Put on your cosmic visors.

You are an alien from another world. You have alien eyes.
What do you notice about your vision?

Your job is to visit planet RGB and report back to your commander.

You have arrived.

Your commander will ask you to report what you see. Wait for instructions.

Click the mouse to look out of the window of your space ship.


Describe what you see...

The commander is getting different reports
from different aliens!

Please change your cosmic visor and go back
to check your observations.
Try all three visors before moving on.

When you are ready, the commander would like you
to decode a message from Planet RGB...

Once again the commander is getting mixed messages!

Change your visor again and
go back to re-read the code.

Try each color visor before moving on.

Did you notice that the message changed?

Red aliens see the numbers '4,3,2,1'
Blue aliens received a nice 'hi'
Green aliens are picking up 'help'

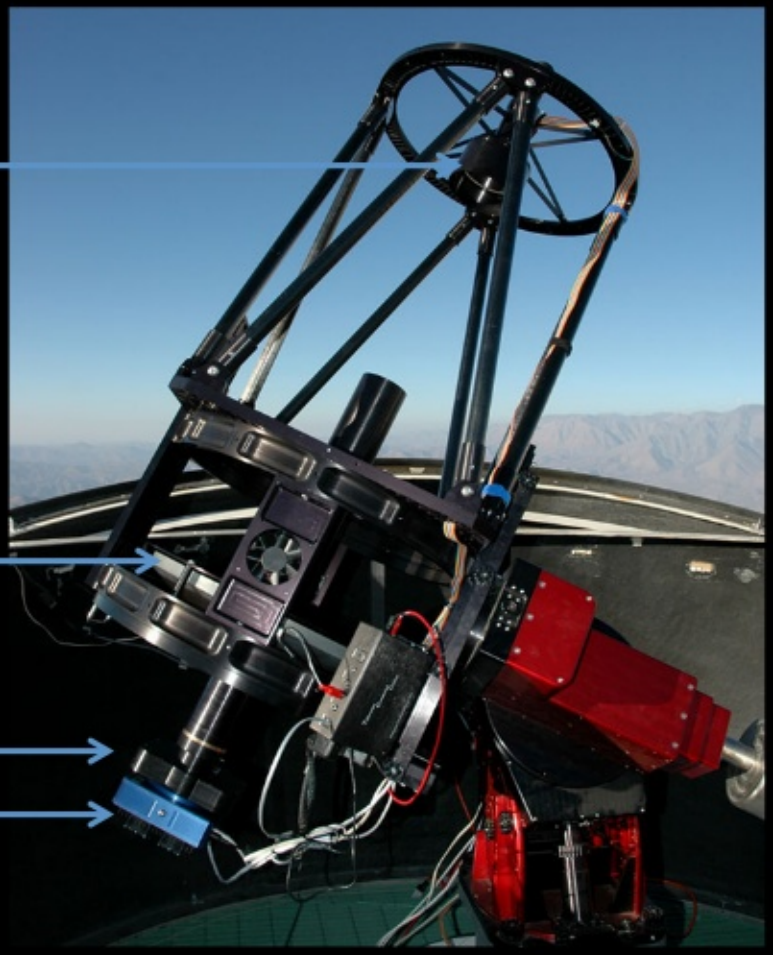
Your cosmic visors are filters. They let only one color or wavelength of light through. Are they useful in detecting different messages?

Look at the next picture with each filter and try to explain why the cloud can be seen through all of them.

Astronomers use filters too!

From the Faulkes Telescope Project:

Filter wheel and CCD animation

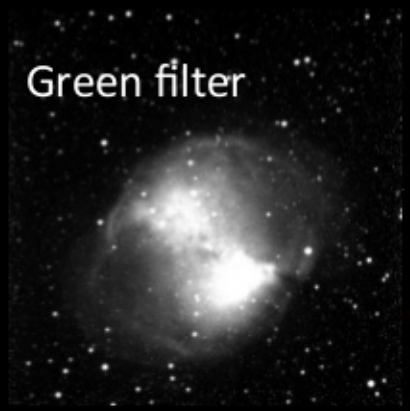


Astronomers don't need to turn their images into color pictures to do their science. But, by assigning colors to each image they can combine their data into one interesting and beautiful image!

