IRANIAN EINSTEIN ?

Mohammad Mansouryar on Warp-Drives & Traversable Wormholes

By Tim Ventura & Mohammad Mansouryar, January 27th, 2006

He's been called "The Next Einstein", and with good reason – Mohammad Mansouryar's vision of the future of space-travel extends General Relativity to encompass traversable wormholes as the basis for a true warp-drive technology. His research highlights the international impact of emerging concepts in breakthrough propulsion physics, and he joins us to talk about mankind's moral-imperative in the stars.

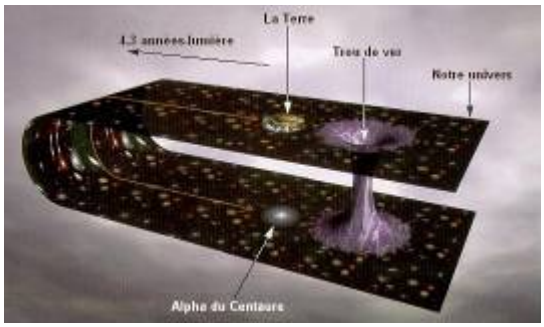
AAG: Let's start out with your background, education, and how you got interested in BPP physics research. Can you tell us a bit about yourself, and the vision that you have for building an FTL drive?

Mansouryar: Thanks Tim. I was born on November 22nd, 1983, in Karaj, Iran. My interest in weird things started back when I was a kid from reading books about the Bermuda Triangle, UFOs, alien contact reports, and any other unexplainable scientific phenomena. After a while, I decided to dedicate my life to "do" something about them. For example, it wasn't (and isn't) acceptable to me to just theorize or be impressed simply by the power of extraterrestrial beings more intelligent than ourselves. If we can imagine their technology, then we have a responsibility to realize that imaginative dream as soon as possible!

Traversable Wormhole: Mansouryar believes that wormhole travel is possible.

Thus, I started by reading popular manuscripts about physics - especially relativity - when I was about 16. I was then chosen to study atomic physics in the most religious city of Iran. Spending 3.5 painful years there showed me the value of freedom and human rights. You see, I've passed through much hardship, and I consider my paper the fruit of my scientific life up to now. I've written it from the heart, making it more than just an intellectual exercise.

As to the second part of your question, I think that you can draw a correspondence between the communication of digital and analog information to the communication of physical objects through space if we can construct a practical form of FTL physics. I don't want to limit the application of this physics to just spacecraft, but as I've stated to many people, the final aspiration is reducing the "pain of physical distance" to humanity, in any manner one can imagine.



Traversable Wormhole: A wormhole is basically a shortcut through space-time.

Consider this: there's no practical impossibility for humanity to send and receive movies, voices or photos by utilizing current information technology. You can be in a multimedia contact with just about anyone via a tiny mobile phone. Now generalize this situation to enable people to send and receive themselves or any other macroscopic physical

objects. That is the power of future FTL technology based on space-time distortion as I see it.

AAG: You recently published a paper entitled, "On a macroscopic traversable spacewarp in practice", in which you mention a moral imperative to build a warp-drive -- can you elaborate a bit on what this moral imperative means to you?

Mansouryar: It's generally understandable that if one decides to dedicate his/her "life" to something that their sacrifice should really count, and ought to make a practical difference. This is subtle difference between the crazy person and the visionary. The crazy mostly lean to fictitious concepts, but the true visionary always keep an eye on reality, even if their methods are sometimes perceived as crazy.

When I chose my project, I wanted one that was described within a real model of physics accepted by the scientific community. I decided to focus on the most challenging ideas in science and I fell in love the concept of wormholes. I felt the idea of traversable wormholes is so elegant that we can't ignore the challenge of making it real. So I searched (mostly in published papers of arXiv.org) the findings of recognized experts to find a practical way to achieve this.

If you're attempting to develop a technology comparable to UFOs and similar topics, your first goal should be nothing short of reducing the path of travel in space. It doesn't matter how you do it, by inter-dimensional traversing or space-warps, but notice that both solutions focus not on increasing the velocity but circumventing the usual path of travel. As evidence, cited in many websites, consider only the distant separation of our solar-system to the next nearest star – how can merely building a faster rocket make any real impact in traveling such vast distances? FTL travel is the only real answer...

