

Name _____ Date: _____ Period: _____ EN: _____

Origins Movie Episode 4: Back to the Beginning

This video is about the origin and evolution of the universe. Despite not being able to travel back in time or away from our own planet, scientists nonetheless have a great wealth of evidence from which to develop theories about cosmic origins and evolution. That evidence comes to us in the form of electromagnetic radiation emitted from distant cosmic objects like stars and nebulae. In fact, scientists actually believe that they can observe the electromagnetic echo of the big bang itself. In this video, you will learn about how scientists are using different forms of electromagnetic radiation collected by special telescopes and satellites, to learn about the world beyond the solar system and back in time!

1. What was the **Telstar satellite** used for, what company built it, and in what decade did it operate?
2. What was the annoying problem with communications using the Telstar satellite?
3. What part of the electromagnetic spectrum did Telstar use to communicate?
4. In the video, the narrator says that violet is the shortest of all wavelengths. Is he right? What kinds of electromagnetic radiation are shorter than violet?
5. What is radioastronomy?
6. Two scientists working for AT&T, Penzious and Wilson, used a big microwave sensing “horn” to try to figure out what was causing the problem with the satellite communications. To test the horn, they pointed it at an empty part of the sky. What did they expect to find and what did they actually find in that part of the sky?

7. Scientists thought that what they found was evidence for something pretty big. What was it?

8. What household appliance can you use to detect the same electromagnetic signals that these scientists studied?

9. Why did scientists think that this radiation should be “textured” with bright areas and dim areas in the sky?

10. W-Map is a recent satellite that was designed to take high-resolution images of the background microwave radiation in the universe. What stage of the universe’s evolution did W-Map take pictures of?

11. What part of the electromagnetic spectrum do scientists use to investigate whether other galaxies have enough heavy elements to, theoretically, be suitable for life?

12. And what are the results; are there many other galaxies that have a suitable mix of elements for life?