

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?

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Safety

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

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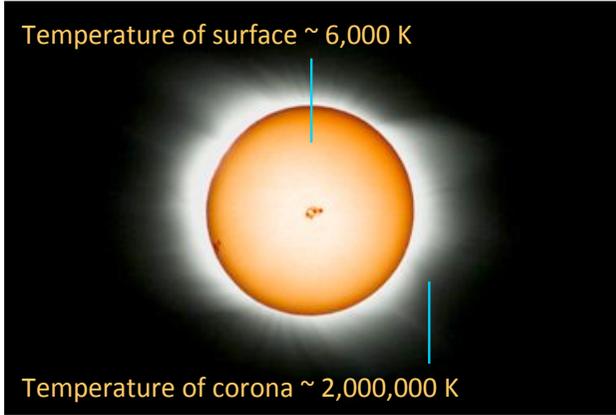
Safety

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Eclipse of the Sun

The Sun



Temperature of surface $\sim 6,000$ K

Temperature of corona $\sim 2,000,000$ K

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Detailed description: A diagram of the Sun as a bright orange sphere against a black background. A thin white ring, representing the corona, surrounds the sphere. Two blue lines with arrows point from text labels to the surface and the corona respectively.

Aurora



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Detailed description: A photograph showing a vibrant green aurora borealis in a dark night sky. The aurora appears as flowing, ethereal curtains of light. The foreground shows a dark, silty landscape with some sparse vegetation.

Aurora



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Detailed description: A photograph showing a vibrant green aurora borealis in a dark night sky. The aurora appears as flowing, ethereal curtains of light. The foreground shows a dark, silty landscape with some sparse vegetation.

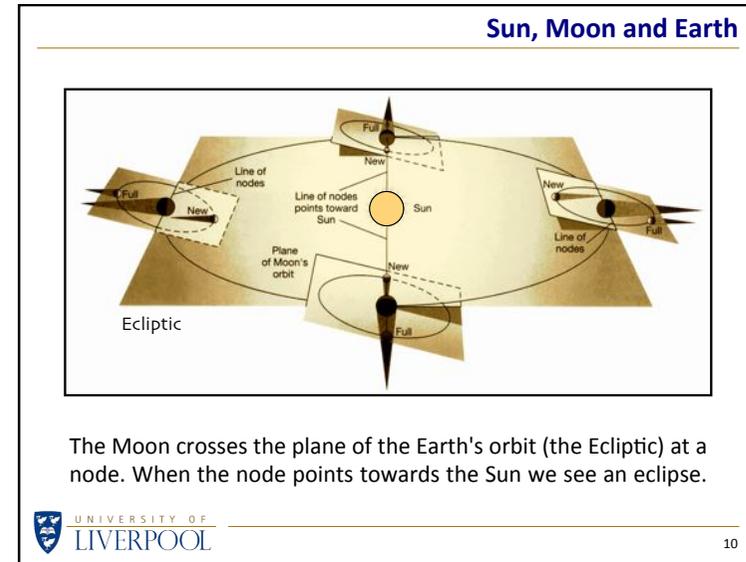
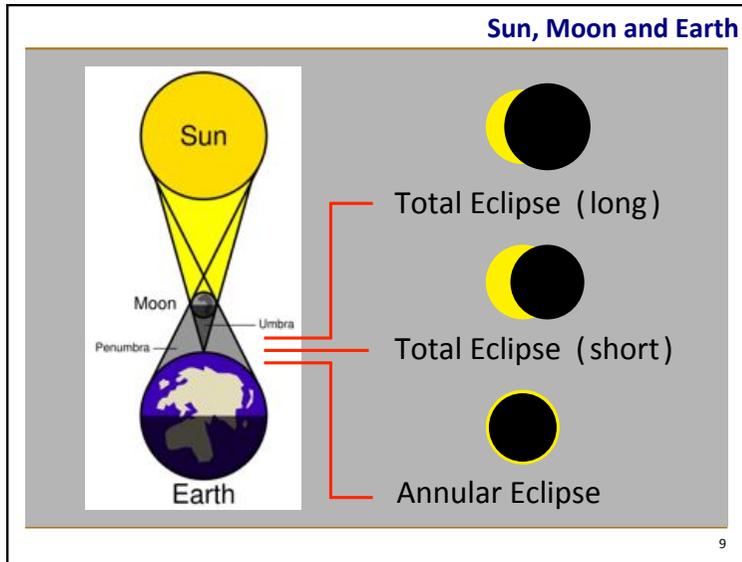


Our closest neighbour can be fascinating ...

