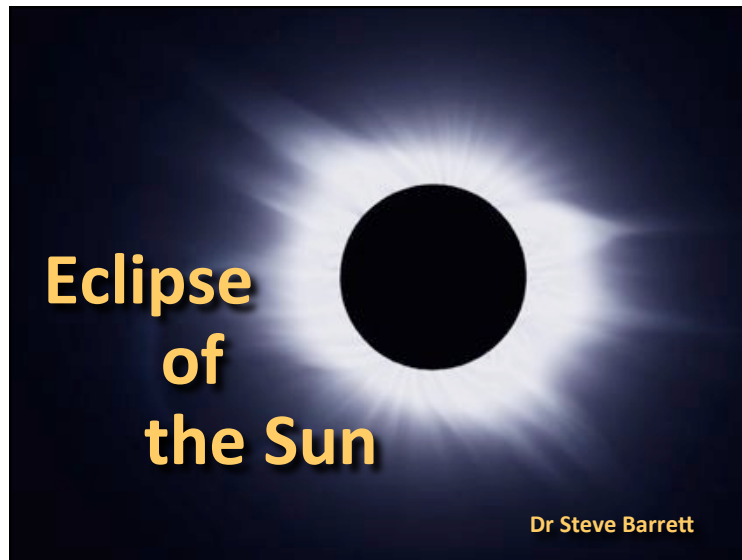


Eclipse of the Sun



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?

Safety

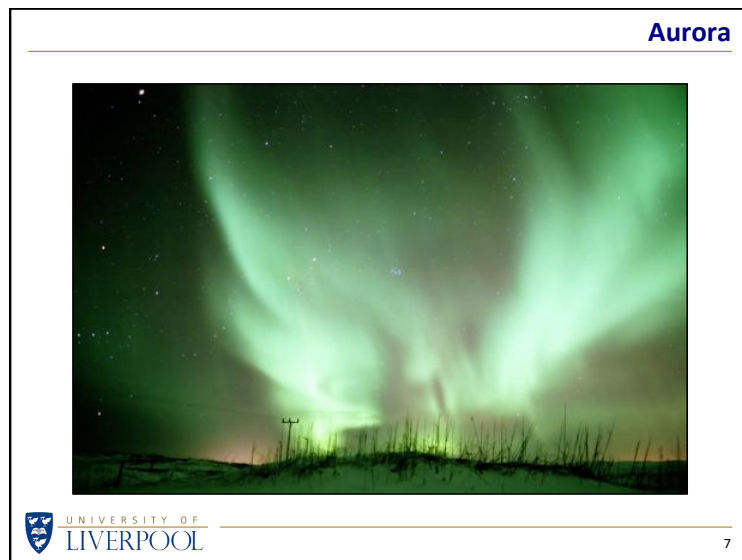
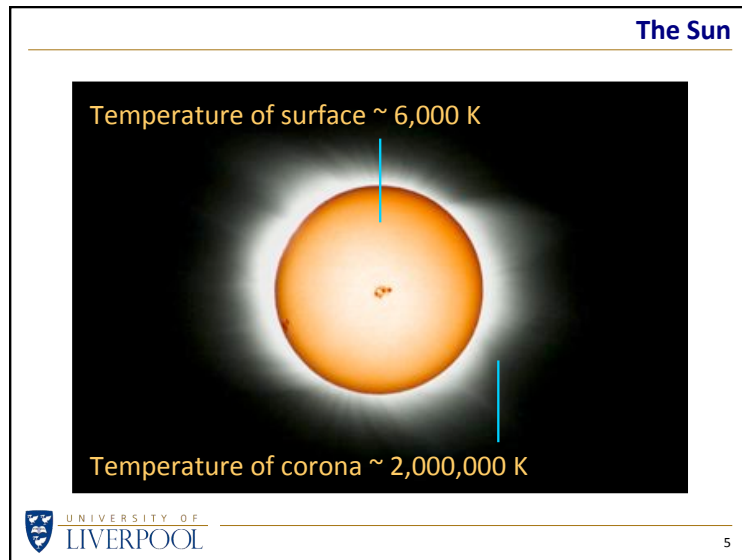
Remember that you should **NEVER** look at the Sun without using special eclipse glasses like these:



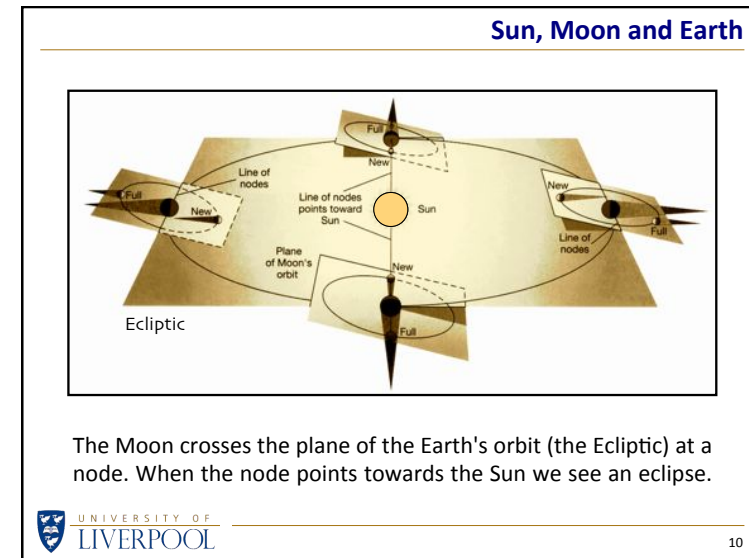
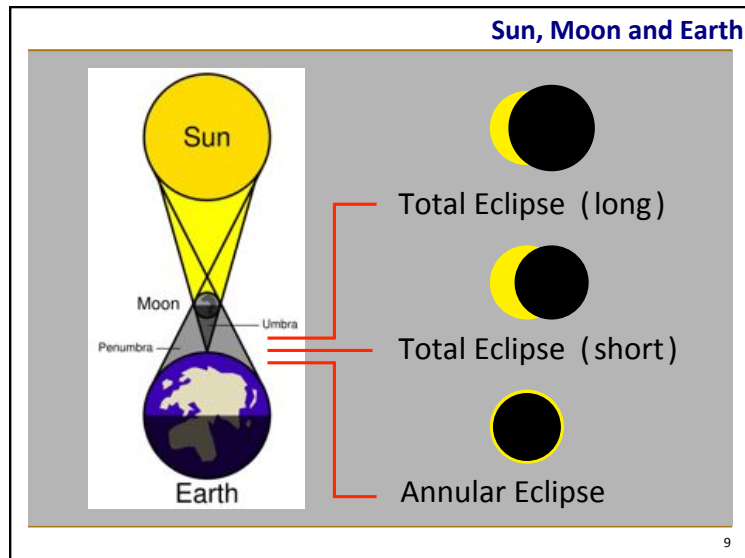
Safety



Eclipse of the Sun



Eclipse of the Sun



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

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Periods Between Eclipses

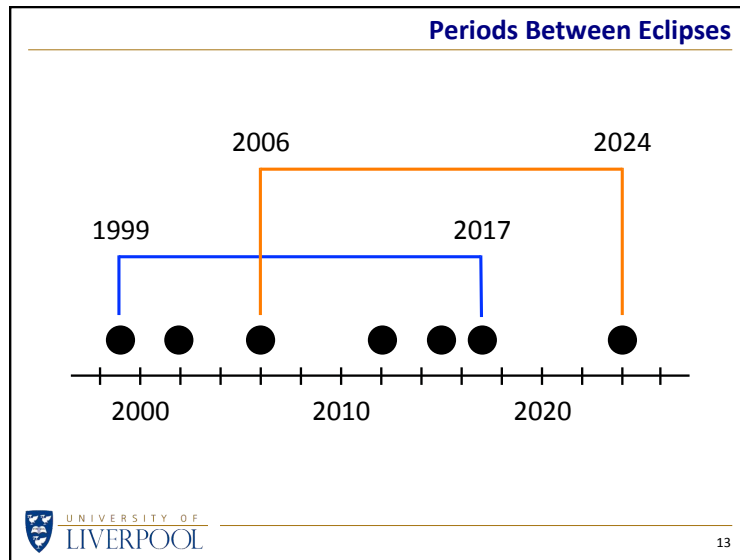
223 Synodic months	=	6585.32 days
242 Draconic months	=	6585.36 days
239 Anomalistic months	=	6585.54 days

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.