Wormhole Drive: This graphic from NASA's BPP Project, who investigated the concept.

AAG: What's it like living in Iran, and being interested in science & technology? Do your scientific interests create any conflicts with popular cultural values in the area? For instance, in the USA we see a lot of friction between the UFO community and the government, and I'm wondering how Iranian culture views & addresses trends in emerging technology -- especially those still on the edge of known science?

Mansouryar: The face of the next Einstein?

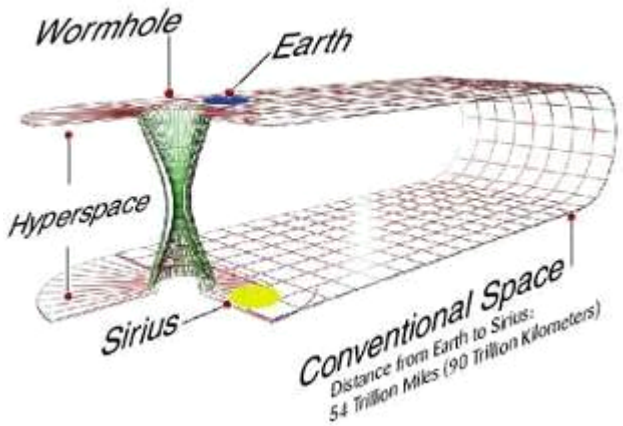
Mansouryar: Extremely difficult, and nearly impossible if one wants to present something new and isn't thinking about emigrating. Iranians think I'm a fool who lives only in his dreams. If anybody takes himself too seriously in that condition, I guarantee you can consider him (at least after a while) a real fool! Also, the entrance of modern technology to our Iran's traditional society has caused many enormous anomalies & concerns.

AAG: The core idea in your paper was the concept of creating traversable wormholes for Faster Than Light (FTL) travel. Can you give an overview of how you arrived at this concept as the best means for FTL-propulsion, and tell us about the new space-time metric you derived for this approach?

Mansouryar: As I've said before, the primary focus of any effort should be concentrated on distance reduction. Disregarding cosmic strings or falling through a rotating black hole, there are 3 proposals for FTL travel within general relativity which have this appeal: traversable wormholes, warp drives and the Krasnikov tube. The former is a casually corrected version of the warp-drive, and the traversable wormhole is my top pick.

Maybe it's interesting to you Tim, but the metric I've derived is none of the above! I've called the proper, practical space-warp a "virtual pregnant worm"! Well, what does that mean? The best TW metric before the publication my paper was by P. K. F. Kuhfittig, who's model requires relaxing the tidal forces on the living passengers. In addition, his model provides better conditions than Alcubierre's requirement for exotic matter.

Speaking of which, what killed Alcubierre-Broeck warp bubble (ignoring the difficulty of creating Exotic Matter) was the drawback of not addressing basic control in superluminal velocities. Thus, I thought maybe the combination of traversable wormholes with warped bubbles of space-time might work.



Space Shortcut: Reducing travel distance with a wormhole means drilling through curved space-time.

If you combine these concepts using basically 'mathematical surgery', the resulting model will produce a complicated space-time curvature. The embedding figures show a result that looks a lot like a pregnant worm. Now, you might ask, "why a worm and not a wormhole?" The answer comes from imposing the fuzzy logic to control the various aspects of the propulsion system.

It may seem trivial, but maintaining space-time stability is the most vital part of using a space-warp, especially for traversing living passengers. I've suggested that using nonlinear control theory is the best for choosing navigational courses (like a complex dance!) and for adjusting the pump-frequency of the EM field to send its 'baby' to departure. What baby am I talking about? In this case, I mean the warp-driven spacecraft itself, traveling through the tube of modified space-time. Thus, we've created a true warp-drive!

Equation #7 in my paper still denotes this as a traversable wormhole, but I've been modifying one of its parameters in the hopes of completing the warp-drive element of the required Virtual Pregnant Worm (VPW) in space-time. Thus, it shows the 'baby' still needs some mathematical-surgery, but the mommy is OK!