... watching the shadows of the craters and mountains change from night to night

Detailed description: A photograph of the Moon, showing its heavily cratered surface. The lighting creates deep shadows in the craters and highlights the rugged terrain. The text is overlaid on the left side of the image.

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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

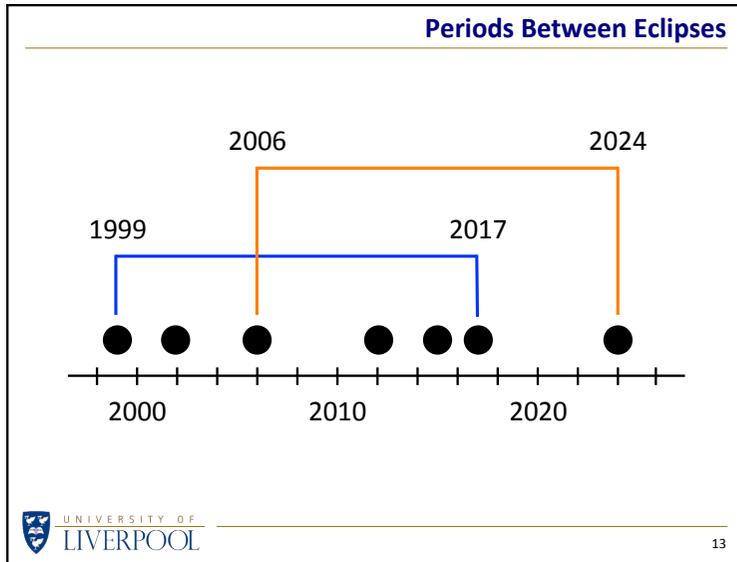
Over this time period, the so-called **saros** cycle, the Moon's orbital periods are back in 'synch'.

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

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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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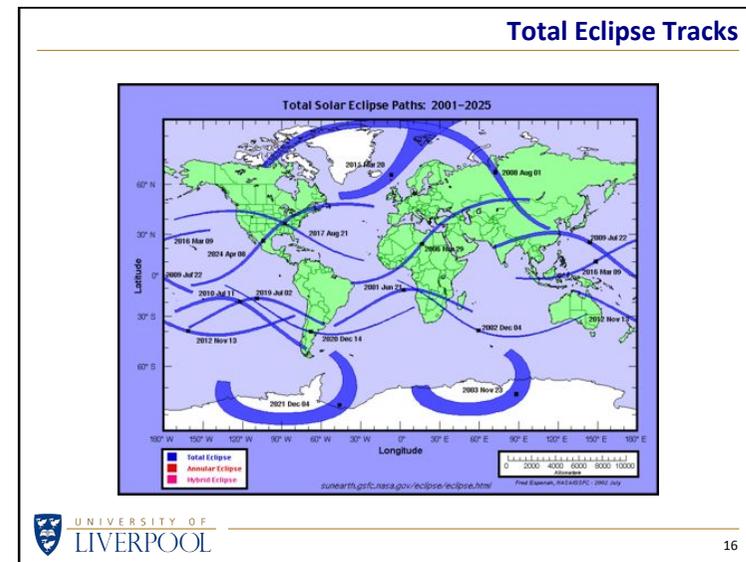
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Eclipses Coming Soon

