

A Night at Cerro Tololo Inter-American Observatory



How to get to use the telescopes:

- 1) write and submit one (or more) research proposal(s)
- 2) wait a few months to see if proposal is successful
- 3) you may be awarded 1 to 30 nights in a year
- 4) with collaborations, one can make multiple trips to the mountain; *or* maybe the observations will be taken by an observing specialist. However, no one will ever follow your instructions to a tee. (“If you want it done right, do it yourself.”)



Some views at
Cerro Tololo
Observatory,
Chile





Fox, condor, and vizcacha
at Cerro Tololo



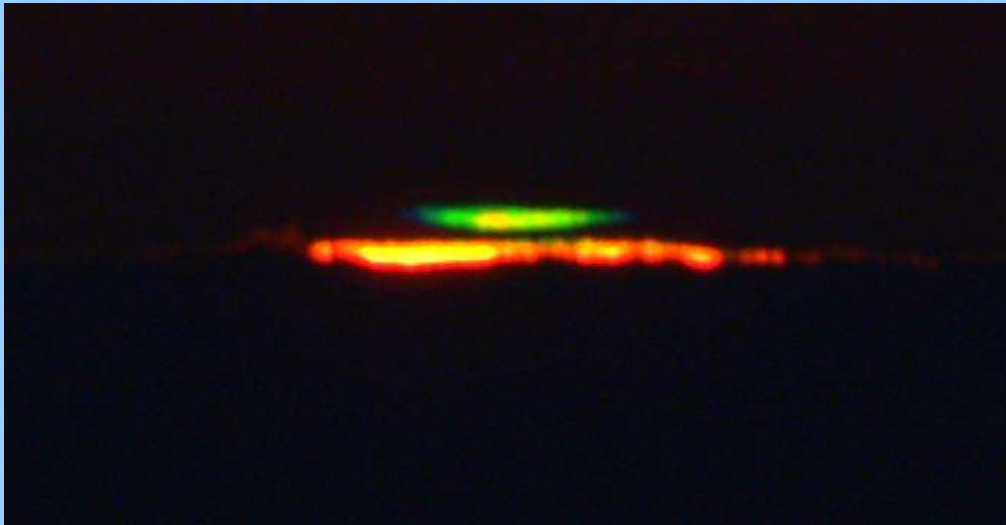
Until 1999 there was a fleet of VW bugs at CTIO for the astronomers' use.

Afternoon activities:

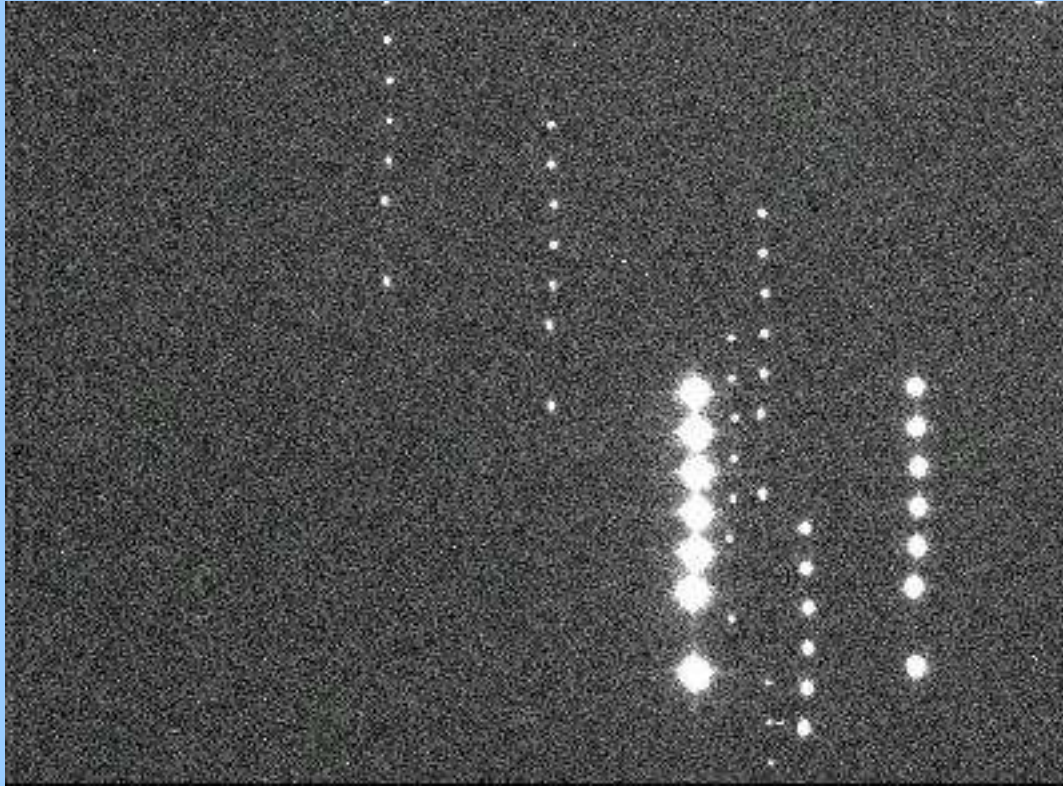
Tests of telescope and its camera/spectrograph

