

stardrive

The Whorl list — 1 messages, 1 voices, 03 Nov 1998

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m.driussi — 03 Nov 1998, 17:30

Re: questions regarding the stardrive that is pushing the Whorl.

Because the details in the text are so very few, the entire topic is wildly speculative.

By my reading, at least, it appears that the Whorl had a cruising velocity of .95 c, or ninety-five percent of light speed. This results in a time dilation factor of around 3:1, so that only one year passes onboard for every three years that pass in the universe at large.

To current "realistic" stardrive thinking, .95 c is so high that it is effectively "magic." Even the most energetic of "realistic" rockets, a photon drive (thrust produced by the mutual annihilation of matter and antimatter) with a Mass Ratio of 16 (so a one ton ship uses 15 tons of reaction mass--in this case, 7.5 tons [!!] of antimatter and 7.5 tons of matter) can only go .88 c in a voyage where the ship must come to a stop at the end (i.e., in a forever nonstop flyby this stardrive and Mass Ratio can maybe hit .9922 c).

An Ion Scoop, like that for the Bussard Ramjet (the great hope of the 60s), while an excellent model for "living off the land" and thereby avoiding those crushing Mass-Ratio figures, is currently thought to be incapable of surviving (or attaining) velocities over around .2 c.

So we are left with fringe concept NAFAL (nearly as fast as light) drives. The following appropriate the ion scoop's "living off the land" function: Milton Rothman's wormhole jet ("free" photons siphoned from nearby stars via wormhole); Clarke's quantum jet from SONGS OF DISTANT EARTH (perversely limited to .2 c anyway, due to interstellar friction); the tachyon drive of Haldeman's THE FOREVER WAR (using tachyons as exhaust for NAFAL travel); and Sheffield's quantum jet from THE MCANDREW CHRONICLES. There aren't enough details to say much about the quantum "spin-ships" of Dan Simmons's HYPERION, but they would seem to fall into this category; as would the NAFAL ships of Le Guin's Hainish novels.

(When dealing with these fringe concept drives, it occurs to me that even discounting Mass-Ratios, another barrier to cross is the fact that a ship travelling at .95 c has its mass multiplied by 3.2! So if your magic jet drive can push an asteroid up to .8 c [at which point it is really pushing 1.667 times the rest mass of the asteroid], to attain .95 c will require that the same drive push twice as much mass. So even magic drives have consequences.)

=mantis=

*This is WHORL, for discussion of Gene Wolfe's Book of the Long Sun.