



# GLOBE AT NIGHT

## Family Activity Packet: Observation Guide

[www.globeatnight.org](http://www.globeatnight.org)

2012 Campaign Dates that use Crux: Jan. 14-23, Feb. 12-21, March 13-22 & April 11-20

Children and their families are encouraged to participate in a global campaign to observe and record the brightness of the faintest stars visible as a means of measuring light pollution in a given location. By locating and observing the constellation Crux in the night sky and comparing it to “magnitude” charts, children from around the world will learn how the lights in their community contribute to light pollution. Their contributions to the online database will document the visible nighttime sky.

### Materials Needed:

- GLOBE at Night Teacher or Family Activity Packet
- Something to write on (clipboard or cardboard)
- Something to write with (pencil or pen)
- Red light to preserve night vision (A red light can be made by covering a flashlight with a brown paper bag or a red balloon with the neck cut off.)
- Optional: smart mobile device, GPS unit, or a topographic map to determine your latitude and longitude

### Remember Safety First!

- Please use your judgment as to whether your child should be supervised outside after dark at your location. **We encourage you to do this activity with your child.**
- Be sure your child is wearing suitable clothing for the weather and for being outside at night (light colored and/or with reflective colors).
- When choosing the darkest area in your location, make sure your student is not close to traffic, the edge of a balcony, or near danger in any other way.

### Multiple Observations:

You can enter more than one observation by moving to a new location at least 1 km away from your original location. Don't forget to get new latitude and longitude coordinates. This can be done on the same night or on another night any time during the dates of the campaign.

**Note:** Crux is a constellation in the southern hemisphere. It can be seen during the mid-March and mid-April campaigns, but during the January and February campaign times, it is not visible at locations with latitudes north of 20 degrees S and north of 10 degrees S, respectively, between 8-10:00pm local.

**Note for higher latitudes (>45 N or S):** You need to do your observation closer to 9:00 pm rather than 8:00pm.

### Five Easy Star-Hunting Steps:

([www.globeatnight.org/observe.html](http://www.globeatnight.org/observe.html))

- 1) Find your latitude and longitude** using any of the following:
  - a. Use the interactive tool in the web application at [www.globeatnight.org/webapp/](http://www.globeatnight.org/webapp/). With a smart cell phone or tablet, the latitude and longitude are automatically determined as you report the observation. If you are reporting it later on your computer, input the address of the observation. Or input your city; zoom in/out and pan around until you find it. The latitude and longitude will be displayed.
  - b. Visit [eo.ucar.edu/geocode](http://eo.ucar.edu/geocode) online for a similar tool.
  - c. Use a GPS unit where you take a measurement. Report as many decimal places as the unit provides.
  - d. Use a topographic map of your area.
- 2) Find Crux by going outside at least an hour after sunset** approximately between 8-10 pm local time. (Note for higher latitudes (>45 degrees North or South), you will need to do your observation closer to 9:00 pm rather than 8:00 pm.)
  - a. Determine the darkest area by moving to where the most stars are visible in the sky toward Crux. If you have outside lights, be sure they are all off.
  - b. Wait outside for at least 10 minutes for your eyes to adapt to the darkness. This is called becoming “dark-adapted.”
  - c. Locate Crux in the sky. For help use the appropriate Crux Finder Chart for your latitude. See ([www.globeatnight.org/observe\\_finder.html](http://www.globeatnight.org/observe_finder.html))
- 3) Match your nighttime sky to one of our magnitude charts** (pp. 2-3 or [www.globeatnight.org/observe\\_magnitude.html](http://www.globeatnight.org/observe_magnitude.html)).
  - a. Select the chart that most closely resembles what you are seeing.
  - b. Estimate the cloud cover in the sky.
  - c. Fill out the Observation Sheet (page 4).
- 4) Report your observation online** (if not done already by smart mobile device) at: [www.globeatnight.org/report.html](http://www.globeatnight.org/report.html).
  - a. There are 3 sets of campaign dates in 2012 that use Crux: Jan. 14-23, Feb. 12-21, March 13-22 and April 11-20. During those dates, take observations from different locations!
  - b. Your observations can be reported online any time up to the last day of the campaign month (e.g., January 31, February 29, March 31, and April 30, respectively).
- 5) Compare your observation** to thousands around the world at: [www.globeatnight.org/analyze.html](http://www.globeatnight.org/analyze.html)