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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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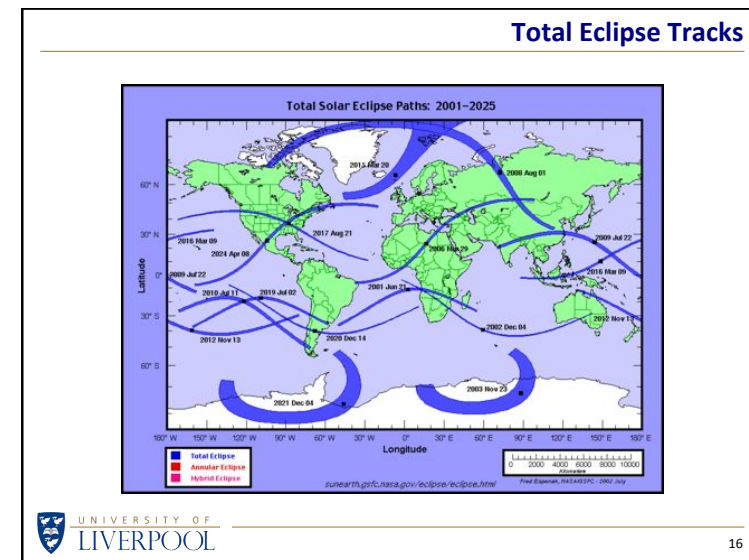
14

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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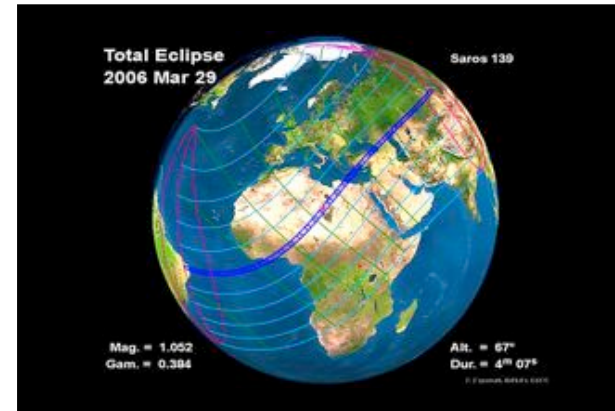