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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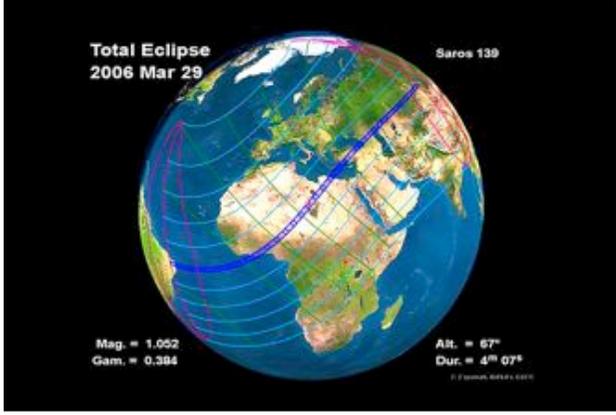
Cornwall 11 Aug 1999



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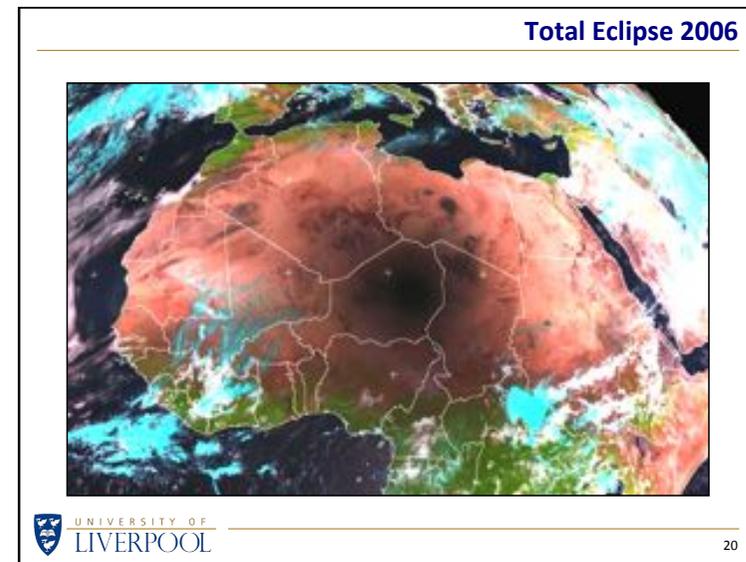
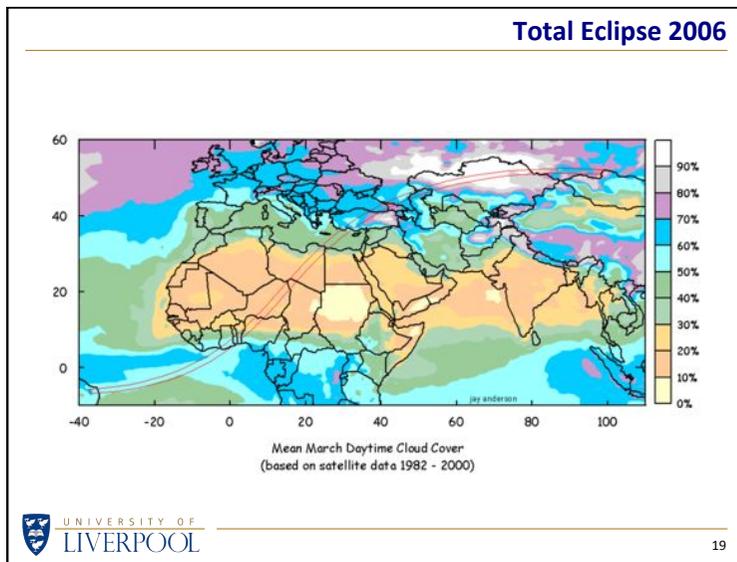
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Total Eclipse 2006