The Dumbell Nebula is produced by a dying star. Its outer layers are being ejected in a beautiful expanding shell of gas. This gas is excited by the hot dying star in the center, and that makes it shine. The red light comes from excited hydrogen, and the blue and green light from excited oxygen.

The next slide shows how an astronomer used filters to collect different color light from the Dumbell Nebula and then combine the images to make a color picture.

M 27, Dumbbell Nebula



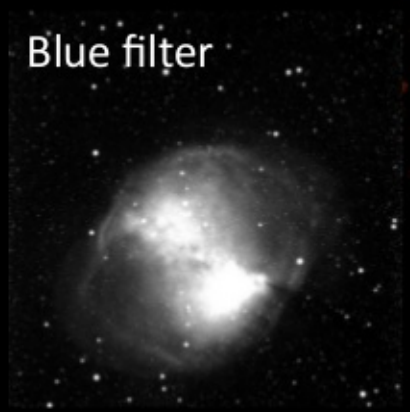


Image Credit: Ken Budill. This image combines 3 pictures: one through a red filter, one through a green filter, and one through a blue filter.
Color Key: red=red, green=green, blue=blue
Telescope: Yerkes 41-inch

Representational Images

Astronomers don't just combine images taken through red, green and blue filters. They use narrow-band filters too. They even combine images from very different telescopes like x-ray telescopes and radio telescopes!

For each upcoming image, read what each color represents, and then use your filters to check out the image.

M 17, Omega Nebula

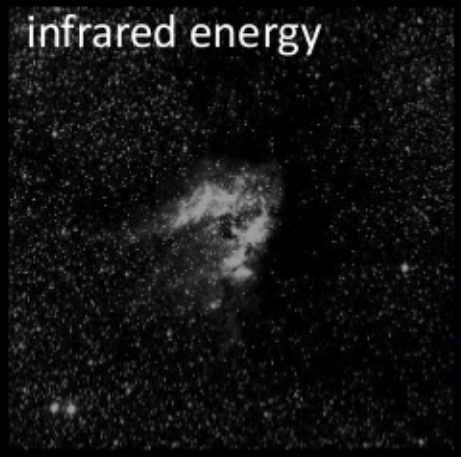


Image Credit: NRAO/AUI
Color Key: radio waves = red, infrared = green and visible light = blue
Telescopes: Palomar 48 inch, 2MASS, Green Bank Telescope.

