jean Meeus
Cologne, GERMANY

Latitude: 50° 56' 00" N
Longitude: 6° 59' 00" E
Altitude: 0m

Time Zone: 01:00 E (MEZ Winter)

Partial and **T**otal Eclipses:

Calendar Date	Ecl. Type	Partial Eclipse Begins	Total Eclipse Begins	Mid. Eclipse	Total Eclipse Ends	Partial Eclipse Ends
2022-May-16	T	03:28	04:29	***05:11***	*05:54*	*06:55*
2023-Oct-28	P	20:35	-	**21:14**	-	21:53
2024-Sep-18	P	03:13	-	**03:44**	-	04:16
2025-Mar-14	T	06:10	*07:26*	***07:59***	*08:31*	*09:48*
2025-Sep-07	T	*17:27*	*18:31*	**19:12**	19:53	20:56
2026-Aug-28	P	03:34	-	**05:13**	-	*06:52*
2028-Jan-12	P	04:45	-	**05:13**	-	05:41
2028-Jul-06	P	*18:09*	-	***19:20***	-	*20:30*
2028-Dec-31	T	*16:08*	17:16	**17:52**	18:28	19:36
2029-Jun-26	T	02:32	03:31	***04:22***	*05:13*	*06:12*
2029-Dec-20	T	21:55	23:15	**23:42**	00:09	01:29
2030-Jun-15	P	*18:21*	-	***19:33***	-	20:45
2032-Oct-18	T	18:24	19:39	**20:02**	20:26	21:40
2033-Apr-14	T	*18:25*	19:48	**20:13**	20:37	22:00
2034-Sep-28	P	03:33	-	**03:46**	-	04:00
2035-Aug-18	P	01:33	-	**02:11**	-	02:49
2036-Feb-11	T	21:31	22:34	**23:12**	23:49	00:53
2036-Aug-07	T	01:56	03:04	**03:51**	04:39	*05:47*
2037-Jan-31	T	*13:22*	*14:28*	***15:00***	*15:32*	*16:39*
2037-Jul-27	P	03:32	-	***05:09***	-	*06:45*
2039-Jun-06	P	*18:23*	-	***19:53***	-	21:23
2039-Nov-30	P	*16:12*	-	**17:55**	-	19:38
2040-Nov-18	T	18:13	19:19	**20:03**	20:47	21:53
2041-May-15	P	01:12	-	**01:42**	-	02:11
2041-Nov-08	P	04:48	-	**05:34**	-	06:19
2043-Sep-19	T	01:07	02:15	**02:50**	03:26	04:33
2044-Mar-13	T	18:53	20:04	**20:37**	21:10	22:22
2046-Jul-17	P	01:07	-	**02:05**	-	03:02

2047-Jan-11	T	00:40	01:50	**02:25**	03:00	04:09
2048-Jan-01	T	06:05	07:24	**07:52**	08:20	*09:40*
2048-Jun-26	P	01:41	-	**03:01**	-	04:21
2050-May-06	T	21:48	23:09	**23:30**	23:52	01:13
2050-Oct-30	T	02:44	04:03	**04:20**	04:37	05:57
2051-Apr-26	T	01:24	02:40	**03:15**	03:50	05:05
2051-Oct-19	T	18:28	19:28	**20:10**	20:52	21:52
2054-Feb-22	T	06:09	07:14	***07:50***	*08:26*	*09:30*
2055-Feb-11	T	22:05	23:12	**23:45**	00:18	01:24
2057-Jun-17	P	02:00	-	**03:25**	-	*04:49*
2057-Dec-10	P	00:10	-	**01:52**	-	03:34
2058-Jun-06	T	*18:27*	*19:25*	***20:14***	21:03	22:01
2058-Nov-30	T	02:24	03:30	**04:14**	04:59	06:05
2061-Apr-04	T	21:07	22:37	**22:52**	23:07	00:37
2062-Mar-25	T	02:46	03:55	**04:32**	05:09	06:18
2062-Sep-18	T	*17:46*	19:02	**19:32**	20:02	21:18
2063-Mar-14	P	*16:43*	-	***17:04***	-	*17:24*
2064-Feb-02	P	22:26	-	**22:47**	-	23:08
2065-Jan-22	T	*09:12*	*10:23*	***10:57***	*11:31*	*12:41*
2065-Jul-17	T	*16:58*	*17:58*	***18:47***	*19:35*	*20:35*
2066-Jan-11	T	*14:15*	*15:34*	***16:03***	*16:32*	17:50
2068-May-17	P	*05:01*	-	***06:40***	-	*08:20*
2069-Oct-30	T	02:50	03:49	**04:33**	05:16	06:16
2070-Oct-19	P	19:08	-	**19:49**	-	20:30
2072-Mar-04	T	*14:41*	*15:47*	***16:21***	*16:55*	*18:00*
2072-Aug-28	T	*15:13*	*16:31*	***17:03***	*17:35*	*18:54*
2073-Feb-22	T	06:43	*07:48*	***08:23***	*08:57*	*10:02*
2073-Aug-17	T	*16:55*	*18:15*	***18:40***	*19:05*	20:26
2075-Dec-22	P	08:12	-	***09:53***	-	*11:35*
2076-Jun-17	T	01:50	02:47	**03:37**	*04:27*	*05:25*
2077-Nov-29	P	21:41	-	**22:33**	-	23:26
2079-Apr-16	P	04:26	-	***06:08***	-	*07:50*
2079-Oct-10	T	*16:49*	18:07	**18:28**	18:49	20:07
2080-Sep-28	T	01:01	02:13	**02:50**	03:27	04:39
2081-Mar-24	P	00:46	-	**01:19**	-	01:53
2082-Feb-13	P	07:14	-	**07:27**	-	07:39

2083-Feb-02	T	17:40	18:51	**19:24**	19:57	21:08
2083-Jul-28	T	00:16	01:18	**02:03**	02:48	03:49
2084-Jan-22	T	22:22	23:40	**00:10**	00:41	01:58
2086-Nov-20	P	19:43	-	**21:17**	-	22:51
2088-Oct-30	P	03:14	-	**04:00**	-	04:47
2090-Mar-15	T	23:07	00:14	**00:46**	01:17	02:24
2090-Sep-08	T	22:03	23:34	**23:49**	00:05	01:36
2091-Mar-05	T	*15:15*	*16:19*	***16:55***	*17:32*	18:36
2091-Aug-28	T	23:47	00:59	**01:35**	02:12	03:24
2094-Jan-01	P	*16:16*	-	**17:57**	-	19:38
2094-Dec-21	T	19:03	20:08	**20:53**	21:39	22:44
2095-Jun-17	P	21:44	-	**22:57**	-	00:11
2095-Dec-11	P	06:17	-	**07:12**	-	08:06
2097-Oct-20	T	00:50	02:20	**02:28**	02:35	04:05
2098-Apr-15	T	*18:14*	*19:17*	**20:01**	20:46	21:49

Events shown in gray ("*kursiv*") occur below the horizon and are not visible.
The calendar date of an eclipse refers to the start of the penumbral eclipse, even if this phase is not visible (i.e., Moon is below the horizon). If an eclipse begins before midnight and ends after midnight, the latter phases occur on the following calendar date.

Negative years are equivalent to the year BC minus 1 year (See: Dating Conventions).