HOW BIG IS THE UNIVERSE?

LL 8/01/02

Your Mission (SYDTAI): Get a grip (slippery though it might be) on the size of our local star system, The Milky Way Galaxy (TMWG), and using this awareness, also get a feel for the size of The Entire Visible Universe (TEVU).

Let's start small by taking a tour of all the stars in TMWG, visiting each only once.

You will visit each star for 1 second and then take 1 second of leisurely travel time to the next star.

Every minute you will visit 30 stars, every hour 1800, every day 43,200, every month 1,296,000 (number in a typical globular cluster), etc.

Now let's say that you will commit to doing this star hopping for 24 hours a day for an entire adult lifetime of 50 years. You sure would visit a lot of stars in this time (3/4 billion).

But we said you were to visit ALL the stars in TMWG and so far you have only seen **1/5th of one percent** of them.

In fact it would take you another **500** such dedicated lifetimes to visit every star in TMWG, just once.

This would be a total of 25,000 years, which is close to one cycle of precession of the Earth. During this time TMWG would have turned 1/10,000th of the way around its rotational cycle (or 1/27th of a degree)

Now wasn't that really fun?! So let's go explore another whole galaxy (say the galaxy in Andromeda), in another 500 lifetimes. ZIP!! ZAP!!! Done! No problem yet. If you keep this up long enough you can explore TEVU, right?

Well… if you were to continue this 2-second-per-star exploration for the entire estimated age of the Universe (25 billion years), you would be able to explore all the stars in one million galaxies. Unfortunately this is only **1/1000th of one percent** of all the galaxies visible to the Hubble Space Telescope.

My oh my, what to do now?? There's only one possible solution:

Using Hyper-Virtual-Reality Perception Enhancement Processing (HVRPEP) let's say you are able to cut your visit time at each star to 10 millionths of a second and your transit time between stars also to 10 microseconds.

You would then be exploring stars at the rather excessive rate (by today's somewhat limited standards) of 50,000 per second! (Translated into the form of sound waves, this frequency would be far above the human ear's ability to hear it -- in the high ultrasound range).

Doing this would allow you to visit every star in TMWG in only 3 months instead of 500 lifetimes.

And… you could indeed *visit every star in TEVU in 25 billion years*, the estimated age of the Universe. Yeah!!!!!! You did it!!

But how long is a billion years anyway? For one thing it's a million millenia. It's also 10 million centuries. And it's 20 million lifetimes of 50 years each.

So in summary, **at 50,000 stars per second you could explore TEVU in 500 million lifetimes**.

A pretty good test of patience, huh? Because if a dime represents one lifetime, 500 million lifetimes would be a row of dimes 5400 miles long… something like stretching from southern Mexico to northern Alaska (or if you prefer, 30 stacks of dimes each 10 miles high).

So, see you back here in 25 billion years, and I expect a full, detailed report with pictures!

On your mark… GET SET!… **GO!!**