

Introductory Astronomy

NAME:

Homework 29: The Large-Scale Structure of the Universe: Homeworks and solutions are posted on the course web site. Homeworks are **NOT** handed in and **NOT** marked. But many homework problems ($\sim 50\text{--}70\%$) will turn up on tests.

1. Did you complete reading-homework-self-testing for the Introductory Astronomy Lecture (IAL) by the weekly due date?

a) YYYessss! b) Jawohl! c) Da! d) Sí, sí. e) OMG no!

2. “Let’s play *Jeopardy!* For \$100, the answer is: These objects are themselves grouped into larger structures: clusters (poor and rich), superclusters, filaments, sheets and, in a zero or near-zero population sense, voids.”

What are _____, Alex?

a) spiral arms b) galaxies c) H II regions d) black holes e) bulges

3. The Milky Way belongs to a poor irregular cluster called:

a) the Great Void. b) the Virgo supercluster. c) the Virgo cluster. d) Our Gang.
e) the Local Group.

4. The nearest rich cluster contains over 2000 galaxies, covers about $10^\circ \times 12^\circ$ on the sky in the constellation Virgo, is about 15 Mpc away, and has a diameter of about 3 Mpc. It is an irregular cluster. It is called the:

a) Local Group. b) Solar System. c) Coma cluster. d) Virgo cluster.
e) Norma cluster.

5. Superclusters for the most part do not seem to be gravitationally bound systems. If this is so, then their component clusters will:

a) progressively move apart with the expansion of the universe. b) stay close together forever.
c) collapse to form supermassive black holes. d) collapse to form a single supermassive black hole.
e) empty into the Void.

6. These structures, which are roughly spherical, are of order 30 Mpc to 120 Mpc in diameter. They are rather empty, but may contain hydrogen gas and strings of dim galaxies. They are called:

a) voids. b) vaults. c) vandals. d) vents. e) vultures.

7. “Let’s play *Jeopardy!* For \$100, the answer is: The large-scale structure of galaxy groupings is often described by this adjective.”

What is _____, Alex?

a) snowy b) solid c) web-like d) creamy e) joky

8. In the formation of elliptical galaxies, the orbits of the stars are randomized (almost always by mergers it seems) and the galaxy becomes quenched (i.e., star formation turns off or nearly off) typically on the time scale of gigayears. Gas in quenched elliptical galaxies:

a) has collapsed to form a supermassive black hole. b) is too hot to form stars. c) vanished into thin air.
d) mutually annihilated. e) dissolved into helium.