

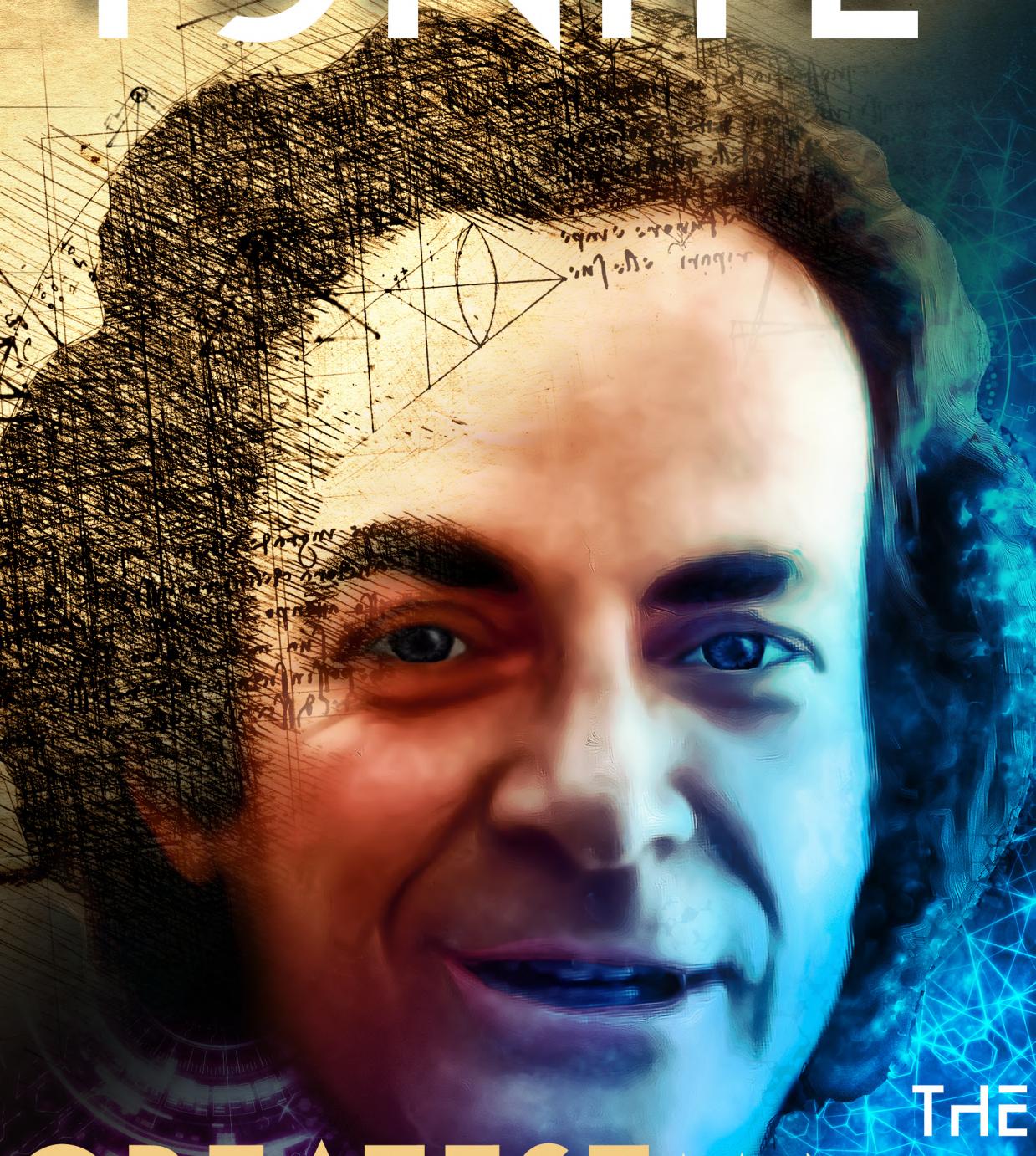
ACHIEVING THE IMPOSSIBLE  
INTERSTELLAR TRAVEL? UNLIMITED ENERGY? TIME  
TRAVEL? A GALACTIC EMPIRE?  
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UNIVERSE - THE STORY  
SCIENCE MEETS SPIRITUALITY TO ANSWER  
THE UNIVERSE'S MANY MYSTERIES...  