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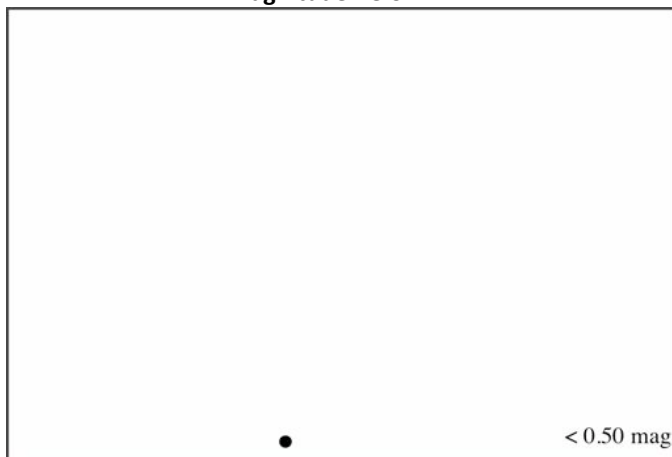
[www.globeatnight.org](http://www.globeatnight.org)

2012 Campaign Dates that use Crux: Jan. 14-23, Feb. 12-21, March 13-22 & April 11-20

Please orient this page with the arrows up according to your location (e.g., near the equator or in the Southern Hemisphere).

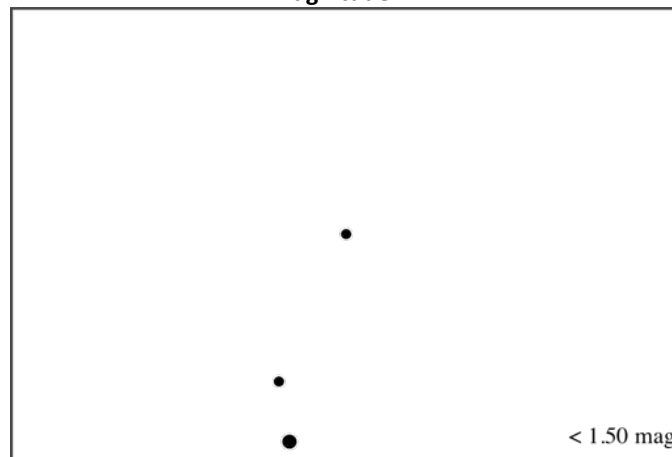
↑ Southern Hemisphere View ↑

Magnitude Below 1



Hint: You can't see Crux because the sky is too bright. The single bright star is called alpha Centauri or Toliman.

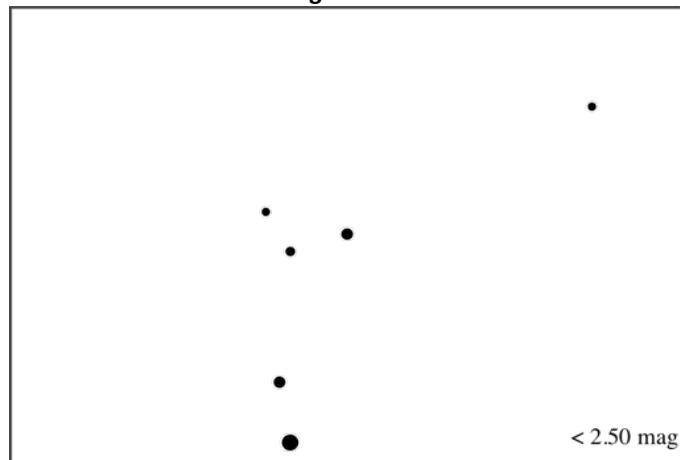
Magnitude 1



Three stars can be seen toward the constellation Crux: alpha Crux or Acrux, alpha Centauri and the star between them, beta Centauri or Hadar.

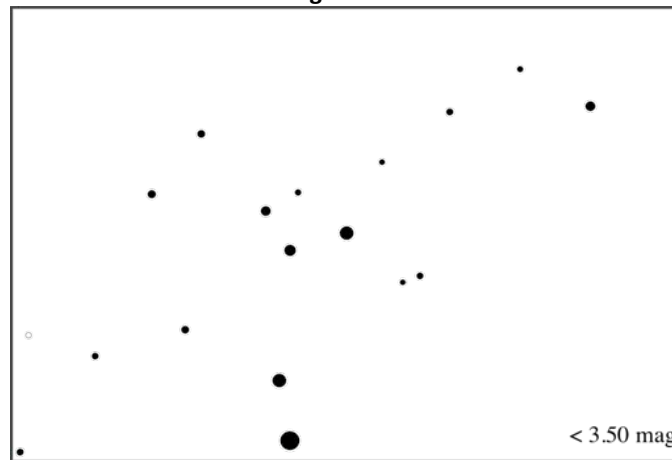
↑ Near Equator View ↑

Magnitude 2



Hint: Two more stars in Crux can be seen in addition to Acrux, alpha Centauri and beta Centauri.

