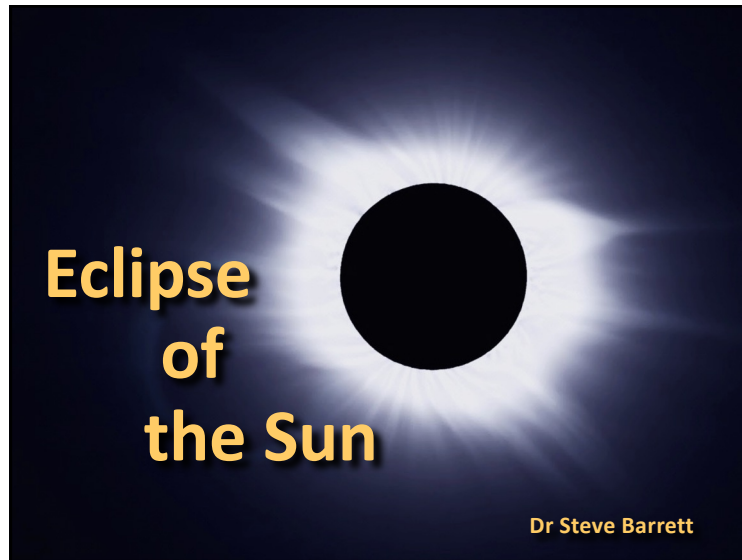


Eclipse of the Sun



Eclipse of the Sun

Eclipses

Why do they happen?
When do they happen?

Total Eclipse in March 2006

Where was it seen?
What was it like?

Future Eclipses

When can I see one?



2

Safety

Remember that you should **NEVER** look at the Sun without using special eclipse glasses like these:



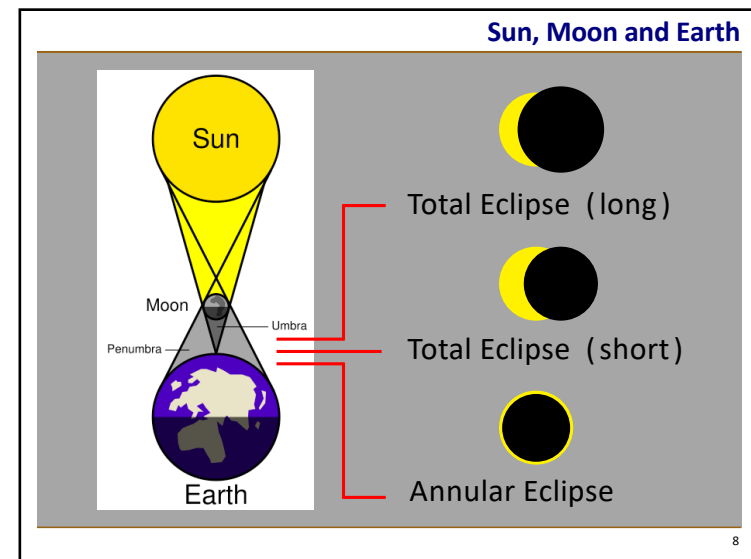
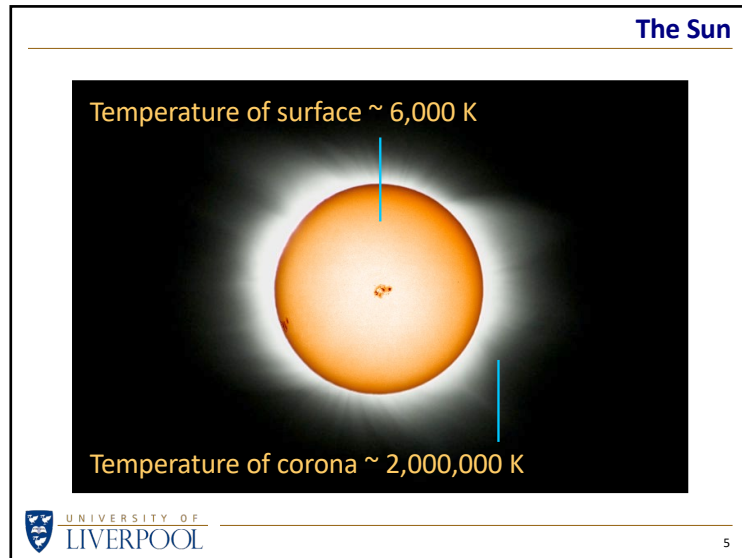
3