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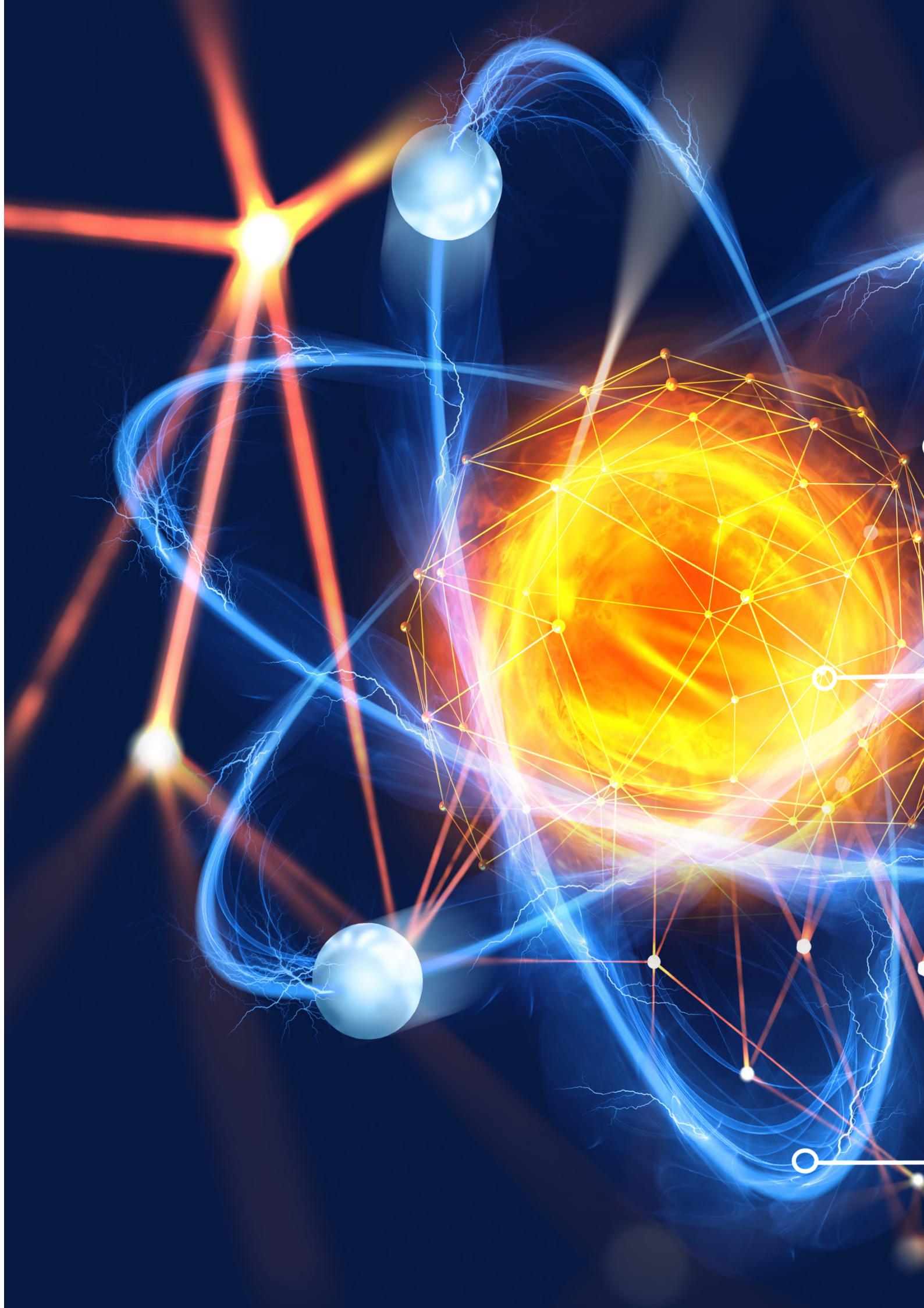
EMERGING TECHNOLOGIES OF 2021  
TECHNOLOGIES THAT WILL CHANGE YOU, YOUR  
LIFESTYLE AND THE WORLD YOU LIVE IN  
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# iGNITE

