On Wednesday, 29 March 2006, a total eclipse of the Sun will be visible from within a narrow corridor which traverses half the Earth. Northwestern Egypt also lies within the umbral (total shadow) path where the central duration is 3 minutes 58 seconds. The path of the Moon's umbral shadow begins in Brazil and extends across the Atlantic, northern Africa, and central Asia where it ends at sunset in western Mongolia. A partial eclipse will be seen within the much broader path of the Moon's penumbral shadow, which includes the northern two thirds of Africa, Europe, and central Asia.\(^1\)

**What Does Eclipse Mean?**

Eclipses are natural phenomena, which occur when three celestial objects become aligned, so that a celestial body is completely or partially obscured by another.

**Eclipse Types**

*Solar eclipse* happens when the Moon moves directly into the path between the Sun and the Earth, *Lunar eclipse* happens when the Earth moves directly into the path between the Sun and the Moon.

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The following diagram shows a side view of the alignment in case of a solar eclipse:

![Diagram of solar eclipse alignment](image)

There are two types of solar eclipses: total and partial eclipses:

![Diagram of solar eclipse phases](image)

Of these two, partial eclipses are much more common because the path of a total solar eclipse covers only a few kilometers and much of the time the shadow of the total eclipse does not even touch the Earth. In these instances we still see a partial eclipse, but we see none of the features of the total eclipse that make it a truly spectacular event.

Occasionally, when the Moon is far enough away from the Earth in its orbit and its apparent size is small enough, the Moon can pass directly in front of the Sun and not cause a total solar eclipse. This is called an *annular eclipse*, and has the same features as a partial eclipse, except that the light from the Sun comes in the form of a ring (annular means ring in Latin) rather than part of a circle as in a partial eclipse.

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Safe Solar Eclipse Observing

The only time that the Sun can be viewed safely with the naked eye is during a total eclipse, when the Moon completely covers the disk of the Sun. **It is never safe to look** at a partial or annular eclipse, or the partial phases of a total solar eclipse, without the proper equipment and techniques, the result can damage the eyes.

The Sun can only be viewed directly when filters specially designed to protect the eyes are used.⁵ Extreme caution should be exercised when viewing the sun. Always consult an expert!

**Quick Basic Facts on:**

**Earth's Moon (Luna)⁶**

- Distance from Earth: 384,400 km
- Equatorial Radius: 1737.4 km
- Volume: 21,970,000 km³
- Mass: 73,483,000,000,000,000,000,000 kg

**Earth⁷**

- Distance from the Sun: 149,597,890 km
- Equatorial Radius: 6,378.14 km
- Volume: 1,083,200,000,000 km³
- Mass: 5,973,700,000,000,000,000,000 kg

**The Sun⁸**

- Distance from Earth: 149,597,900 km
- Equatorial Radius: 695,500 km
- Volume: 1,142,200,000,000,000,000 km³
- Mass: 1,989,000,000,000,000,000,000,000 kg

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Solar Eclipses: 2001 - 2010

The table below lists every solar eclipse from 2001 through 2010:

*Geographic abbreviations: n = north, s = south, e = east, w = west, c = central*

