**Press release and education advisory**

A total solar eclipse will sweep across Africa in the afternoon of Sunday, November 3. After starting in the Atlantic, it will reach Gabon, and continue across Africa until it continues 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. Its lower edge will graze Cape Lopez north of Port Gentil, with a few seconds of diamomd-ring effect and perhaps a few seconds of totality, and more totality time will be visible a few kilometers north, in the ocean. The whole path will cross La Lopé National Park, though the north edge of the park with its town and train station will be outside the band of totality, and people there would have to travel south by about 20 km to be satisfactorily inside totality. Totality, weather permitting, in La Lopé will be about 1 minute long, compared with only about 10 seconds long in northern Kenya.

Throughout the rest of Gabon, and through almost all of Africa (except for the region of Cape Town), only partial phases of the eclipse will be visible. Since the Sun's everyday surface is too bright to look at safely, to see 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. The group Astronomers Without Borders is preparing donations of special filters in Gabon.

The partial phase of the eclipse will start at "first contact," when the Moon's advancing edge first apparently touches the Sun's edge, at 1:13 in Libreville (1:20 pm in La Lopé) local time. It then will take a few minutes before enough of the Sun is covered by the Moon to be visible when watching through special filters; the effect can't be seen at all without such filters or pinhole camera. Maximum coverage of the Sun by the Moon's silhouette will be at 2:51 in Libreville (2:56 pm in La Lopé). The last contact will be at 4:14 in Libreville (4:17 pm in La Lopé).

A Google map showing the eclipse path 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.

At Libreville, at its maximum, 98% of the everyday solar disk will be covered, so only a thin crescent will remain. But those 2% of the Sun are still about 5000 times brighter than the full moon and 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 will be halfway up in the sky (from the horizon to the top of the sky, the zenith) at the middle of the eclipse.

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 University in the United States, 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. He is collaborating with Dr. Patrice Okouma of the Gabon Astronomical Society and Aboubakar Mambimba Ndjoungui and Etienne Massard K. Makaga of AGEOS, the Gabon Space Agency, in providing public information on observing the eclipse. Dr. Mireille Obame-Nguema E. Moore, Conseiller chargé des Affaires Sociales et de Santé at the Gabon embassy to the U.S. in Washington, and Ambassador H. E. Michael Moussa-Adamo have been helpful in arrangements.

From the zone of totality, including the center of La Lopé, when the everyday Sun is hidden by the Moon, the sky gets as dark as twilight since sunlight is no longer present to turn the sky blue. As the Moon just covers the Sun, a reddish rim of of the Sun is visible, as the last valley on the edge of the Moon passes some sunlight, which tiny bit of sunlight looks so bright at the solar edge that it is known as the diamond-ring effect. Then, for about 60 seconds at La Lopé, a pearly white outer atmosphere of the Sun known as its corona, or crown, is visible. The corona has a shape that is set by the Sun's magnetic field. We are now near the maximum of the 11-year cycle of sunspots, and so there are streamers in the corona appearing outward in almost every direction, making the corona look fairly round. (Near the sunspot cycle's minimum, streamers appear only near the Sun's equator.) A few stars should be visible, as well as Mercury and Saturn in the sky near the Sun, if the sky is clear.

People in Port Gentil can go as far north on their peninsula as possible. If the Moon were perfectly round, they would see a few seconds of total eclipse, but the valleys at the edge of the Moon are predicted to be aligned so that enough everyday sunlight shines through that the faint outer atmosphere of the Sun would not be clearly visible. The farther north on the peninsula, the more interesting the effect. At Cape Lopez, people may see a a spectacular diamond-ring effect.

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. Even if it is cloudy, it is interesting to be outside to experience the eclipse darkening. The temperature should drop noticeably when over 60 per cent of the Sun is covered by the Moon, preventing that much sunlight from reaching Earth.

The scientific groups in Gabon, including that of Prof. Pasachoff in La Lopé, where he will work with Dr. Vojtech Rusin of the Astronomical Institute of Slovakia, and that of Dr. Zhangquan Qu from the Purple Mountain Observatory in China at Port Lopez, will be attempting to study the solar corona. They will study their observations together with observations of the sun made from spacecraft from the United States' 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.

Another solar eclipse will be visible from Gabon on 1 September 2016, and the same safety glasses for the partial phases will be usable. For the 2016 eclipse, the Moon will appear smaller than average and a ring of everyday sunlight will be visible even at the eclipses's maximum, so the sky will never go very dark.

prepared by Jay M. Pasachoff, 2 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