NOVEMBER, 2020



THE  
**GREATEST MINDS  
SINCE EINSTEIN**  
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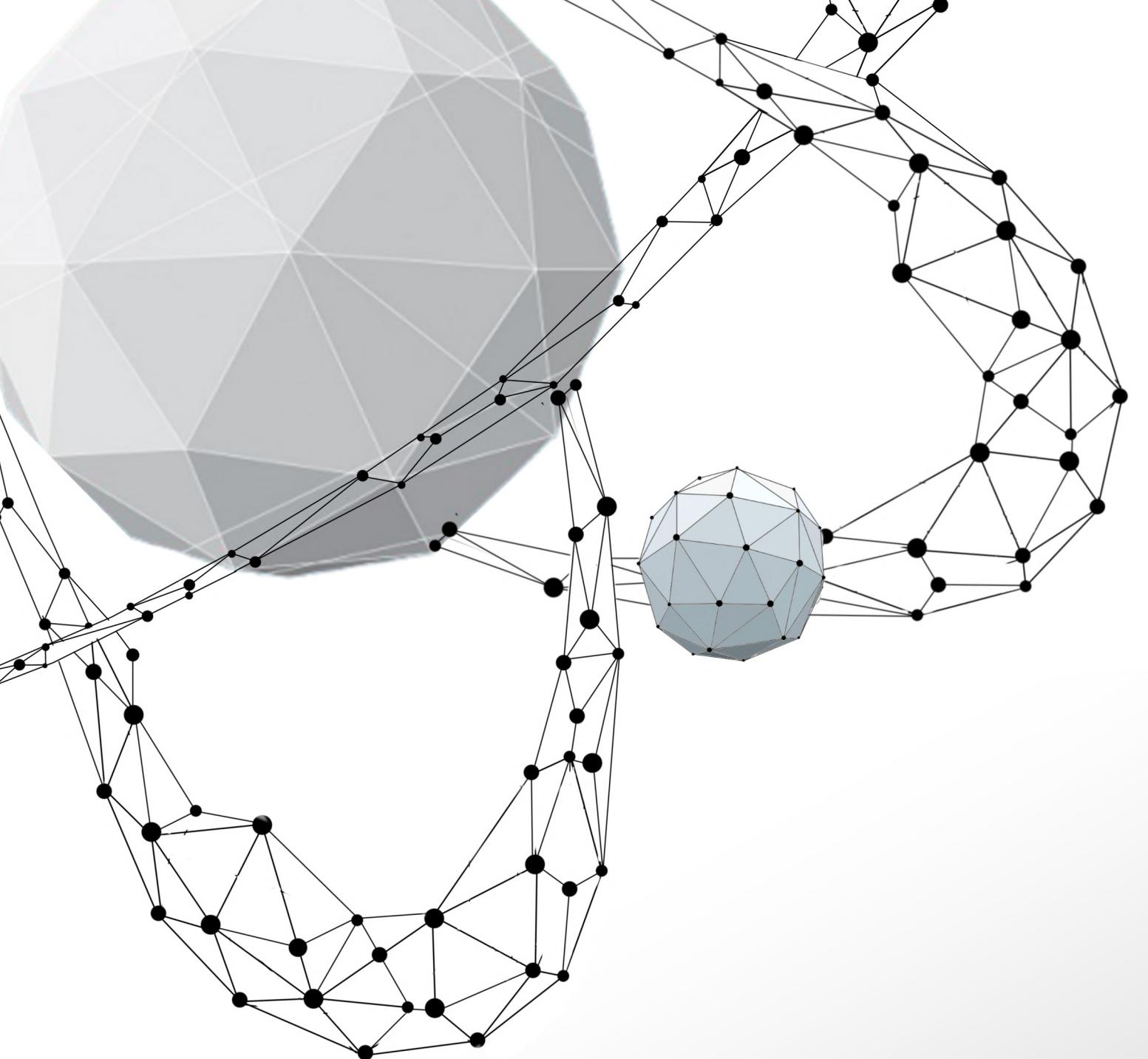
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Science meets Spirituality to answer the Universe's many mysteries...

# Editor's Note

Hello,

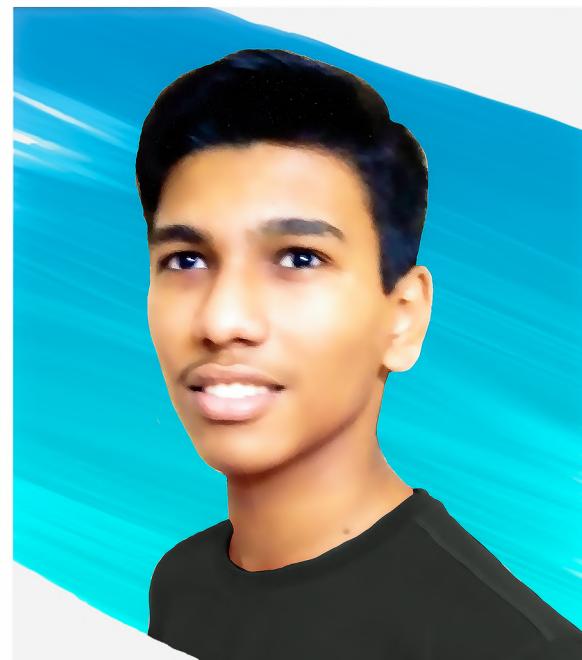
We welcome you to the first issue of the IGNITE magazine! Science and Technology always amazes me, be it talking about things from the future or the mind-blowing advancements of today. My purpose of creating this magazine is to share some of the wonders of Science with you. I am a big fan of Physics and Technology so that's what you will read a lot but don't get demotivated because I have tried my best to integrate the articles into many subjects, be it Science Fiction or Spirituality.