Eclipse of the Sun

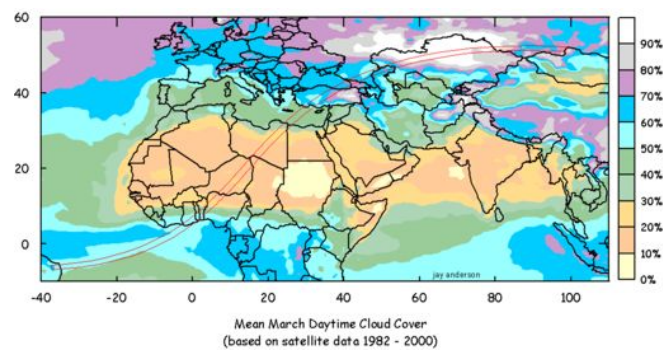
Cornwall 11 Aug 1999



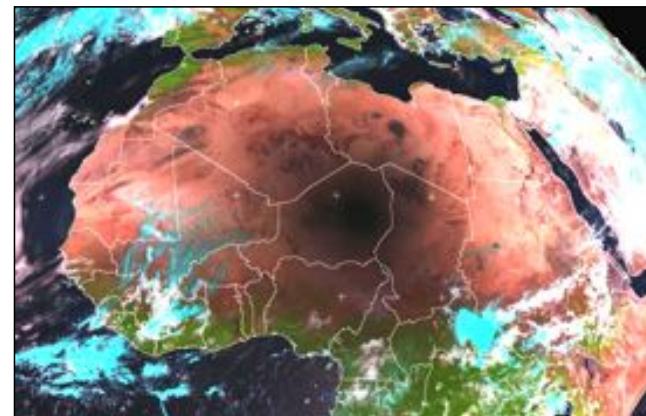
Total Eclipse 2006



Total Eclipse 2006



Total Eclipse 2006

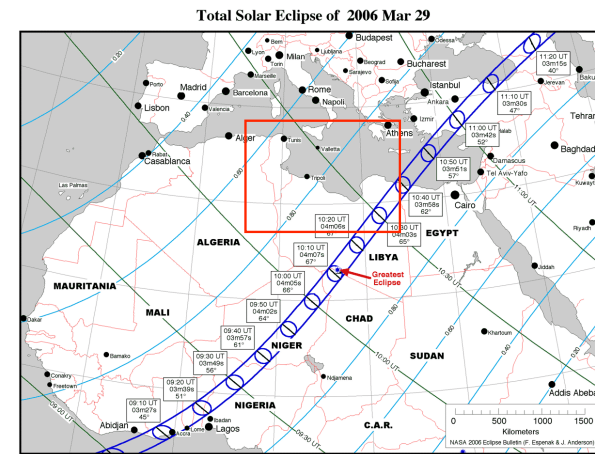


Eclipse of the Sun

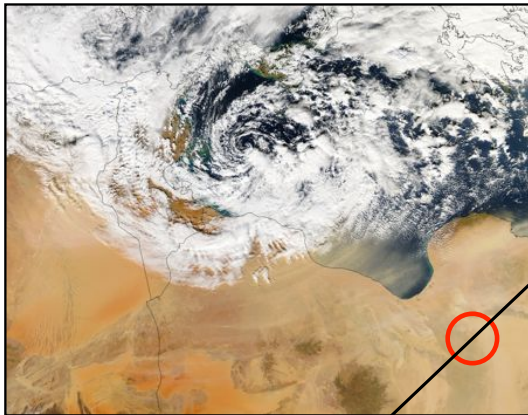
Total Eclipse 2006



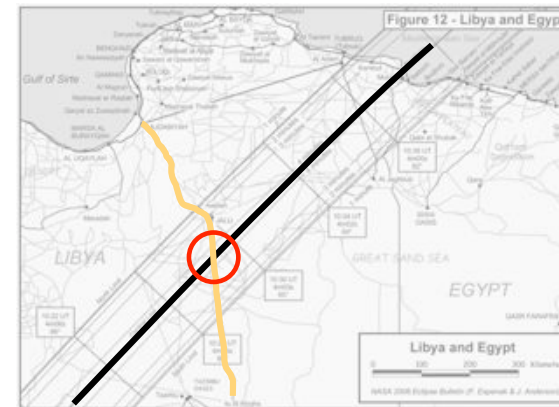
Eclipse Track



Eclipse Site



Eclipse Track

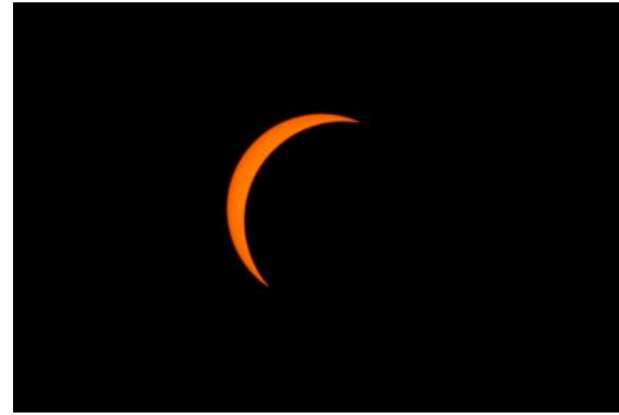


Eclipse of the Sun

Setting Up in the Desert



... and So It Begins



Totality!



Catching the Corona



1/4000 s

1/1000 s

1/250 s

1/60 s

1/15 s

1/4 s

Eclipse of the Sun



Viewing Totality



An African Experience



www.liverpool.ac.uk/~sdb/Talks

Dr Steve Barrett

21 Jan 2019