M 17, Omega Nebula

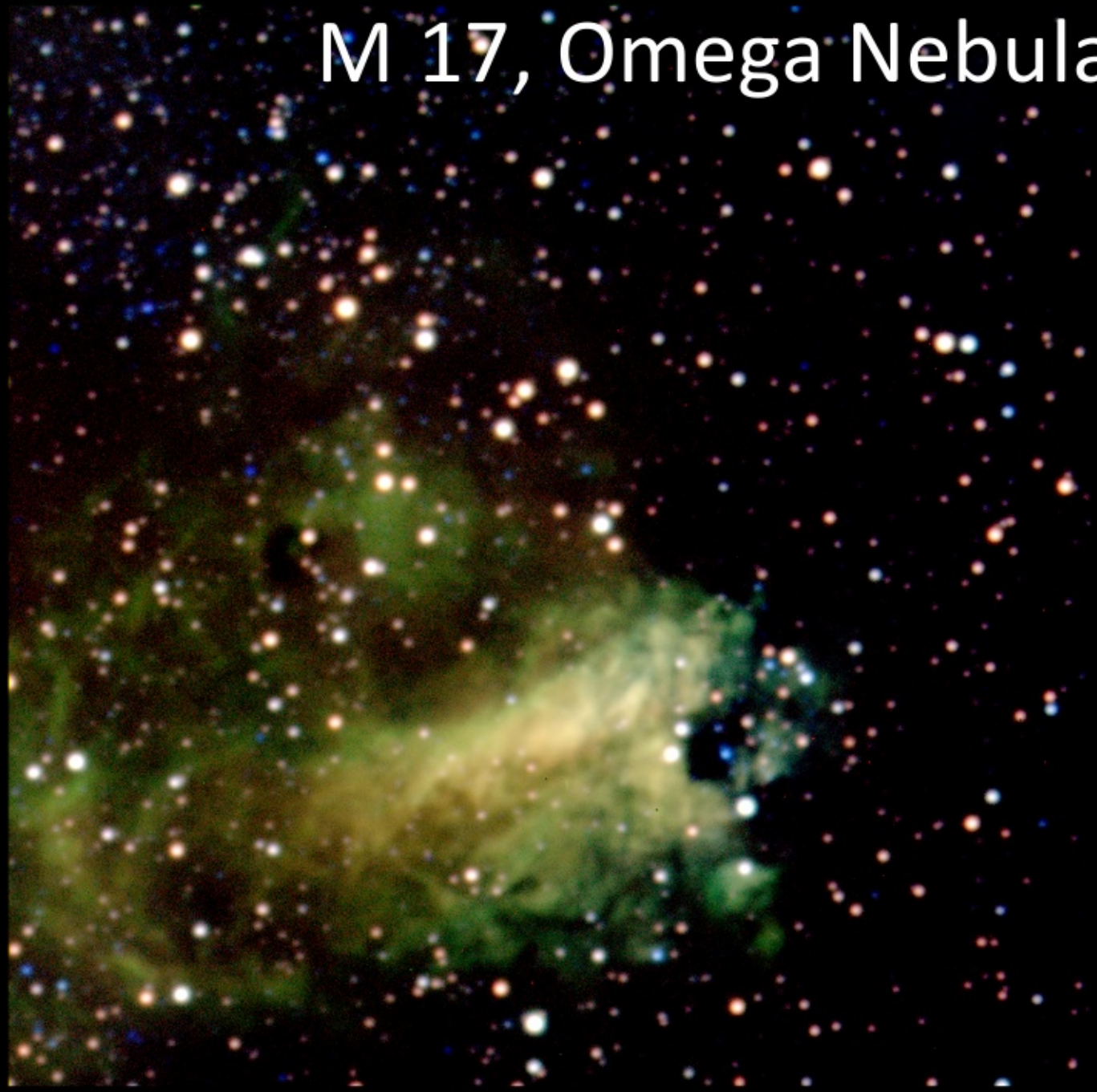


Image Credit:
Josh Thum

The filters used here were infrared, red and green.

Color Key:

- infrared = red
- red = green
- green = blue

Telescope:
Yerkes 41-inch

NGC 2818, Planetary Nebula

Image Credit: Hubble Space Telescope. Narrow band filters for nitrogen, hydrogen and oxygen were used and then combined into this representational color image.
Color Key: nitrogen = red, hydrogen = green and oxygen = blue.
Telescopes: Hubble Space Telescope