Indeed, a VPW features the benefits of both traversable wormholes and warp-drives. Through the distortion of space-time (TW), and by applying extraction-contraction mechanism through a bubble (WD) on the background of that distorted space-time, we can first circumvent the path by a shortcut (TW), and then pass through that shortcut by a slow WD (i.e., its velocity must be less than c). That can reduce the size of the wormhole's throat - because we're interested mostly in one localized region where travelers are placed - and relax it to have better energy

implications also. This model uses a slow space-time bubble to minimize the control problems of fast warp-drives.

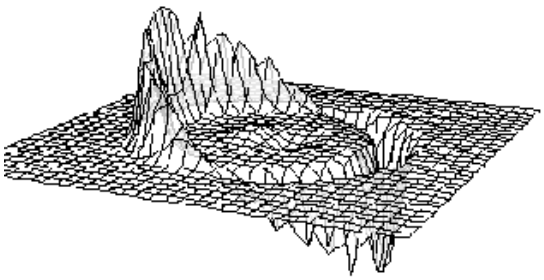
Finally, I've tried to complicate the last model of Prof. Kuhfittig by making it axially symmetric, dependent to dynamic factors, dynamic functions and eventually dependent on the back-reaction of charge contribution. Adding all of these factors leads to powerful approach for cutting off the geometry wherever is necessary, which in turn leads to a model for TW element of a VPW with the least known geometrical flaws.

Warp-Drive: Mansouryar's theory integrates wormholes and the Alcubierre drive concept.

I'd guess that we could start experiments by traversing some strategic items like gas or oil, and after finding a bit economic justification, we'd be ready to send humans to wherever they want with the least possible travel-time. Obviously, the initial region of operation would still on the earth, and novel legislation would be required to help the business evolve. This could be achieved in a step-wise fashion: with step one being travel within a country, step two being travel between countries, step three being travel between colonized planets, and so on. This type of travel has lots of implications – for instance, I'm sure FBI wouldn't like to consider the entire world's population as potential suspects in a criminal investigation! We should get ready to live in a world with a fundamental redefinition of the term 'physical distance', and for the many implications of this new type of freedom.

AAG: How would a spacecraft based on your vision operate? Would it basically disappear in one point in space and re-appear in another, or would it appear to actually move faster than light, perhaps like the Star Trek series often portrays?

Mansouryar: The correct description is your first description, "disappearing at one point and re-appearing at another". It may seem like some kind of magic, but combine the separate visions of a spacecraft based on traversable-wormholes and subluminal warp-drives, and you'll see the right picture.


Bent-Space: The Alcubierre drive is always falling forward into an artificial gravity-well.

AAG: Have you made it to the point of building any hardware yet, and if not, what are some of the problems that you envision with this?

Mansouryar: No. The scheme completely hinges on the violation of the Average Null-Energy Condition (ANEC) as a required initial starting condition. The best material for the required resonant cavities is "stable metallic hydrogen". Unfortunately, this substance isn't commercially available, and the observed metallic hydrogen in the lab has been unstable as far as I know. However other structures are possible.

More theoretical research is necessary into the phenomenology of what a light ray would encounter in an asymmetric perforated configuration of cavities. It relates to our more understanding of the nature of photon and non-geodesic null curves in such conditions.

I'm ready to perform the preliminary tests in a suitable lab, and I estimate the necessary budget for that experimental phase shouldn't exceed more than $10 million dollars. Unfortunately, conventional scientific funding levels are simply too low for a project having such dimensions.

Alcubierre: The best-known example of this drive is from the fictional Star-Trek series.

AAG: Does your research involve any work with superconductors, large EM fields, or other exotic technologies? I'm wondering how these might come into play in your designs, and if you have any prior experience working with them that might help in the construction process?

Mansouryar: Yes. We need to minimize the loss & dissipation effects. I've suggested using long carbon nano-tubes in the circuits for conducting the electricity. Also, large electromagnetic fields could give tremendous contributions after trapping a pulse of ANEC violation. That's the case, mostly in high-energy nonlinear metrics. My scientific inspiration to that end was the work of Prof. Kim, however after publishing my research, I stumbled across a paper of Prof. Davis that should also be considered.