Submit night lunch request by 3 PM

Take a nap – if you're lucky you'll be working until morning twilight



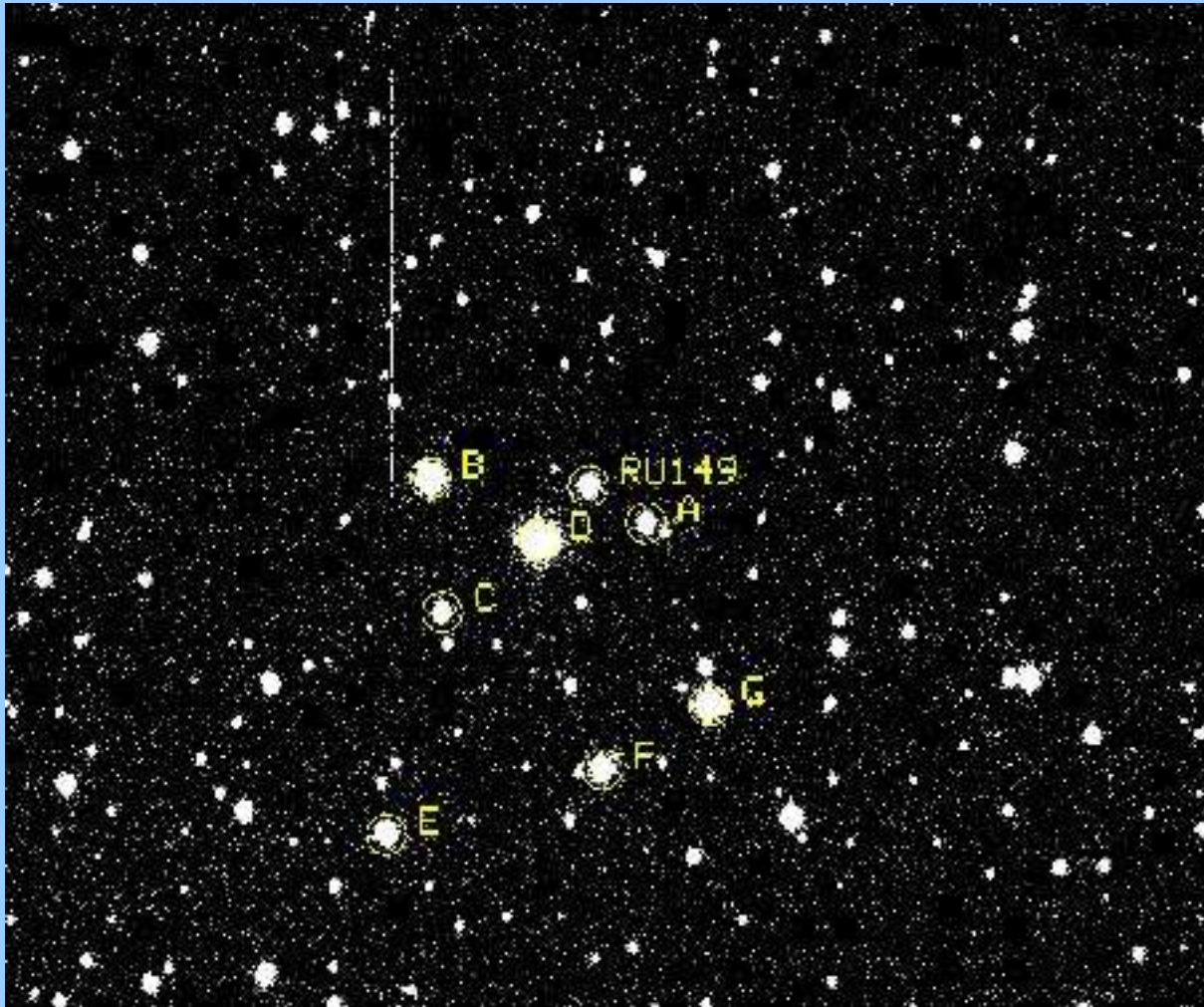
Sometimes
at CTIO you
can see the
green flash
at sunset,
like in this
picture by
Tim Abbott.



