

ASTRONOMY WITH PROFESSOR TOM BANIA

TALKING POINTS

1. What is special about OB stars?
2. What are nebulae, and what is special about HII regions?
3. How do telescopes use the electromagnetic spectrum?
4. How does the Green Bank Telescope detect HII regions?
5. What does Tom highlight as being one of the hardest parts of astronomy?
6. What unusual findings has Tom's team found in their study of HII regions?

ACTIVITIES YOU CAN DO AT HOME OR IN THE CLASSROOM

1. An understanding of the electromagnetic spectrum is crucial for astronomers' research. Astronomers measure different types of electromagnetic radiation for different purposes. Use the internet to fill in the table below:

Type of radiation	How is it useful to astronomers?
Radio	
Microwave	
Infrared	
Visible light	
Ultraviolet	
X-rays	
Gamma rays	

2. Telescopes are crucial to astronomy. They are designed to pick up certain frequencies within the electromagnetic spectrum, but the specific frequencies targeted often differ. Some, like the ones you might have at home or at school, use visible light. Others, like the Green Bank Telescope, use lower frequencies.

Fill in the table of astronomical telescopes below, using the internet as your research tool. Think about how their design suits their purpose.

Telescope	Electromagnetic radiation picked up (e.g. radio, etc.)	Function
Green Bank Telescope		
Hubble Space Telescope		
Spitzer Space Telescope		
Chandra X-Ray Observatory		
Keck Observatory		

TOM'S RECOMMENDATIONS:

1. Visit www.skysurvey.org/survey. Tom says, "This is a great tool. Click on the 'INTERACTIVE 360' and 'ZOOM IN' images and play around!"
2. Tom describes www.heavens-above.com as, "really, really cool". Set up a free account and enter your latitude and longitude on Earth. If you live in a big city, there is a drop-down menu that does it for you. This site tells you where and when to look in the sky for time dependent things, besides the stars. An interesting object to look for is the International Space Station (ISS); the site will tell you when it is passing over where you live!

FURTHER RESOURCES:

1. Celestia is a free 3D simulation of space, that lets you explore stars, galaxies, planets, moons, asteroids, comets and spacecraft. You can get it at: www.celestia.space
2. The Institute of Physics has a number of astronomy videos and classroom demonstrations. You can access them at: www.iop.org/resources/videos/education/classroom/astronomy/page_51897.html#gref
3. NASA has a free app with a wealth of information on anything and everything space-related. You can access it via the App Store or at: <https://www.common sense.org/education/app/nasa>