Also, my old personal inspiration is the "Philadelphia Experiment" done by the US Navy in 1942. I don't care about its scientific validity, but the story itself had an astonishing emotional impact on me when I was a kid. I can talk more exactly after some experiments.

AAG: As a result of the physics you're working with, it appears that the production of exotic matter is a key component to actually constructing a working drive-system. Can you tell us a bit about how this might be achieved, given the controversy surrounding whether exotic matter can even exist?

Mansouryar: The existence of negative energy density is a known fact, shown by many accepted experiments. Let's describe it more technical terms: what we really need is a violation of Average Null Energy Condition. Its experimental demonstration is the detection of a deflected light in somewhere of space-time, which means we've created a curved region in space-time.

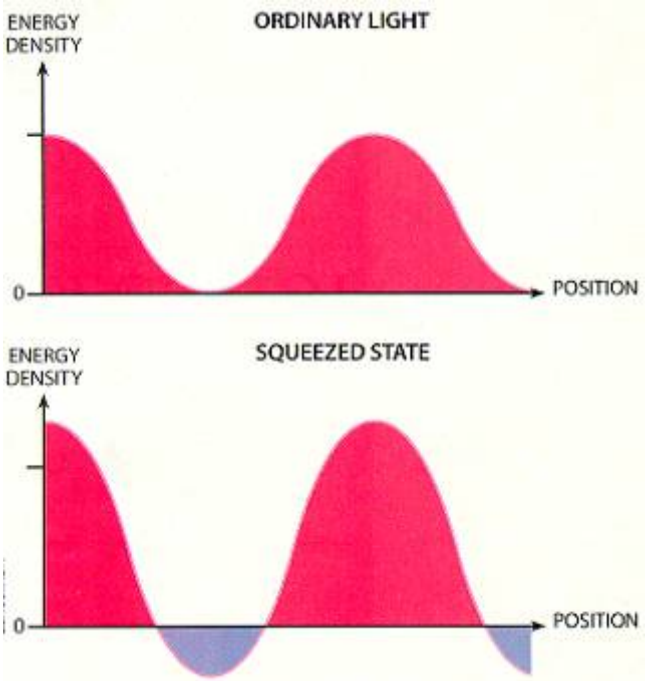
I'm considering more theoretical work on the information-theory description of the configuration and possible role of squeezed vacuum-states on primary points and further manipulations of arranging the involved light-like rays. I've recently been feeling the discoveries of the Nobel prize winners of the year 2005 might be useful to that end. Also, I'm considering several engineering designs by myself and others to provide better a explanation of extracting the ANEC violation matter from an asymmetric perforated system of cavities and eventually from free space.

AAG: Do you see any loopholes in the requirement for exotic matter, possibly through EM/gravitational couplings in Unified Field or String/Brane Theories?

Mansouryar: I'm not in a position to answer this question. I care mostly to the results of existing experiments.

AAG: What are your thoughts on string & brane theory? They've encountered a lot of criticism for not having experimental validation, but they do seem to offer unique insights into the unification of force. Will these theories be vindicated, or are they yet another dead-end in the quest for a true "Theory of Everything"?

Mansouryar: Perhaps, my theory is useful for the verification of gravity predictions in sub-millimeter scales and the role of possible extra dimensions. However, my personal belief is that we need to focus on the philosophical principles of a 'Theory of Everything' (TOE). Maybe the Gödel theorem-like in logic could be applicable in physics. By the way, I really don't want to theorize about everything Tim. I'd love a more practical role in something exciting, like being a manager on a Mars colonization project!



Squeezing Space: In this state, the energy density at a particular point in space can become negative.

AAG: America was founded largely by pioneers exploring what to them was the vast unknown, and I think that this spirit gives BPP & AG research an edge in our country against some of the pessimism that we see in mainstream science. I'm wondering if Iran has a similar pioneering spirit, and if so, do you see space exploration in your country's future?

Mansouryar: Forget it Tim, such a thing is more like a joke for Iran. Next question please.