This issue I am more focusing on igniting the passion for Science inside all readers. This issue, I will take all of you to a breathtaking ride through some of the emerging technologies today, unbelievable theories of time travel, relativity, travelling faster than light and much, much more!

I once again thank all readers for choosing our magazine and believe me, we won't disappoint your expectations. So before I let the Schrodinger's cat out of the box, lets jump in!

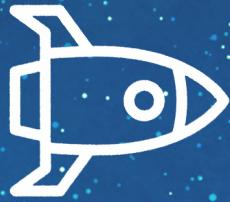
With regards,

*Narendra Aironi*  
Editor, IGNITE Magazine



IF YOU CAN'T EXPLAIN  
SOMETHING, YOU DON'T  
UNDERSTAND IT WELL."  
-EINSTEIN

ACHIEVING  
THE  
IMPOSSIBLE



UNLIMITED  
ENERGY?  
INTERSTELLAR  
TRAVEL?  
TIME TRAVEL?  
GALACTIC  
EMPIRE?

-NARENDRA AIRONI





# ACHIEVING THE IMPOSSIBLE

The most exciting phrase to hear in Science, the one that heralds new discoveries, is not "Eureka!" but, "That's funny!"

-Isaac Asimov

Radios, X-rays, computers, rockets Things which people considered impossible yesterday have become a lifestyle today! Same is the case with the mind-blowing technologies from Science Fiction. In this article we take a breathtaking ride to understand Science's deepest mysteries and unravel some of the most futuristic things scientists are busy creating.

One of these challenges has been to create a source of cheap and unlimited energy. The 'International Thermonuclear Experimental Reactor' project (ITER) has made huge progress on this line. The project has been in construction in Southern France ever since 2007 and will become the most expensive Scientific Endeavour ever, costing around 65 billion US dollars.

Normally, nuclear generators split the atoms of radioactive material like Uranium to generate energy but this is dangerous, polluting and expensive. Contrastingly, ITER will use nuclear fusion, which fuses two atoms of Hydrogen Isotopes, to release energy that is 4 million times that generated by the burning of coal! Unbelievable, right? But theres more to it.

To achieve this huge feat, ITER will need to attain temperatures 10 times hotter than the Sun (150 million degrees Celsius)! Now many might say, "Ahh, This will harm the nature so much!". But it won't because, nuclear fusion does not release any kind of harmful or radioactive waste. In fact, ITER uses normal sea water as a fuel.

Also, this is completely safe because even if a single bit goes wrong, this whole system shuts down automatically, causing no harm. Scientists predict that ITER will generate 10 times more energy than that it produces — If 50MW of power is injected, it will output 500MW of energy in barely 500 seconds! This is enough to light up an entire city!

Considering the progress made so far, it is estimated that the ITER will be fully functional by 2035. So quite a bit of time, but until then, there are huge breakthroughs being made in the field of interstellar travel, teleportation and Time travel! This is nothing less than Sci-fi come true!