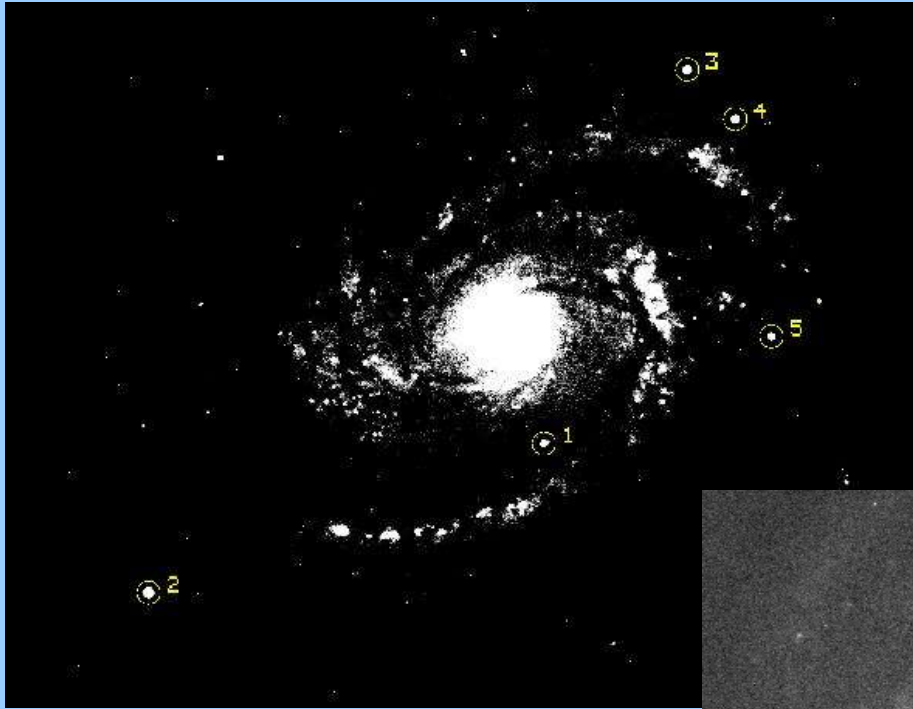
Before you start observing for the night,
you must check the focus of the telescope.

A digital camera uses various colored filters such as blue, green, orange, and red in order to images various fields at multiple wavelengths. Because we are always observing through the Earth's atmosphere (which can change transparency), in order to calibrate the magnitudes of our research fields, we must also observe stars of known brightness and color.

Even on what seems to be a very clear night, a smart observer starts with a field of standard stars, observes one every hour and a half to two hours, and finishes the night with a field of standards.

