

Reading Guide for November 24

from Gribbin and Gribbin, *From Here to Infinity*

Chapter 7. The Milky Way and Other Galaxies

pp. 160–161. This introduces our own **Milky Way**, which I hope you have seen before. The term “Milky Way” now identifies our entire home galaxy and thus every star our eyes see. In common usage, and originally, it refers specifically to a faint broad band that circles the entire sky.

pp. 161–164. *The Milky Way*. This describes the features, structure, and components of the Milky Way. Be able to define the terms **disc**, **bulge**, and **spiral arms**.

- What is a **globular cluster**?
- Where in the Milky Way are globular clusters located?
- What type of stars are found in globular clusters?
- What is a **Population II** star?
- What is a **Population I** star?
- Which type of star (population I or II) can have planets?
- What object appears to lie at the center of the Milky Way?
- How can astronomers estimate the amount of matter in the Milky Way?
- Why do astronomers think the Milky Way contains large amounts of **dark matter**?

pp. 164–171. *Stellar Nurseries*. Not all stars in the Milky Way are the same age. We have already learned how stars are born, grow old and die; here we learn where it happens.

- How dense is the gas in a **giant molecular cloud**?
- What is the origin of the material in a giant molecular cloud?
- What makes a galaxy’s **spiral arms** so visible?
- What actually is a spiral arm?

- What causes gas clouds in a spiral arm to collapse and form stars?

pp. 171–175. *An Average Galaxy*. This section is short, but it tells how astronomers learned something very important. Follow the chain of reasoning. What observations had to be made, and what inferences followed, to reach the conclusion that the Milky Way is an average-sized spiral galaxy?

pp. 175–197. *Islands in Space*. Galaxies are all individual, but they can be classified on the basis of their general characteristics.

- What are the two main types of galaxy?
- How are very large elliptical galaxies thought to have formed?

pp. 179–181. *Across the Universe*. This section describes the structure of the Universe as a whole. First, it tries to convey the scale of stars, the separation between stars in galaxies, and the separation between galaxies. Then it describes how the galaxies themselves are arranged.

- How can galaxies be proportionately close together although stars are so far apart from each other?
- What is the name of our **galaxy cluster**?
- What is the name of the nearest large galaxy cluster?
- What is the overall structure of the Universe?

pp. 182–185. *Galaxies with Attitude*. This describes the active galaxies.

- What is thought to be the common factor in all galactic activity?
- What causes energy outbursts in galactic nuclei?
- What causes the activity of a galaxy's nucleus to stop?
- How do we know that galaxies were more active in the past than they are now?