

Putting the Universe and Milky Way in Familiar Scales
Astronomy Tidbits and Info compiled by Margaret Race

See below for:

- 1) the full citation about sand grains and size of the universe.
- 2) another nice example using atlas pages and the Milky Way.
- 3) another item on the size of the solar system, the galaxy and beyond

1. The size of the universe and the number of stars (in SAND GRAINS!)

"Imagine that each star in the known universe is represented by a single grain of sand. A thimble would hold all the starts visible on a clear, dark, summer night. A large construction wheelbarrow would contain the Milky Way, the galaxy in which our sun resides. But to demonstrate the immense number of stars in the universe, we need a freight train with hopper cars filled with sand. As the train begins to speed by us at a level crossing, we count the cars while we wait. The cars roar past, one per second. We would have to keep count 24 hours a day for three years before the universe train had completed its pass."

(From Extraterrestrials: A Field Guide for Earthlings by Terence Dickinson and Adolf Schaller. Camden House Publishing, Camden East, Ontario 1994.)

2. The size of the Milky Way (our home galaxy)

"The Milky Way is a mighty big affair, and scientists who restricted their attention to it alone would be in no danger of running out of subject matter. If, for instance, we had an atlas of the Milky Way that devoted but a single page to each star in our galaxy, so that the sun and its planets took up just one page, merely to flip through that atlas at a rate of one page per second, without taking so much as a daily coffee break, would consume 10,000 years."

(From "The Three Immensities", by Timothy Ferris. In Forbes ASAP magazine, November 30, 1998. Page 140)

3) SOLAR SYSTEM in the MILKY WAY

Many folks have seen or heard demonstrations of the size of the solar system using scale models of the Sun and planets. It may be a little harder to envision how the solar system fits into the Milky Way galaxy, which has perhaps 200 billion stars in it. Try this:

If our Milky Way galaxy were shrunk down to the size of the United States, about 3000 miles in diameter, and then overlaid on top of the U.S., then:

- 1) the Sun would be a microscopic dot, about 3 ten-thousandths (3/10,000) of an inch in diameter, located in, oh, say, Ohio.
- 2) the Earth would be about 3 millionths (3/10,000,000) of an inch wide, located about 1/32 inch from the Sun.
- 3) Pluto would be about an inch from the Sun.
- 4) the nearest star to Earth would be about 700 feet away.

Okay, feeling small yet? Next, remember that the Milky Way is only one of perhaps 100 billion galaxies in the Universe. Then go do something nice for our planet, or for someone on it, 'cause like it or not, we're all in this together.

(source: unknown)