Safety



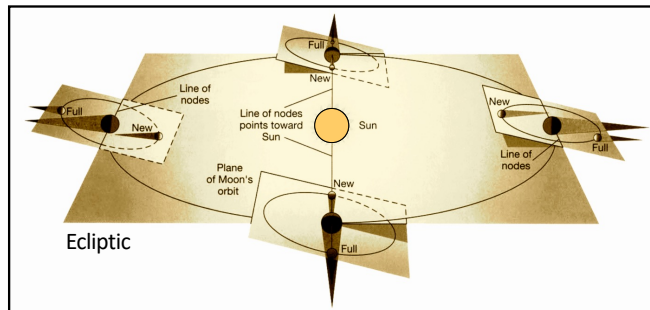
4

Eclipse of the Sun



Eclipse of the Sun

Sun, Moon and Earth



The Moon crosses the plane of the Earth's orbit (the Ecliptic) at a node. When a node is in line with the Sun we can see an eclipse.

How Long is a Month?

Synodic Month

New Moon to New Moon 29.53 days

Draconic Month

Node to Node 27.21 days

Anomalistic Month

Perigee to Perigee 27.55 days

Periods Between Eclipses

223 Synodic months = 6585.32 days

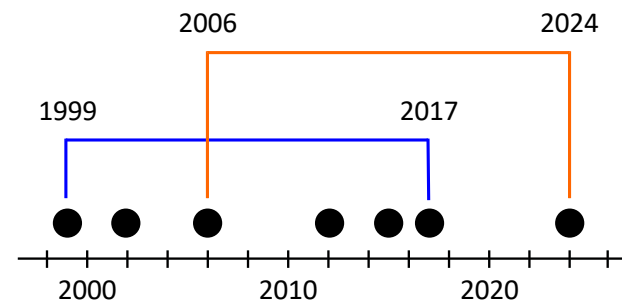
242 Draconic months = 6585.36 days

239 Anomalistic months = 6585.54 days

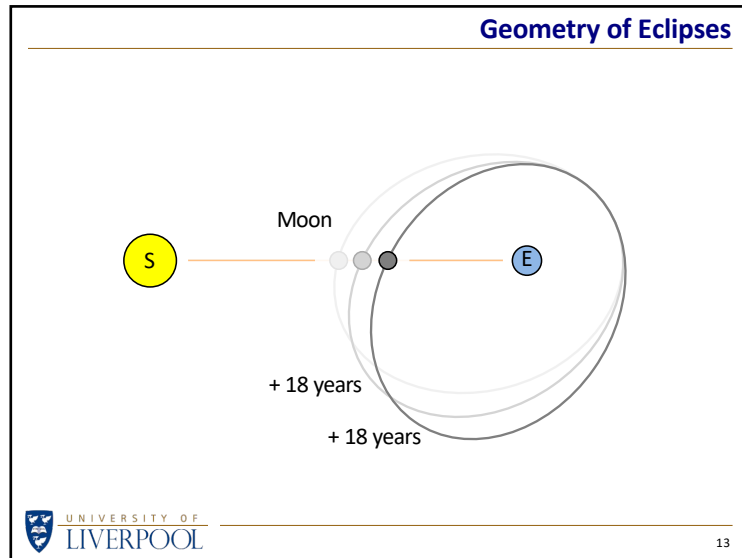
Over this time period, the so-called **saros** cycle, the Moon's orbital periods are back in 'synch'.