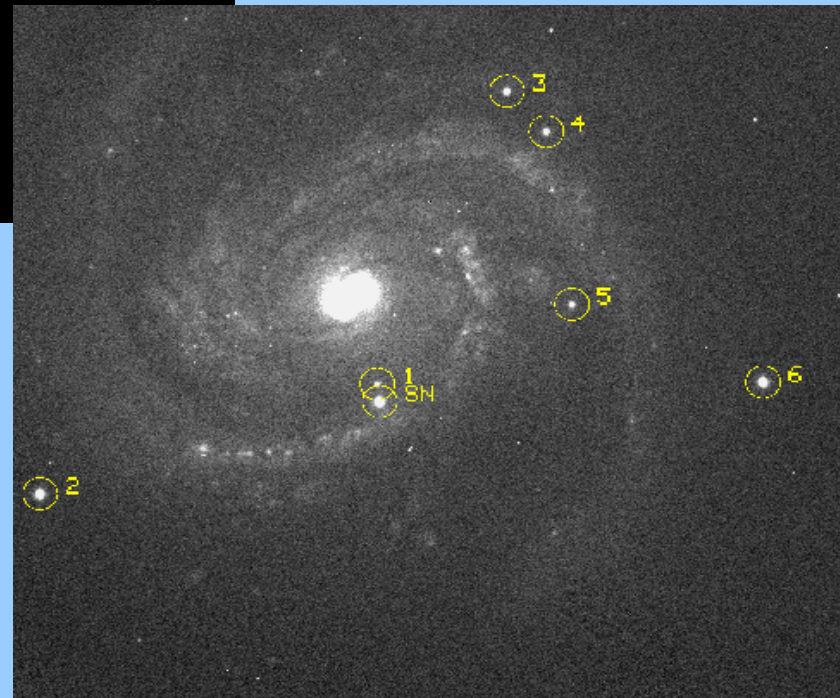


A field of standard stars

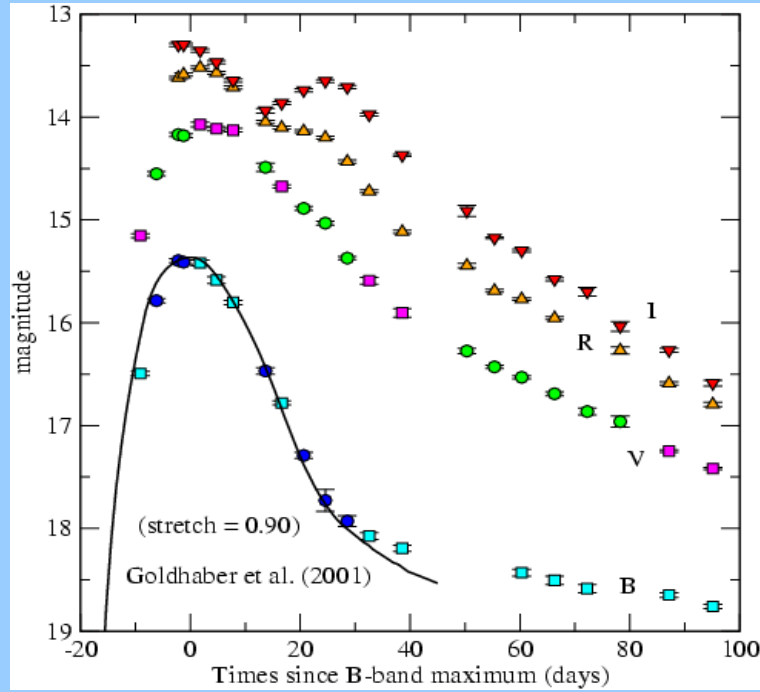


Left: Galaxy M 100
on 24 April 2000

Right: M 100 on
21 February 2006
(note new star)