AAG: Let's talk about government, business, & university interest in BPP & Space technologies -- do these exist in Iran, and can you tell us about the public & private infrastructure in emerging physics & technology in the country?

Mansouryar: Ha, ha, ha. It's a very funny question. When even NASA cuts its funding for BPP projects, how can I complain about similar attitudes in here in Iran? Hey man, don't forget the power of money.

AAG: Can you tell us a bit about the people that you work with -- any favorite professors, mentors, or groups that you've collaborated with on your research?

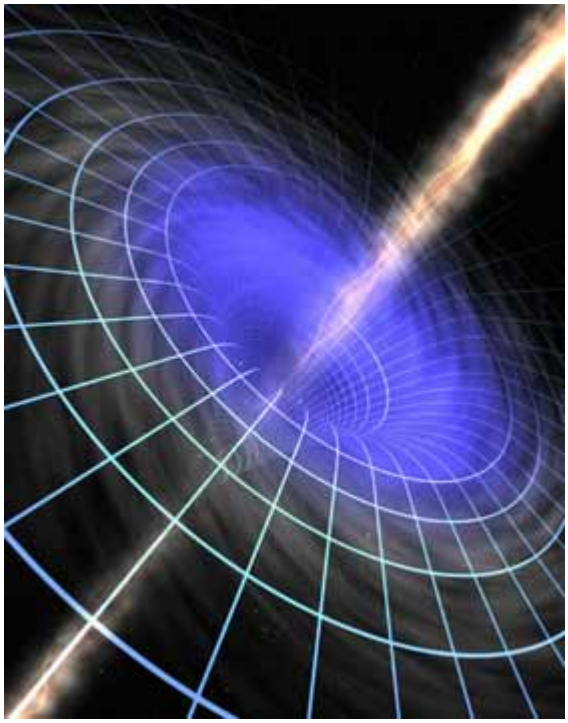
Mansouryar: Really nobody locally, but virtually (via the internet) there are some very supportive & intelligent people whom I'm in contact with.

AAG: What are some of the other papers that you've written, and what are some topics that you plan on writing about in the future?

Mansouryar: My previous papers were mostly just exercises in how to upload a paper to arXiv.org! They also contained some peripherally-related ideas I felt might be interesting. At the moment, I'm waiting to see the feedback of my primary paper from the experts – and I'm looking forward on seeing new online publications on traversable wormholes and the Average Null Energy Condition. After that I plan on extending my efforts to describe the features of a space-warp in much greater detail.... at least if this research doesn't end up being classified!

AAG: In our growing international BPP community, France, Russia, and China have all been getting publicity lately for innovative theories & research relating to advanced propulsion concepts. Are you seeing any involvement from those countries yet, or has your work been mostly relating to research from the USA?

Mansouryar: The United States is in a unique position to lead this research, although a French acquaintance of mine recently expressed some interest in verifying my theory experimentally in his laboratory. I don't have much information on the research you'd mentioned in China, but I agree with most people that Russia has great theoretical physicists – doing more than we probably might guess in moving this research forward...



TW Travel: The warp-drive falls through the tunnel in space for near-instantaneous travel.

AAG: Let's close with your contact information -- how can people best get in touch with you to learn more about your research?

Mansouryar: Through my two emails: mmmwormhole@yahoo.com or alternatively at info@mansouryar.com. At present I'm really hoping to receive emails from potential investors, in addition to serious technical dialog about ANEC and VPW within standard General Relativity Theory. For the general audience, my website "www.mansouryar.com", along with this interview, should answer enough non-technical questions to get everyone started.

Also, I'd greatly appreciate any opportunities to present my paper to a wider audience, maybe through hyperlinks, forum discussions, interviews, and media interest. With greater exposure, I hope that others can share the passion I have for space-warps & traversable wormholes, and build upon my existing work to develop an even better theoretical framework in the future!

Mohammad Mansouryar is an independent researcher located in Karaj, Iran. His research includes advanced work in General Relativity & Applied Wormhole Mechanics. You can visit his site online at the following URL: http://www.Mansouryar.com, and see his paper on traversable wormholes online at arXiv.org.