Two eclipses separated by one saros cycle have similar geometries and so the eclipses repeat.

Periods Between Eclipses



Eclipse of the Sun



Saros 139

Date	$\phi M / \phi S$	Length	Seen from
1988 Mar 18	1.046	3 ^m 46 ^s	Asia
2006 Mar 29	1.052	4 ^m 07 ^s	Africa
2024 Apr 08	1.057	4 ^m 28 ^s	Americas
2042 Apr 20	1.061	4 ^m 51 ^s	Asia
2060 Apr 30	1.066	5 ^m 15 ^s	Africa
2078 May 11	1.070	5 ^m 40 ^s	Americas
2096 May 22	1.074	6 ^m 06 ^s	Asia

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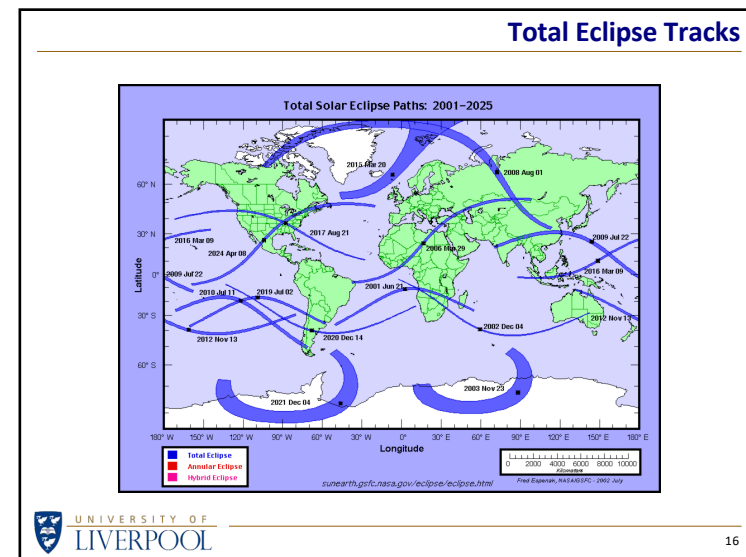
14

Eclipses Coming Soon

Date	$\phi M / \phi S$	Length	Seen from
2019 Jul 02	1.046	4 ^m 33 ^s	S America
2020 Dec 14	1.025	2 ^m 10 ^s	S America
2021 Dec 04	1.037	1 ^m 54 ^s	Antarctica
2023 Apr 20	1.013	1 ^m 16 ^s	Australia
2024 Apr 08	1.057	4 ^m 28 ^s	N America
2026 Aug 12	1.039	2 ^m 18 ^s	W Europe
2027 Aug 02	1.079	6 ^m 23 ^s	S Europe

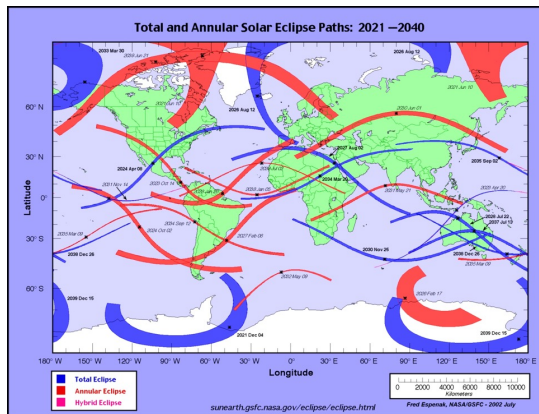
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15