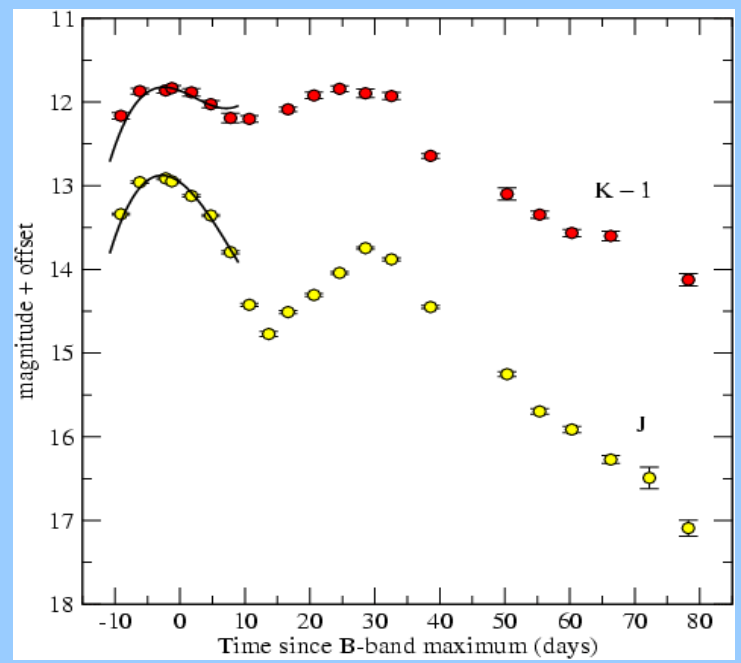


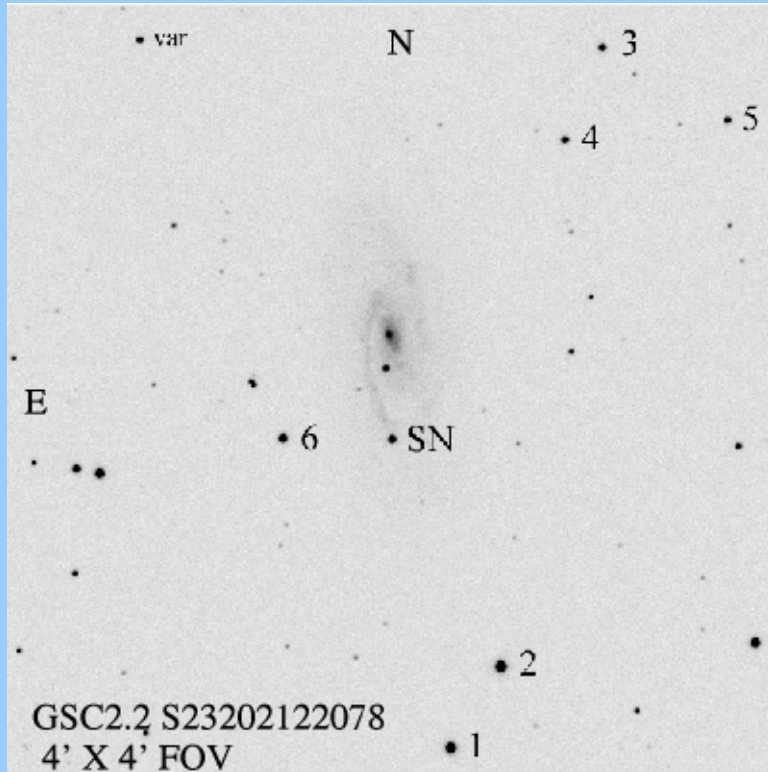
After observations with the CTIO 1.3-m telescope for more than 3 months, we were able to produce the light curves shown on the next slide. A “light curve” is a graph of the brightness of an object vs. time. Depending on changes in the spectrum of the object, the light curves made with different colored filters often look different.



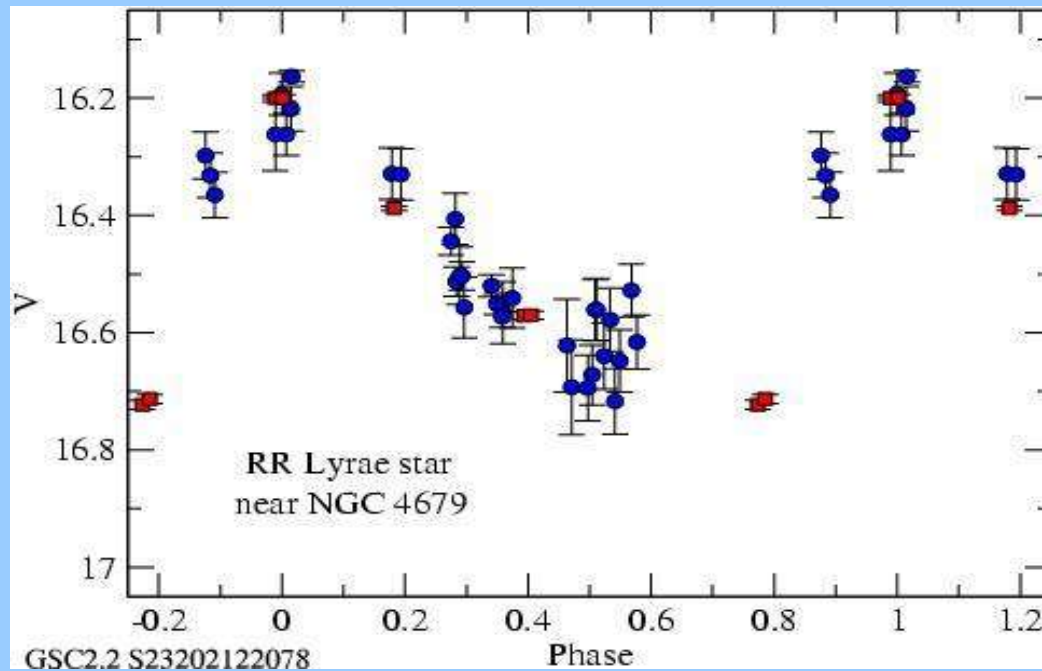
Left: optical variations of the light of SN 2006X

Right: variations of the light of SN 2006X in the near-infrared





Here is a finder chart for SN 2001cz in the galaxy NGC 4679. If shown like a black and white negative, it is easier to see the fainter stars. The star labelled “var” was also variable in brightness.



The variable star near NGC 4679 is an RR Lyrae pulsating star in our Galaxy. Its period is 0.6405 days = 15.37 hours.

