

A solar eclipse was visible from all of Australia on the afternoon or early evening of Tuesday, February 16, 1999. Such an event occurs when the Moon, in its orbit around Earth, passes between us and the Sun, blocking the Sun's light. It did not 'get dark', because from nowhere did the Moon completely cover the Sun. *It is very important never to look at the Sun, as direct observation of even a small part of the Sun's disc - eclipse or no eclipse - can result in serious eye damage.* However, using the well-known 'pinhole' method, the event could be enjoyed in safety by watching an image of the eclipsed Sun.

The greatest proportion of the Sun's diameter covered by the Moon was somewhere between about 40% and 99%, depending on the place of observation. Over most of the country, the effect of the drop in light was barely noticeable, as the eyes gradually adjusted to the change.

During this eclipse, the Moon's apparent size was slightly smaller than the Sun's. This eclipse is therefore called annular (not to be confused with the word annual, meaning yearly) because, even though from some parts of Australia the Moon passed centrally across the Sun's face, a thin ring of Sun briefly surrounded the Moon's silhouette at the height of the eclipse (the word annular comes from the Latin annulus, meaning ring). Although the overall duration of the eclipse was about two hours (depending on the location), the ring effect lasted for only about one minute from a given place and was seen only from a narrow path crossing the country from just south of Geraldton in Western Australia to just south of Cooktown in Queensland. As it entered Western Australia, the path was about 42 km wide, but by the time it left the Queensland coast it was about 80 km wide. Along and near this path, the light level on the ground seemed quite dull, but by no means dark.

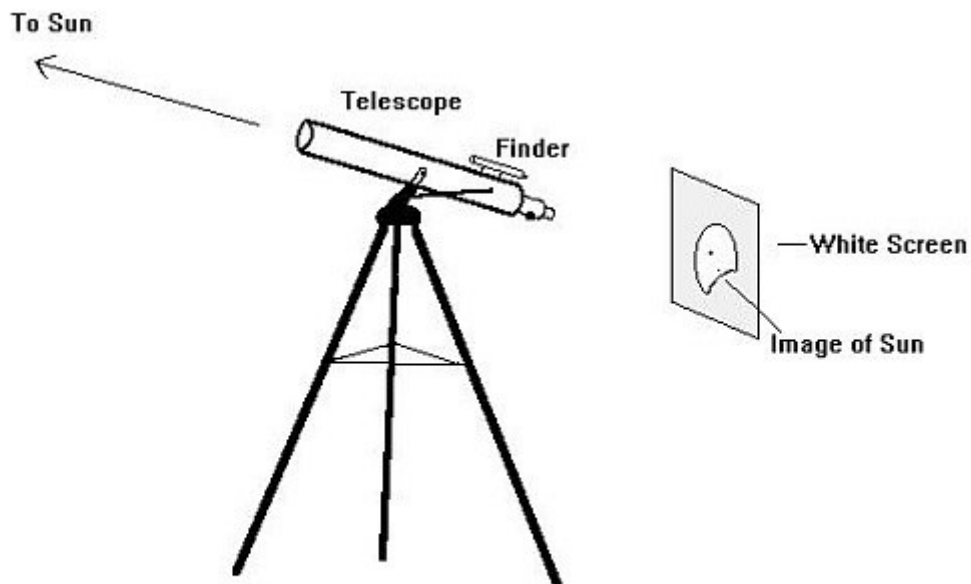
Outside the annular path, all of Australia witnessed what is called a partial solar eclipse, with only part of the silhouette of the Moon appearing in front of the Sun and making the Sun appear either as a crescent shape or as if a smaller 'bite' had been taken from it.

Partial solar eclipses occur every few years from any given place on Earth, but total eclipses (when the Sun is completely covered for a brief time) and annular eclipses, such as this one, are rare from a given place because they are visible only from a narrow path at most a few hundred kilometres wide. The most recent annular solar eclipse to be seen from Australia was on January 16, 1991, from Tasmania and Western Australia, and the next will be seen on May 10, 2013, from parts of Western Australia, the Northern Territory and Queensland. The 2nd most recent total solar eclipse visible from Australia was on October 23, 1976, seen from parts of South Australia, Victoria and New South Wales, and the most recent was a very brief one on December 4, 2002, where the choice observing sites were Ceduna in South Australia and along a line to its north east.

Observing the eclipse in safety

It is important not to look at the Sun through home-made filters or any other devices that seem safe: dangerous solar radiation can still get through unknown to the observer until it is much too late. However, there are ways in which the eclipse can be observed in safety, by projecting the Sun's image and looking at that instead.

An easy way to project the Sun's image is to use a 'pinhole' method: punch a hole about two millimetres across in a piece of card and hold a white card held about a metre behind it. With your back to the Sun, aim the pair so that sunlight passes through the hole onto the second card. In this way, an image of the eclipsed Sun is visible! This is a device called a 'camera obscura'.