Magnitude 3



Hint: The fourth main star in Crux can be seen. Together with the other three main stars in Crux, they are the ends of a cross. The next 3 brightest stars in Centaurus surround Crux.

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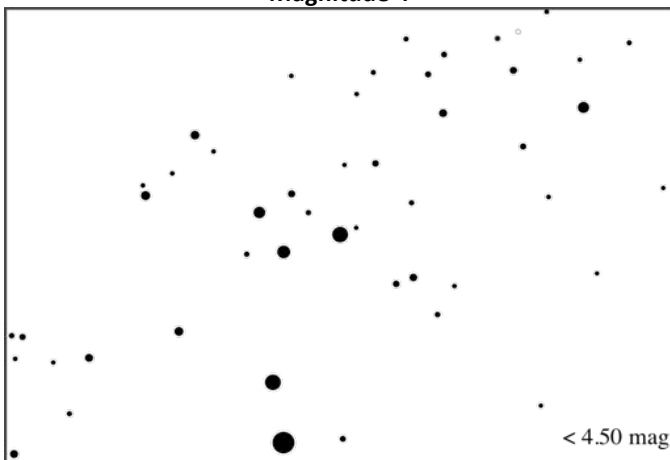
[www.globeatnight.org](http://www.globeatnight.org)

2012 Campaign Dates that use Crux: Jan. 14-23, Feb. 12-21, March 13-22 & April 11-20

Please orient this page with the arrows up according to your location (e.g., in the Northern Hemisphere, near the equator or in the Southern Hemisphere).

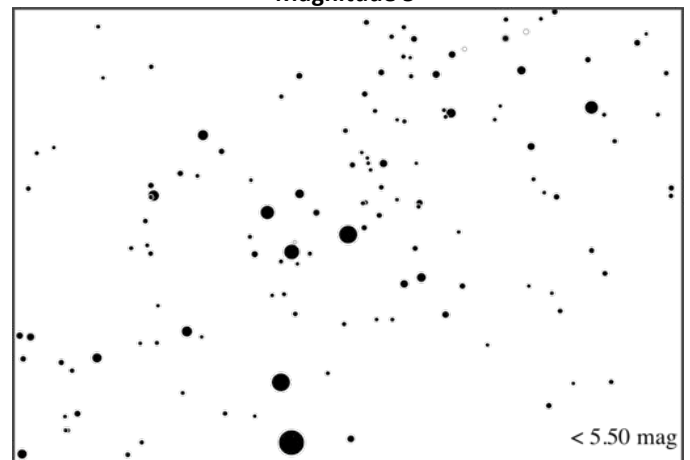
↑ Southern Hemisphere View ↑

Magnitude 4



Hint: The fifth brightest star in Crux can now be seen (epsilon Crucis) just inside the "kite". A couple of stars surround Crux and gamma and delta Centauri.

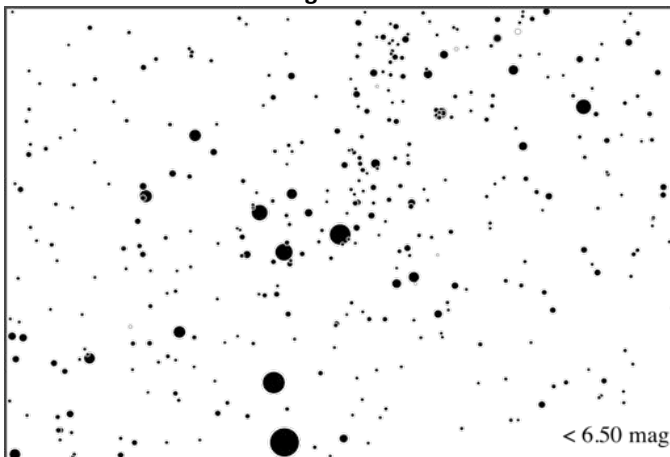
Magnitude 5



Hint: A few more stars surround Crux and gamma and delta Centauri.

