

The December Sky

How far can you see without a telescope? The Moon? Saturn? Saturn is 10 times farther from the Sun than the Earth. Uranus is *just* visible to the naked eye, if you have young eyes, and is two times the distance to Saturn.

The finite speed of light (300,000 km per *second*) means that we see Saturn as it was 90 minutes ago. Saturn is 90 *light-minutes* away. Most of the stars you can see at night are, at most, a few thousand *light-years* distant.

By far the most distant object you can spot without optical aid is the Andromeda galaxy. In long exposure photographs it spans 3° , or the equivalent width of six full moons across.

The [Andromeda galaxy](#) was observed at least as early as the 10th century, by the astronomer al-Sufi. Simon Marius' description 'like a candle viewed through horn' is very apt. Even with binoculars or a telescope, you only see the very core of a spiral galaxy not unlike our Milky Way. A viewer in Andromeda looking back at the Milky Way would see about the same view of us.

The first modern estimates of the distance to M31 were too small by a factor of four. A distance of more than 2.5 million light-years is firmly established now. No large revisions in distance seem likely. When the light from *Andromeda* enters your eyes, know that when it started the trip, the species *homo sapiens* was still more than two million years in Earth's future. M31 is nicely placed near the zenith by 7PM this month. A finder chart for Andromeda can be found [here](#).

You will find an [all-sky finder chart](#) and the PDF of this flyer at [our web site](#).



The logo features the letters 'UK' in a large, blue, serif font. To the right of 'UK' is a stylized graphic of a telescope dome with a red and white striped top. Further right, the name 'MacAdam' is written in a blue, sans-serif font. Below 'MacAdam' is a horizontal red line. Underneath the red line, the words 'STUDENT OBSERVATORY' are written in a bold, black, sans-serif font.

UK MacAdam STUDENT OBSERVATORY

UK's MacAdam Student Observatory, designed and built in 2007, was officially opened in 2008. The Observatory is located atop Parking Structure #2 between the W.T. Young Library and the Chemistry-Physics Building, and its dome houses a high-quality 20-inch reflecting telescope plus a variety of state-of-the-art optical instruments. The Observatory is dedicated to serving UK students as well as astronomy enthusiasts of every age and experience level throughout Kentucky.

Are you interested in informal talks on astronomy and astrophysics? Are you curious about telescope design and operation? Would you care to take a look through the eyepiece?

The Department of Physics & Astronomy in UK's College of Arts & Sciences welcomes you! Join us to experience the excitement of stargazing through a powerful telescope. An up-to-date calendar of events can be found on our website:

<https://pa.as.uky.edu/observatory>



