

1. The average galaxy may contain _____ stars.
2. But for a long time, we didn't know much about _____. Just a century ago, we thought that the Milky Way was all there was.
3. What did Edwin Hubble discover?
4. Andromeda, our nearest galactic neighbor, is over _____ across twice the size of the Milky Way.
5. The first _____ formed just 200 million years after the Big Bang. Then gravity pulled them together, building the first _____.
6. Hubble Deep Field sees galaxies shortly after they formed. Describe them.
7. Our current understanding is that stars form _____ that build into galaxies that build into clusters of galaxies that build into _____ of galaxies, the largest structures we observe in the universe today.
8. Early galaxies were a mess lumpy bunches of stars, _____, and dust.
9. So, how do messy galaxies transform into beautiful spirals and pinwheels? The answer is _____.
10. When scientists see a quasar blasting from a galaxy, they know it has a _____ black hole.
11. What is the evidence that the Milky Way has a supermassive black hole at the center?
12. Supermassive black holes don't have enough gravity to hold galaxies together – they should fly apart. So what holds them together?
13. We think that dark matter was created out of the _____, and dark matter began to clump, and these clumpings of dark matter eventually became the nuclei, the seeds, for our galaxy.

14. So, the dark matter, weight-for-weight, makes up at least _____ times as much of the universe as does normal matter, the stuff that we're all made from. And without it, the universe just wouldn't work the way that it seems to work.

15. If you take a look at the big picture, you realize that our galaxy is part of a local group of galaxies, perhaps 30, and our galaxy and _____ are the two biggest galaxies in this local group.

16. Pull back even more, and we see that these superclusters are connected into structures called _____.

17. At 4 billion light-years across, the Great Sloan Wall is the _____ ever discovered in the history of science.

18. Dark matter binds galaxies into _____ and _____.

19. Our Milky Way galaxy is approaching Andromeda at the rate of about a quarter of a million kilometers per _____, which means that in 5 billion to 6 billion years, it's all over for the Milky Way galaxy.

20. Ultimately the Milky Way and Andromeda will combine into a new galaxy. Describe its shape.

21. Dark energy has the opposite effect of dark matter. Instead of binding galaxies together, it _____.

22. Dark energy will cause galaxies to move further and further away from us until they are _____, until they are moving faster than the speed of _____

Conclusion

1. Describe how the Milky Way has evolved over the last 13 billion years.

2. Explain the term "Galactic Goldilocks Zone".