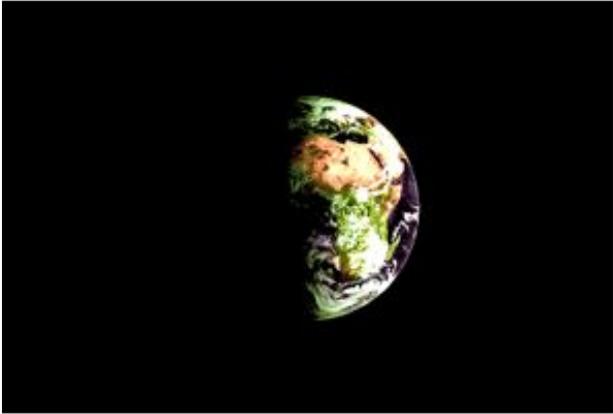
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Total Eclipse 2006

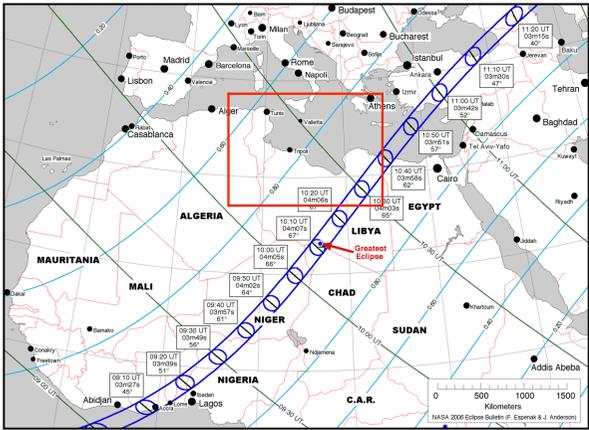


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Eclipse Track

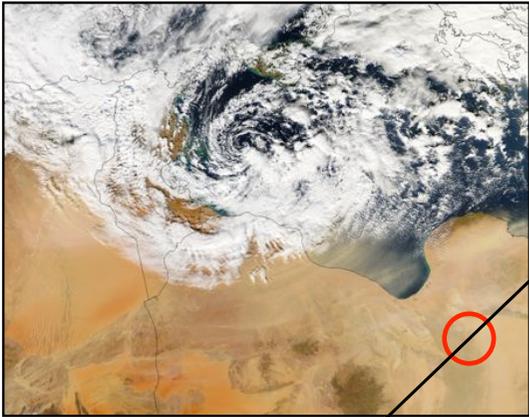
Total Solar Eclipse of 2006 Mar 29



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Eclipse Site

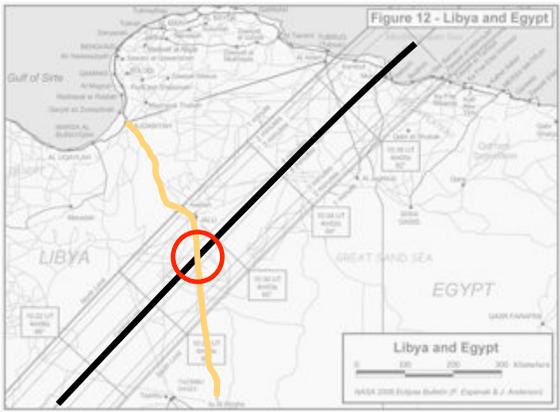


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Eclipse Track

Figure 12 - Libya and Egypt



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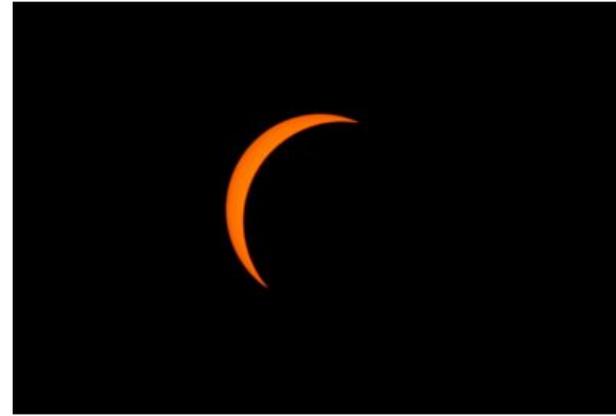
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Setting Up in the Desert



... 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

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Viewing Totality

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An African Experience

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Dr Steve Barrett

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