Eclipse of the Sun

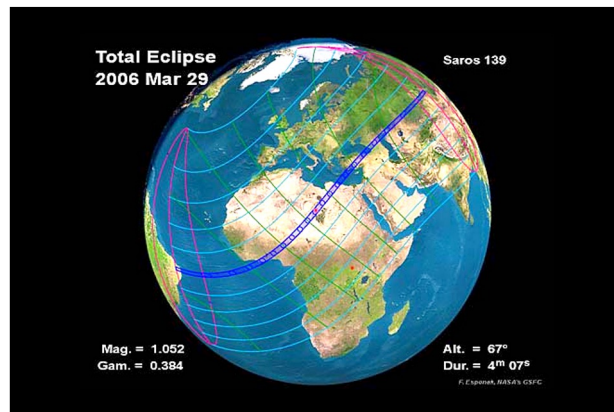
Total Eclipse Tracks



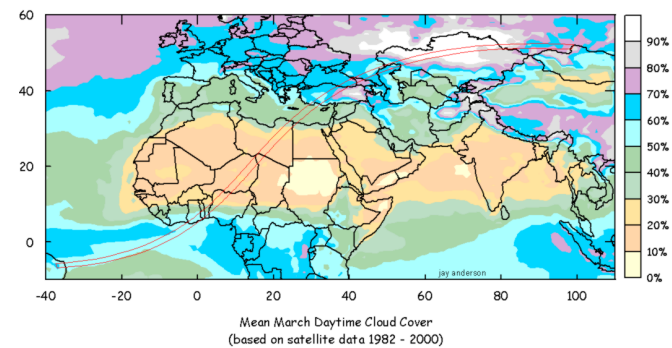
Cornwall 11 Aug 1999



Total Eclipse 2006

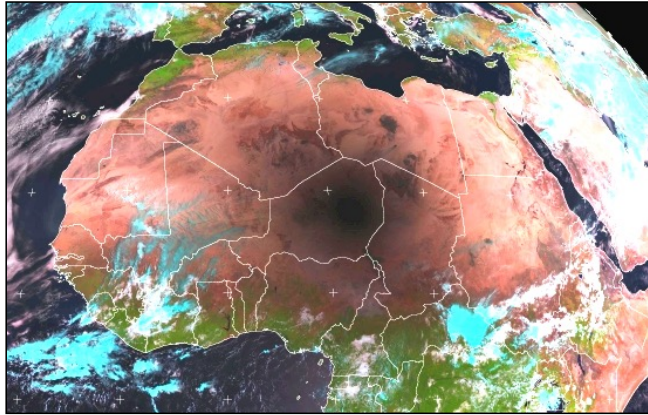


Total Eclipse 2006

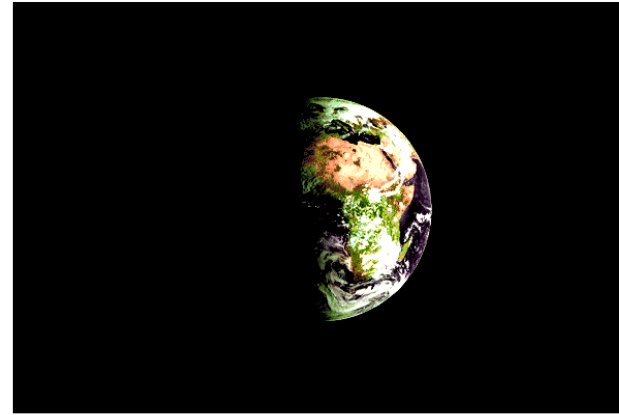


Eclipse of the Sun

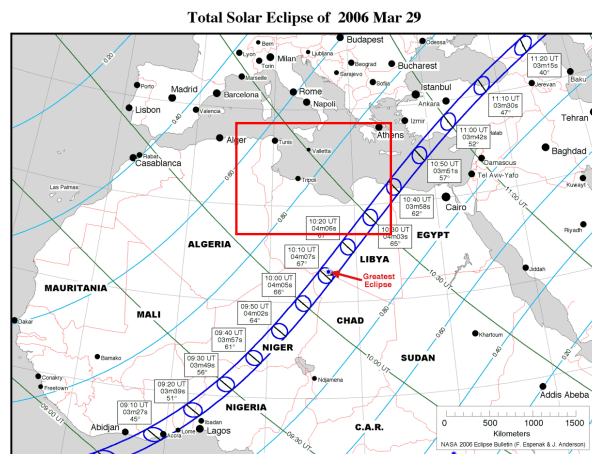
Total Eclipse 2006



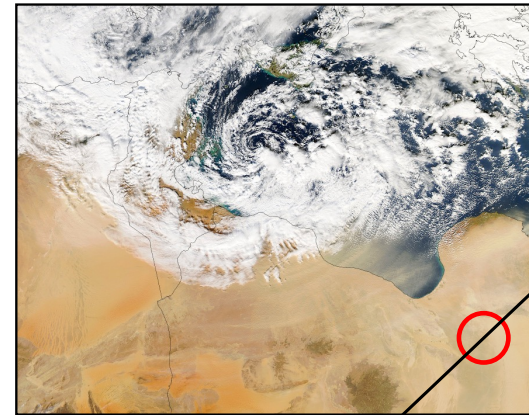
Total Eclipse 2006



Eclipse Track

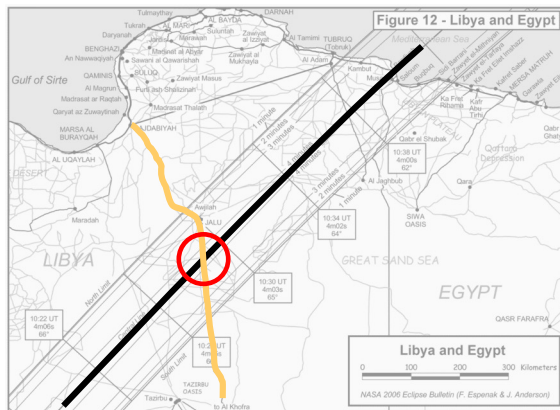


Eclipse Site