M 44, Crab Nebula

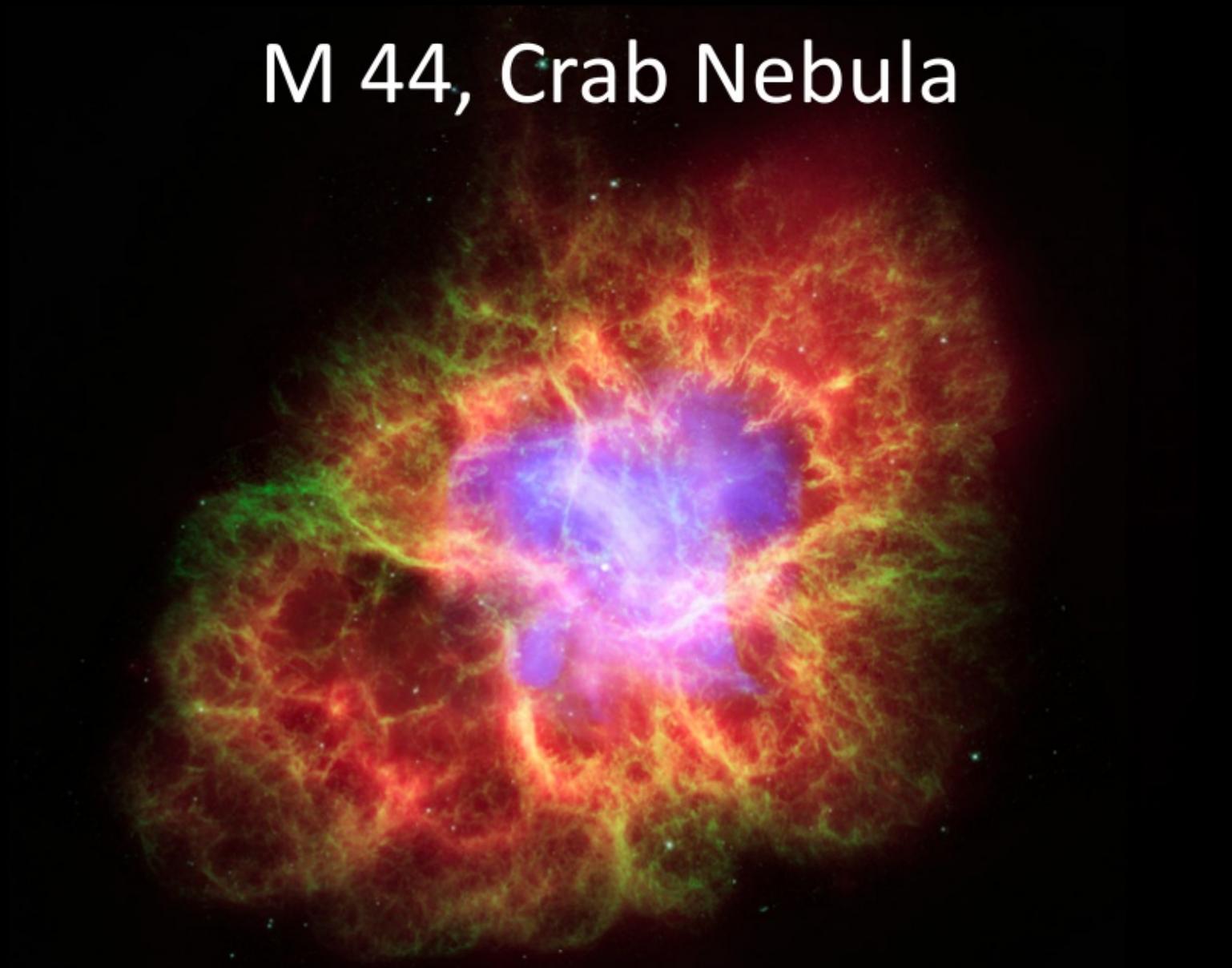


Image Credit: NASA, ESA and J. Hester .
Color Key: x-rays =light blue, visible light = green, dark blue, infrared energy = red.
Telescopes: Chandra X-Ray Observatory, Hubble Space Telescope, Spitzer Space Telescope.

