IYA Dark Skies Script Actions and Narration
Southern Hemisphere: Apparent Magnitude
Designed for use with Stellarium version 0.9.1

Synopsis: *This script provides defines the term "apparent magnitude" and discusses the brightest objects visible at about 9 pm on March 21, 2009.*

Note: *There are several pauses built into the Stellarium script; these are marked in the narration. To progress to the next part of the script, press the "k" key.*

Suggested Narration:

Let's observe the sky, which is set for March 21, 2009, at about 9 pm. As you look around, you'll see that some objects are bigger than others. These bigger dots are representing brighter objects.

Apparent magnitude is a measure of how bright an object appears from Earth. The lower the number, the brighter the object. The brightest celestial objects have negative values for apparent magnitude. For example, the Sun, our closest star, has an apparent magnitude of approximately −27. The full moon has an apparent magnitude of almost -13.

The human eye is capable of seeing objects down to about magnitude 6. A sixth magnitude object is about 100 times fainter than a first magnitude object.

Most of these really bright objects you're looking at are stars.

<PAUSE>

Let's label the stars that have apparent magnitudes of 1 or lower. Since the brightness of these stars make them very easy to find, all the labeled stars are in constellations. By observing the stars with just your eyes, can you tell which of the labeled stars is the brightest? We'll discuss them in order, from brightest to dimmest.

<PAUSE>

If you chose the star Sirius, in the north-northwest, you're correct. Sirius is in the constellation Canis Major, one of Orion's hunting dogs. Here in the southern hemisphere, we see this star in the summer and fall. Sirius is the brightest star we can see at night, with a magnitude of -1.42.

<PAUSE>

Can you tell which is the second brightest star in this sky? A hint: it's close to the zenith, which is the highest point of the sky. If you selected Canopus, you're absolutely right. Canopus is in the constellation Carina, the keel of the ship Argo Navis. It has an apparent magnitude of -0.60.

<PAUSE>

It's going to get a bit tougher to guess the order from here on out... What's the third brightest star in the current sky? Rigil Kent, low in the south-southeast in the constellation Centaurus. Rigil Kent has an apparent magnitude of just over 0, 0.01.

<PAUSE>

Fourth brightest is the star Rigel, low in the northwest in the famous constellation of Orion the hunter. Rigel is a bluish-white supergiant star, and its name is Arabic for foot. It is a variable star, with an average apparent magnitude of 0.20. The v in the label of course stands for variable.

<PAUSE>

Fifth brightest is the star Procyon, in the north. Procyon is in the constellation Canis Minor, the little dog, who is another hunting companion of Orion. Procyon has an apparent magnitude of 0.42.

<PAUSE>

We have a tie for sixth place, so we'll go in alphabetical order. Next is Achernar in the southwest part of the sky, in the constellation Eridanus, the river. One Greek legend says that the river Eridanus flows from the water jug of Aquarius. Achernar has a magnitude of 0.47.

<PAUSE>

Also with an apparent magnitude of 0.47, is the red giant star Betelgeuse in Orion, seventh in our list. In Arabic, Betelgeuse roughly translates as “armpit of the giant.”

<PAUSE>

Eighth brightest is the star Hadar, just a bit higher in the sky than Rigil Kent. Hadar is in the constellation Centaurus, and it has an apparent magnitude of 0.63.

<PAUSE>

The ninth brightest star is Aldebaran, low in the northwest. Aldebaran is the bull's eye—the eye of Taurus the bull, that is. It is a red giant star with an apparent magnitude of 0.89.

<PAUSE>

Tenth and last in our list is Spica, low in the east part of the sky in the constellation Virgo. Spica's apparent magnitude is also variable, with an average of 1.00.

<PAUSE>

You may have noticed that there is one large unlabeled dot in the east-northeast part of the sky. That's obviously not a star, since it would have been labeled with the others. What is it then?

<PAUSE>

It's a planet, Saturn, in fact. Unlike most stars, the apparent magnitudes of planets change, since Earth and the other planets are orbiting the sun and are constantly changing position relative to each other. At this point in time, March 21, 2009 at about 9 pm, Saturn's apparent magnitude is just under 0.93. We'll include a v for variable in our label, as we did with Rigel in Orion, to help us remember that Saturn's apparent magnitude changes.

To sum up, apparent magnitude is a measure of how bright an object appears from Earth. One of the primary uses of apparent magnitude is to determine the amount of light pollution in an area's sky: the fainter the stars you can see, the less light pollution there is in that area. This data can help astronomers argue for light pollution prevention or corrective measures.