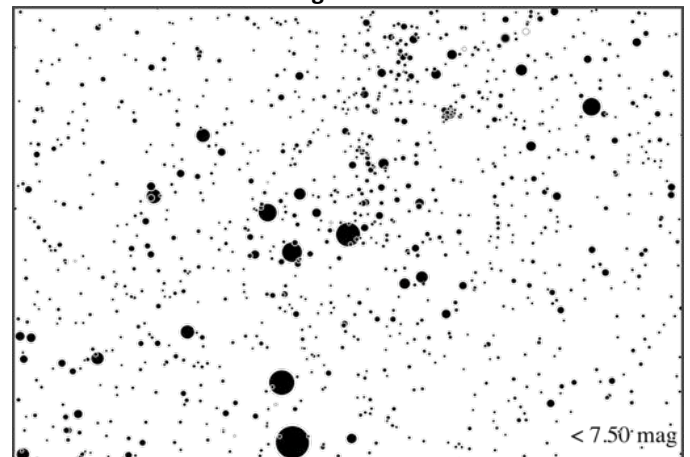
↑ Near Equator View ↑

Magnitude 6



Hint: Stars can now be seen within the "kite" or cross of Crux.

Magnitude 7



Hint: You can't count that many stars!

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Only fields marked by \* are required.

\*Date: March / April (circle month) \_\_\_\_\_, 2011  
\*Observation Time: \_\_\_\_:\_\_\_\_ PM local time (HH:MM)    \*Country: \_\_\_\_\_  
\*Latitude (in deg/min/sec    \_\_\_\_ deg \_\_\_\_ min \_\_\_\_ sec    (North / South) circle direction  
or decimal degrees):    \_\_\_\_\_ decimal degrees  
\*Longitude (in deg/min/sec    \_\_\_\_ deg \_\_\_\_ min \_\_\_\_ sec    (East / West) circle direction  
or decimal degrees):    \_\_\_\_\_ decimal degrees  
Comments on location: (e.g. There is one street light within 50 m that is shielded from my view.)

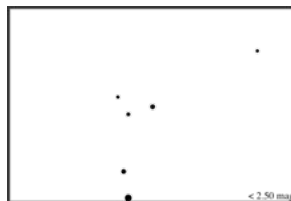
\*Match your nighttime sky to one of our magnitude charts :



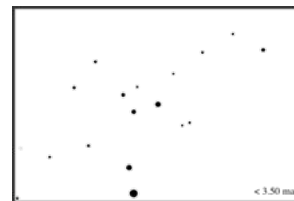
Stars in Crux not visible



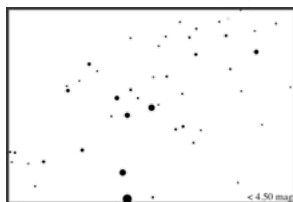
Magnitude 1 Chart



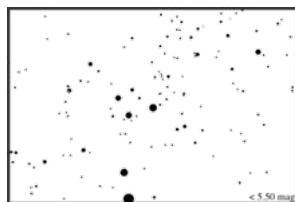
Magnitude 2 Chart



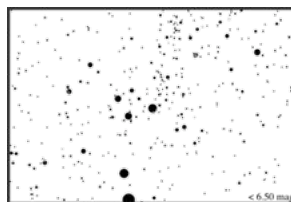
Magnitude 3 Chart



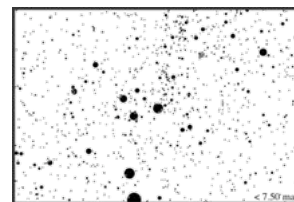
Magnitude 4 Chart



Magnitude 5 Chart



Magnitude 6 Chart



Magnitude 7 Chart

Reading from the Unihedron Sky Quality Meter (if applicable): \_\_\_\_\_

Serial number from the Unihedron Sky Quality Meter (if applicable): \_\_\_\_\_

\*Estimate the cloud cover in the sky:

Clear     Clouds cover ¼ of sky     Clouds cover ½ of sky     Clouds cover > ½ of sky

Comments on sky conditions: (e.g. a little haze to the north)

Report online at [www.globeatnight.org/report.html](http://www.globeatnight.org/report.html)