M 83, Southern Pinwheel Galaxy

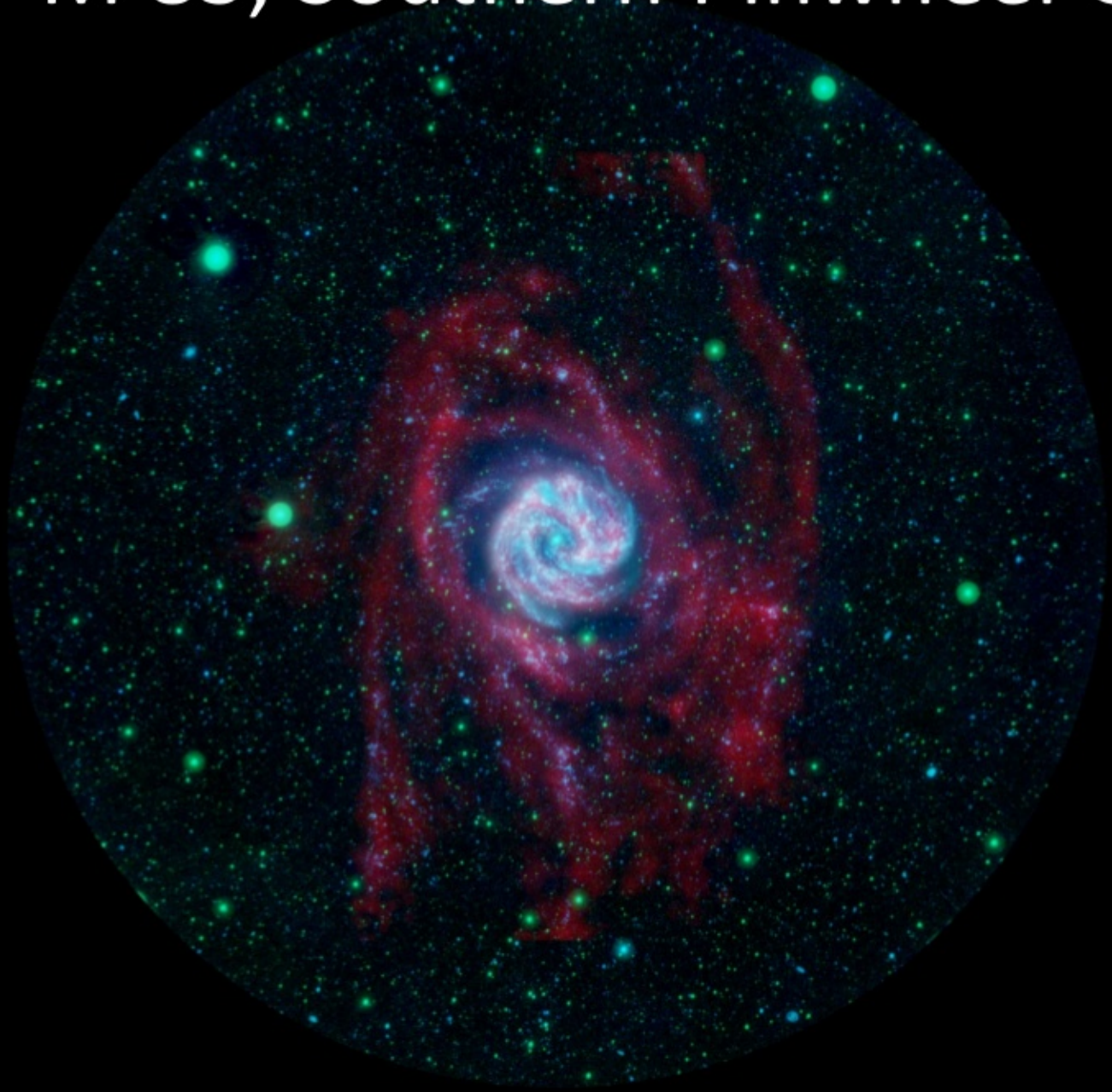


Image Credit:
NASA/NRAO/MPIA

Color Key:

- radio waves = red.
- near-ultraviolet light = green.
- far-ultraviolet light = blue.

Telescopes:
GALEX (Galaxy Evolution Explorer), Very Large Array