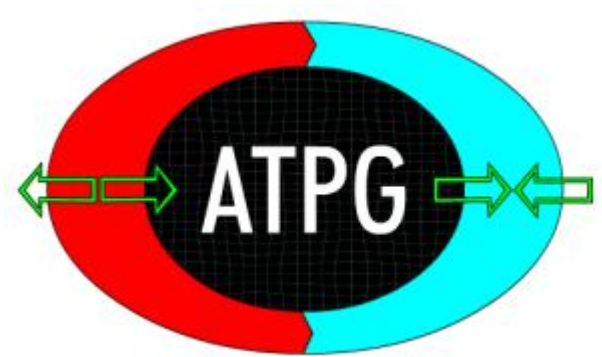


Advanced Theoretical Propulsion Group

The official newsletter of the Alcubierre Warp Drive Discussion Forum

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Group Motto: “*Ex Somnium Ad Astra*”¹

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¹motto established by Simon Jenks

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Editorial

I am plenty busy and well the group doesn't always have topics which can be easily translated into separate sub articles. It however may be possible for group members to send brief reports to be, so that I may include them in the newsletter as this would be a big help to me.



Figure 1: Main Engineering, NCC-1701-D Set

As is however, I will put out a newsletter every two months as opposed to every month do for sometimes lack of material, but more importantly a time saver to me. I am glad that luminal exploration of the warp drive is almost complete so that we may focus on the more practical concerns of negative energy production, is it possible, and if so how.

-eh

Table 1: Warp shell numerical evaluations.

r_s	R	σ	$f(r_s)$	$S(r_s)$	A
0	50	0.1	1	0	1.023
10	50	0.1	0.9997	0.0002	1.1825
20	50	0.1	0.9997	0.0023	3.4228
30	50	0.1	0.9997	0.0178	8031
40	50	0.1	0.9976	0.1191	3.0×10^{25}
50	50	0.1	0.5	0.5	2×10^{75}
60	50	0.1	0.1192	0.8807	3.9×10^{25}
70	50	0.1	0.0179	0.9820	4.16×10^{15}
80	50	0.1	0.0024	0.9975	140.5
90	50	0.1	0.0003	0.9976	1.9956
100	50	0.1	4.5×10^{-5}	0.9999	1.0950

FTL Drive

Contributor: Loup, et al.

One of the biggest problems of the warp drive from the mathematical perspective is that once a warp drive becomes luminal it is causally disconnected to the manifold $M(g_{ab})$. That is to say as the warp drive space ship reaches the speed of light or above it is no longer capable or reducing to sublight speeds or even to increase in speed, because then the local curvature is no longer a subset of M. The Group Project is nearing completion, where it is possible to construct a partial subset of M so that a warp drive space ship has the potential to drop out of warp or to increase velocity. However there still remains an outer horizon, such that the new warp drive behaves as a partially trapped horizon, which is better known as a wormhole. What the group discussion have left is a spacetime which is described by

$$ds^2 = -[A^2 - (v_s \mathcal{S}(r_s))^2]dt^2 + 2v_s \mathcal{S}(r_s)dx'dt + dx'^2 \quad (1)$$

where $[A^2 - (v_s \mathcal{S}(r_s))^2] = H(r_s)$, being the definition of spacetime where a horizon has the potential to form. By simply modifying three functions, f , \mathcal{S} , A , at no where $g_{00} = 0$, thus $H(r_s)$ is forced to have some positive value and thus there is no luminal horizon as seen from the ship.

Giving large values for A also acts to lower the negative energy requirements even further, and thus making the warp drive look a little more realistic. However, it is up to a future work to determine if large amounts of negative energy within spacetime can be generated, if not all we have is an interesting model, which may further serve as a tool in understanding general relativity.

UFOs: Did you get the License Plate Number?

Contributor: The Club, General



Those people have seen something. What it is I do not know and I am not curious to know.

-A. Einstein, Letter to L. Gardner July 23, 1952; source: The Quotable Einstein 1996 (Princeton: Princeton University Press)

Unidentified Flying Objects, are generally objects which appear to possess aerodynamic capabilities which an observer may be unfamiliar with. The above quote by A. Einstein sums up about what the scientific community comments on UFOs; being they are non issues and are no more interesting than mermaid sightings. The tricky issues come up when one has the tendency to believe that some UFOs may be piloted by “little green men,” or what ever your preferences may be. To paraphrase from the great science fiction author Arthur C. Clarke, if there is no license plate from Mars I am not interested in talks of beings from other worlds.

Now for club discussions UFOs from other worlds are interesting as it could mean FTL travel is in deed possible, there certainly isn't anything scientifically to rule them out. However, scientifically there is no way to even say it's even a real possibility with todays knowledge, it is much like asking how many angels can dance on the head of a pin, so science requires dramatic proof for such a dramatic claim. If for argument sake there are UFOs from other worlds in our skies, what good does that do? If we wish to travel to the stars we have to rely on ourselves, but if there is some smoking gun, a license plate discovered then we have quite another story. If we want to know if it's possible to reach the stars, we must dust up chalkboards, we must get our hands dirty from engine designs. We must forget the speculation and rumors about ET, we must set out and boldly go where others have only dreamed.