**How to use a telescope to project an image of the Sun.
NEVER look through the telescope or its finder!**

It is also possible to use a small telescope to project the image, but at no time should anyone look through it, or through its little finderscope! Aim the telescope towards the Sun and hold a white card behind the eyepiece, as shown in the diagram. The image of the eclipsed Sun can be focused on the card, and sunspots may also be visible. It's a lot of fun, and the image can even be photographed. Using this method, though, the telescope must never be left unattended, and children must be supervised at all times.

TABLES OF ECLIPSE TIMES

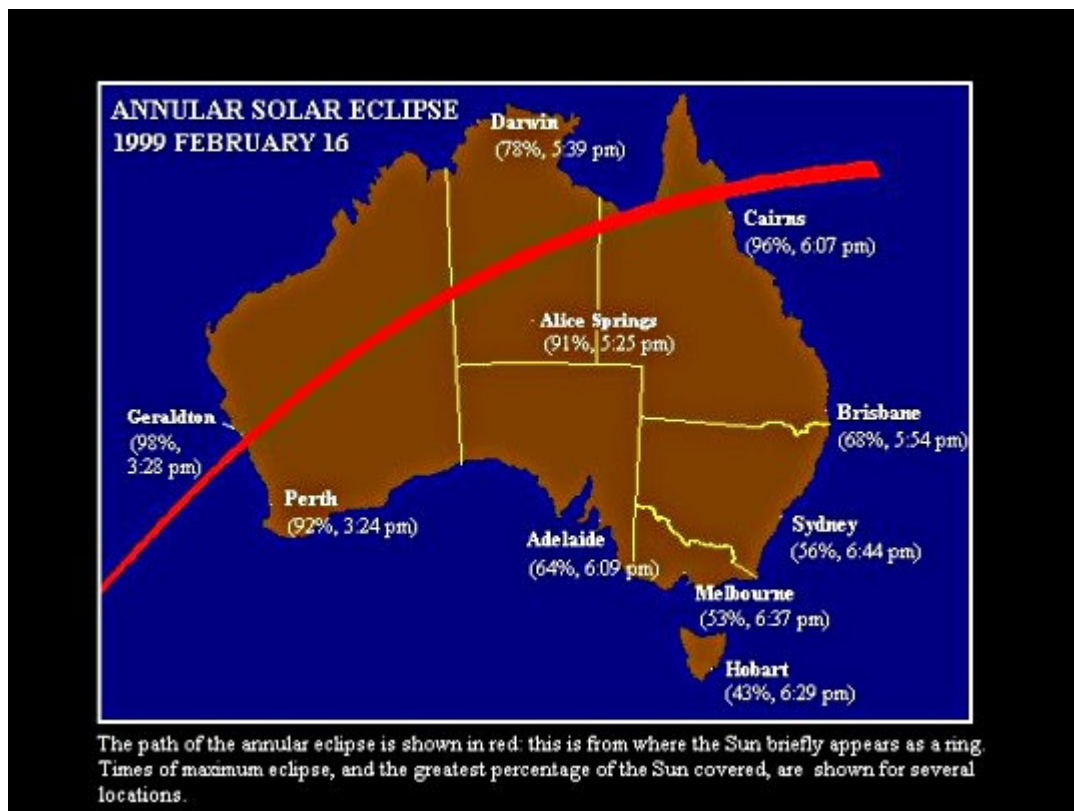
Following are the times of the eclipse in LOCAL TIME for some Australian centres. Summer time has been added where applicable (i.e. in the ACT, New South Wales, South Australia, Tasmania and Victoria).

	Start h m	Middle h m	End h m	% Coverage
Alice Springs	16:12	17:25	18:29	91
Adelaide	17:03	18:09	19:09	64
Barrow Creek (NT)	16:15	17:28	18:32	96
Brisbane	16:54	17:54	-	68
Cairns	17:02	18:07	-	96
Canberra	17:43	18:42	19:36	55
Darwin	16:27	17:39	18:42	78
Geraldton	14:01	15:28	16:45	99
Hobart	17:33	18:29	19:20	43
Melbourne	17:36	18:37	19:32	53
Perth	13:58	15:24	16:40	92
Sydney	17:46	18:44	19:38	56

The percentage coverage is percentage of the Sun's diameter that is covered by the Moon.

Geraldton (WA) was about 20km north of the edge of the path of annularity. In Brisbane and Cairns, the Sun set while the eclipse was still in progress (at 18:33 and 18:50,

respectively).



The following towns lay in the path of annularity, with about 98% of the Sun's disc obscured, and a ring of Sun seen around the Moon:

	Eclipse Begins	Annularity Begins	Annularity Ends	Eclipse Ends
Cue (WA)	14:10	15:34.5	15:35.3	16:49
Mullewa (WA)	14:03	15:29.6	15:30.1	16:46
Tennant Creek (NT)	16:18	17:30.2	17:31.3	18:35
Burketown (Qld)	16:56	18:04.6	18:05.7	19:06
Ayton (Qld)	17:03	18:07.6	18:08.7	(sunset 18:51)

On the Queensland coast, the Sun set while the eclipse was still in progress (although, in all cases, this was after annularity). The path of annularity here passes almost exactly between Cooktown, which was a few kilometres north of the path's edge, and Daintree, which was a few kilometres south. The town of Ayton was very close to the centre line.

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