**Press release and education advisory**

For people in the eastern United States, the sun will rise half covered by the moon on Sunday morning, November 3, and the partial eclipse will last about 3/4 of an hour. Jay Pasachoff, chair of the International Astronomical Union's Working Group on Eclipses, advises that people able to see very low on the eastern horizon and having suitable filters in hand would enjoy the event.

A total solar eclipse will sweep across Africa on that Sunday afternoon. After starting in the Atlantic, it will reach Gabon, where Pasachoff and colleagues will observe totality, with the support of a research grant from the Committee for Research and Exploration of the National Geographic Society.

The eclipse will then continue across Africa through the Congos until it passes through northern Uganda, northern Kenya, southern Ethiopia, and Somalia. The path of totality, when the bright everyday surface of the sun is entirely covered by the moon, will cross the middle of Gabon. Totality, weather permitting, in the middle of Gabon will be about 1 minute long, compared with only about 10 seconds long in northern Kenya.

Only partial phases of the eclipse will be visible in the US, in southern Europe (Spain, lower Italy, and Greece) and throughout the rest of Gabon, and through almost all of Africa (except for the southernmost tip).

Since the Sun's everyday surface is too bright to look at safely, to safely look at the partial phases people will have to make a simple "pinhole camera" (merely a 3 mm or so hole in a piece of paper that is used to project the sun onto another piece of paper, and then you look at that second paper with the sun behind you) or else get special filters--much, much darker than ordinary sunglasses-- made to be safe for observing the sun.

In the United States, the partial eclipse will be visible at sunrise, 6:30 am on that day in the eastern standard timezone. (Earlier that morning, daylight saving time will end.) The sun's diameter will be over 50% covered by the silhouette of the moon at sunrise in Boston and New York, and 47% covered in Washington, DC, and Miami. By about 45 minutes later, when the eclipse is about 8° high in the sky (about four fingers high at the end of your outstretched arm), only a tiny bit of the sun would be covered by the moon's silhouette. So viewers will really want to look between sunrise and about a half hour later, when the sun is only about 2 fingers high on the east-southeast horizon.

A Google map showing the eclipse path (available at the easy-to-remember website of http://www.eclipses.info) is at

http://xjubier.free.fr/en/site\_pages/solar\_eclipses/xSE\_GoogleMapFull\_Test.php?Ecl=+20131103&Acc=1&Umb=0&Lmt=1&Mag=1&Max=1

and you can zoom into it and click at any location to see your local circumstances.

During a partial eclipse, the remaining surface of the Sun is too bright to look at safely without a filter or a pinhole camera. Natural pinholes are made by the spaces between the leaves in a tree, so sometimes just looking at the ground under a tree will reveal crescent images on the ground.

The Sun is so bright that sunglasses are of no help in cutting its brightness down to a safe level. Even a DVD or CD, though its coating cuts the sunlight's brightness considerably, is not safe (and certainly not safe to look through the hole). Numbers 13 or 14 welder's glass is safe to look through. In any case, when using a filter, never look for more than a few seconds at a time. Only with a pinhole camera, when you look away from the Sun at its projection rather than at the Sun, can you stare at the image for as long as you like.

Prof. Jay Pasachoff of Williams College in Williamstown, Massachusetts, the Chair of the International Astronomical Union's Working Group on Eclipses, will be in Gabon with a team of students, colleagues, and tourists to see the eclipse. His scientific research at the eclipse is supported by a grant from the Committee for Research and Exploration of the National Geographic Society.

The fact that eclipses can be predicted so accurately, to within a second of time, is a triumph for science and can be an inspiration for students who observe the eclipse.

The scientific groups in Gabon, including that of Prof. Pasachoff in Gabon, where he will work with Dr. Vojtech Rusin of the Astronomical Institute of Slovakia, Williams College students, and others be attempting to study the solar corona. They will study their observations together with observations of the sun made from spacecraft from the NASA and the European Space Agency. One goal is to improve scientists' knowledge of "space weather," how particles and light coming from the Sun interacts with the Earth's atmosphere and with earth-orbiting communication and other spacecraft. In Gabon, Pasachoff's group is advising and being assisted by the Gabon Space Agency and Nommo Astronomia, the Gabon Astronomy Society.

Extensive maps of the eclipse are made by Michael Zeiler, http://www.eclipse-maps.com, and Fred Espenak, http://eclipse.gsfc.nasa.gov. Transformation of Espenak's data to a zoomable Google map has been made by Xavier Jubier of Paris, France.

prepared by Jay M. Pasachoff, 15 October 2013

http://www.eclipses.info, email: eclipse@williams.edu

maps: http://tinyurl.com/eclipse13map

(which is shortened fromhttp://xjubier.free.fr/en/site\_pages/solar\_eclipses/xSE\_GoogleMapFull\_Test.php?Ecl=+20131103&Acc=1&Umb=0&Lmt=1&Mag=1&Max=1) or

http://eclipse.gsfc.nasa.gov/OH/OH2013.html#SE2013Nov03H

pinhole camera: http://www.mreclipse.com/Totality2/TotalityCh11.html

"partial eclipse glasses" are available from

Thousand Oaks Optical, http://thousandoaksoptical.com

Rainbow Symphony, http://www.rainbowsymphony.net/eclipse-glasses.html

Astronomers Without Borders: http://astronomerswithoutborders.org

or store.astronomerswithoutborders.org/index.php?main\_page=index&cPath=7

Baader Planetarium, many suppliers found in Google searches

tables: http://media.skyandtelescope.com/documents/OH2013-Tab04.pdf