<table>
<thead>
<tr>
<th>Date</th>
<th>Eclipse Type</th>
<th>Eclipse Magnitude</th>
<th>Central Duration</th>
<th>Geographic Region of Eclipse Visibility</th>
</tr>
</thead>
<tbody>
<tr>
<td>2001 Jun 21</td>
<td>Total</td>
<td>1.050</td>
<td>04m57s</td>
<td>e S. America, Africa [Total: s Atlantic, s Africa, Madagascar]</td>
</tr>
<tr>
<td>2001 Dec 14</td>
<td>Annular</td>
<td>0.968</td>
<td>03m53s</td>
<td>N. &amp; C. America, nw S. America [Annular: c Pacific, Costa Rica]</td>
</tr>
<tr>
<td>2002 Jun 10</td>
<td>Annular</td>
<td>0.996</td>
<td>00m23s</td>
<td>e Asia, Australia, w N. America [Annular: n Pacific, w Mexico]</td>
</tr>
<tr>
<td>2002 Dec 04</td>
<td>Total</td>
<td>1.024</td>
<td>02m04s</td>
<td>s Africa, Antarctica, Indonesia, Australia [Total: s Africa, s Indian, s Australia]</td>
</tr>
<tr>
<td>2003 May 31</td>
<td>Annular</td>
<td>0.938</td>
<td>03m37s</td>
<td>Europe, Asia, nw N. America [Annular: Iceland, Greenland]</td>
</tr>
<tr>
<td>2003 Nov 23</td>
<td>Total</td>
<td>1.038</td>
<td>01m57s</td>
<td>Australia, N. Z., Antarctica, s S. America [Total: Antarctica]</td>
</tr>
<tr>
<td>2004 Apr 19</td>
<td>Partial</td>
<td>0.736</td>
<td>-</td>
<td>Antarctica, s Africa</td>
</tr>
<tr>
<td>2004 Oct 14</td>
<td>Partial</td>
<td>0.927</td>
<td>-</td>
<td>ne Asia, Hawaii, Alaska</td>
</tr>
<tr>
<td>2005 Apr 08</td>
<td>Hybrid</td>
<td>1.007</td>
<td>00m42s</td>
<td>N. Zealand, N. &amp; S. America [Hybrid: s Pacific, Panama, Colombia, Venezuela]</td>
</tr>
<tr>
<td>2005 Oct 03</td>
<td>Annular</td>
<td>0.958</td>
<td>04m32s</td>
<td>Europe, Africa, s Asia [Annular: Portugal, Spain, Libia, Sudan, Kenya]</td>
</tr>
<tr>
<td>2006 Mar 29</td>
<td>Total</td>
<td>1.052</td>
<td>04m07s</td>
<td>Africa, Europe, w Asia [Total: c Africa, Turkey, Russia]</td>
</tr>
<tr>
<td>2006 Sep 22</td>
<td>Annular</td>
<td>0.935</td>
<td>07m09s</td>
<td>S. America, w Africa, Antarctica [Annular: Guyana, Suriname, F. Guiana, s Atlantic]</td>
</tr>
<tr>
<td>2007 Mar 19</td>
<td>Partial</td>
<td>0.874</td>
<td>-</td>
<td>Asia, Alaska</td>
</tr>
<tr>
<td>2007 Sep 11</td>
<td>Partial</td>
<td>0.749</td>
<td>-</td>
<td>S. America, Antarctica</td>
</tr>
<tr>
<td>2008 Feb 07</td>
<td>Annular</td>
<td>0.965</td>
<td>02m12s</td>
<td>Antarctica, e Australia, N. Zealand [Annular: Antarctica]</td>
</tr>
<tr>
<td>2008 Aug 01</td>
<td>Total</td>
<td>1.039</td>
<td>02m27s</td>
<td>ne N. America, Europe, Asia [Total: n Canada, Greenland, Siberia, Mongolia, China]</td>
</tr>
<tr>
<td>2009 Jan 26</td>
<td>Annular</td>
<td>0.928</td>
<td>07m54s</td>
<td>s Africa, Antarctica, se Asia, Australia [Annular: s Indian, Sumatra, Borneo]</td>
</tr>
<tr>
<td>2009 Jul 22</td>
<td>Total</td>
<td>1.080</td>
<td>06m39s</td>
<td>e Asia, Pacific Ocean, Hawaii [Total: India, Nepal, China, c Pacific]</td>
</tr>
<tr>
<td>2010 Jan 15</td>
<td>Annular</td>
<td>0.919</td>
<td>11m08s</td>
<td>Africa, Asia [Annular: c Africa, India, Malymar, China]</td>
</tr>
<tr>
<td>2010 Jul 11</td>
<td>Total</td>
<td>1.058</td>
<td>05m20s</td>
<td>s S. America [Total: s Pacific, Easter Is., Chile, Argentina]</td>
</tr>
</tbody>
</table>