Eclipse of the Sun

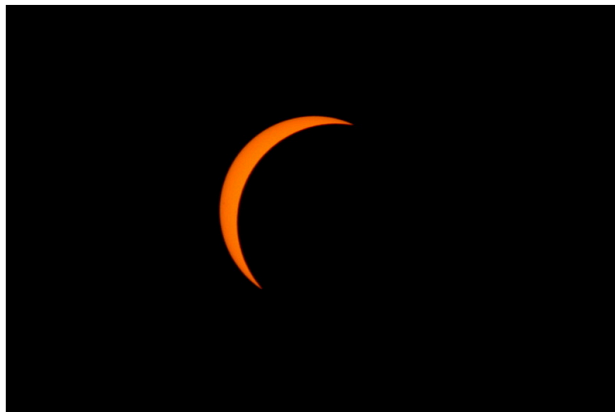
Eclipse Track



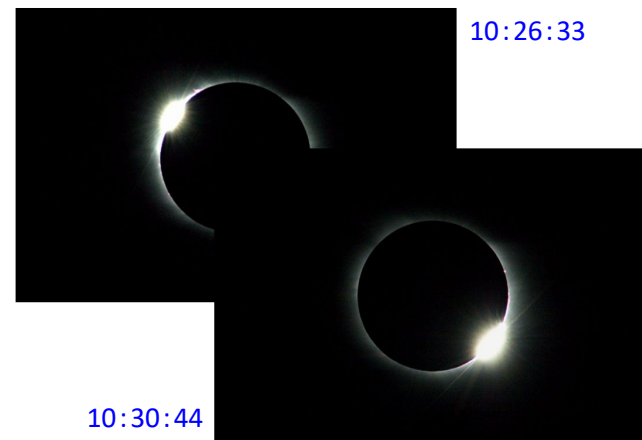
Setting Up in the Desert



... and So It Begins



Totality!



Eclipse of the Sun

Catching the Corona



1/4000 s
1/1000 s
1/250 s
1/60 s
1/15 s
1/4 s

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Viewing Totality



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An African Experience



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Eclipse of the Sun