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Selected Materials on Eclipses
Available at the Bibliotheca Alexandrina

Books

BA Call Number: 523.2  (B1)

BA Call Number: 523.2  (B1)

BA Call Number: 520  (B1)

BA Call Number: 509 (B1)

BA Call Number: 523.78  (B1)

BA Call Number: 523.3809520  (B1)

BA Call Number: 523.20223 Y459  (B1)

BA Call Number: 523  (B1)

BA Call Number: 523.99  (B1)

BA Call Number: 520  (B1)
E-Books


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“Eclipse”. In Encyclopedia Britannica Online, academic ed. Source: http://www.search.eb.com/eb/article-9106197?tocId=9106197

Moore, Patrick, ed. The Astronomy Encyclopedia. London: M. Beazley, 1987. BA Call Number: Ref 520.03 I61217 1987 (B4 -- References)


Manuscripts

ابن النجم، أبو علي محمد بن الحسن المصري. رسالة في كيفية الرصد. [9 هـ]. مكتبة الإسكندرية. BA Call Number: 3688/ج فلك (B1 -- Manuscripts)

رسالة في حساب خسوف القمر. 1336 هـ. مكتبة الإسكندرية. BA Call Number: 4629/د فلك (B1 -- Manuscripts)

رسالة في كسوف رمضان. [11 هـ]. مكتبة الإسكندرية. BA Call Number: 5244/ج فلك (B1 -- Manuscripts)
Audiovisual Materials

BA Call Number: CDR 402 (B3 -- Arts & Multimedia Library)

Electronic Articles

“Egypt: Solar Eclipse Results in 300 Injuries”. IPR Strategic Business Information Database (16 August 1999).
Source: InfoTrac OneFile (Database)

“Motion Picture of the Total Eclipse of the Sun”. Science, New Series 57, no. 1484 (June 1923): 656.
Source: JSTOR (Database)

Source: Academic Search Premier (Database)

Source: JSTOR (Database)
Web Resources

MrEclipse.com: The Ultimate Resource for Eclipse Photography.
http://www.mreclipse.com/MrEclipse.html  [accessed 31 January 2007]
This website contains a summary of the phenomenon, photographs of both solar and lunar eclipses, as well as photographs of comets, galaxies, constellations and the night sky. It also features detailed instructions on how to photograph eclipses, tips for eclipse watching and eye safety, and information about upcoming solar eclipses.

http://www.exploratorium.edu/eclipse/  [accessed 31 January 2007]
Presented by The Exploratorium as part of NASA's Sun-Earth Education Forum, this very interesting web page includes the legend of the sun and the total solar eclipse, maps, and other resources.

Launched by the Bibliotheca Alexandrina on the occasion of the solar eclipse festivity on 29 March 2006. This web site contains information about solar eclipses with images, news and library resources.

Comprehensive coverage of solar and lunar eclipses in the period from 1501 to 2100.

A resourceful website that provides extensive and comprehensive detailed information about all solar and lunar eclipses from 2004 through 2007 and a table listing every solar eclipse from 2001 through 2010, as well as world maps of solar eclipse paths and links to similar web pages.

ظاهرة كسوف الشمس و خسوف القمر. جمعية الفلك بالقطيف.
A website by the Qatif Astronomy Society illustrating the phases of solar and lunar eclipses with the aid of maps and pictures.
Materials for Children and Young People

BA Call Number: YP 520 M8211

BA Call Number: Ch 523.7 M8211 (F1 -- Children’s Library)

Ch 523 L213 (F1 -- Children’s Library)

BA Call Number: Ch 039.927 M462 2000 (F1 -- Children’s Library)

Ch 039.927 M462 2000 (F1 -- Children’s Library)