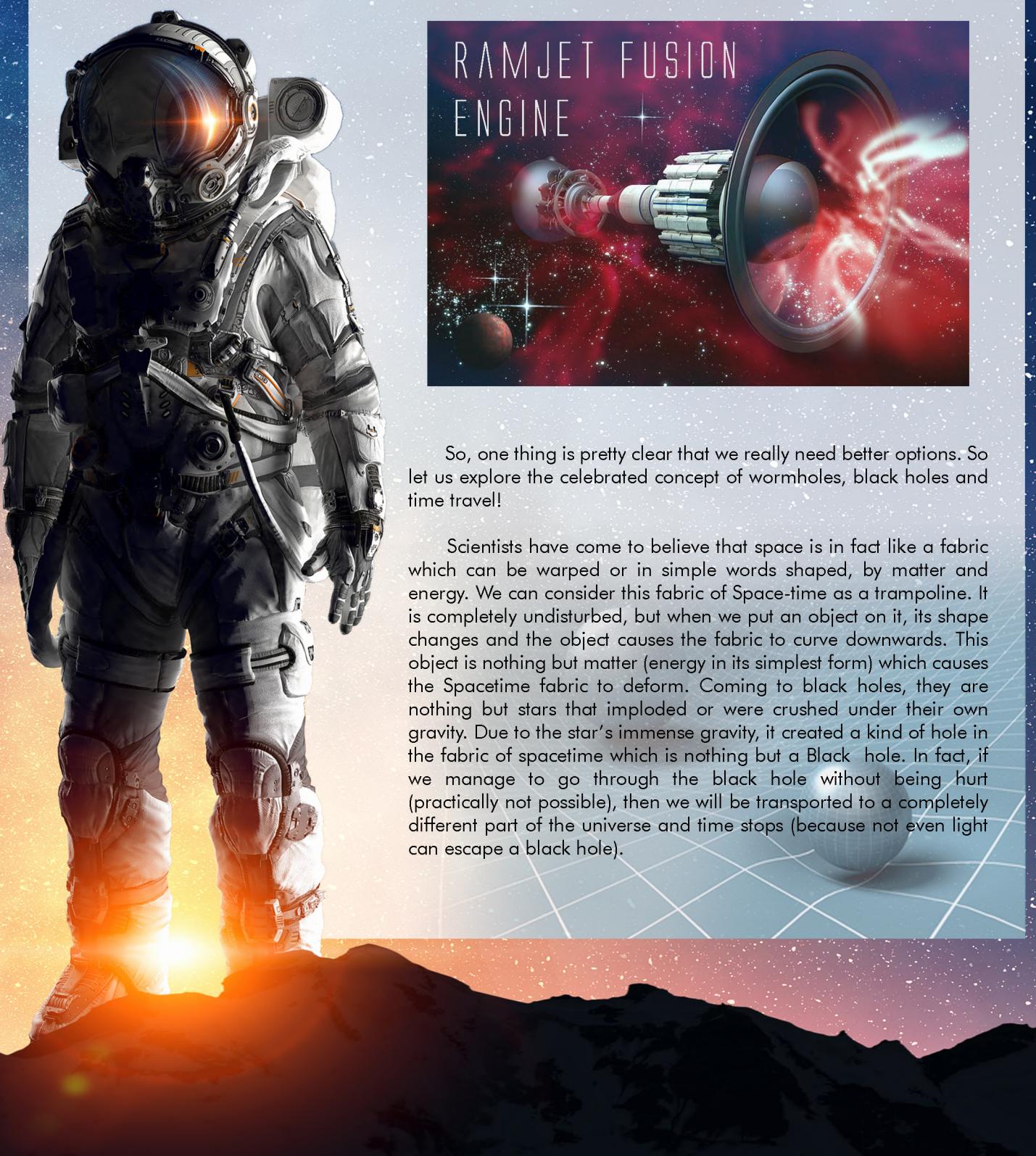
Wouldn't it be great to venture into unexplored places in the universe just like in Star Trek or Star wars? The problem is that the Universe is big. Even that's an understatement because it would take NASA's fastest spacecraft, Horizon 1 (travelled at a staggering 50,000 kmh), 30,000 years to barely get out of the solar system! The only plausible way to venture out fast, is to attain speeds near to the speed of light (around 300,000 m/s). But this has its own drawbacks. According to Einstein's theory of special relativity, as you reach the speed of light, time literally slows down, your mass starts to increase exponentially and everything starts to stretch out. Infact, at light's speed, time completely stops and your mass and size becomes infinite, and this is why it is impossible to do so.

We know that space is filled with Hydrogen gas which is also used as a fuel for rockets. In 1960, a scientist, proposed the design for a Ramjet engine that can 'scoop out' hydrogen from the space and use the earlier discussed nuclear fusion on a small scale to produce energy enough to propel the spacecraft. Even if the ramjet engine is able to attain 10 m/s<sup>2</sup> (fairly easy for rockets), then it will be able to achieve 77% of light's speed within a year. Everything seems good, until now because the earlier mentioned scoop will need to be 150km in diameter to make this a serious possibility which no wonder is not possible on Earth.



So, one thing is pretty clear that we really need better options. So let us explore the celebrated concept of wormholes, black holes and time travel!

Scientists have come to believe that space is in fact like a fabric which can be warped or in simple words shaped, by matter and energy. We can consider this fabric of Space-time as a trampoline. It is completely undisturbed, but when we put an object on it, its shape changes and the object causes the fabric to curve downwards. This object is nothing but matter (energy in its simplest form) which causes the Spacetime fabric to deform. Coming to black holes, they are nothing but stars that imploded or were crushed under their own gravity. Due to the star's immense gravity, it created a kind of hole in the fabric of spacetime which is nothing but a Black hole. In fact, if we manage to go through the black hole without being hurt (practically not possible), then we will be transported to a completely different part of the universe and time stops (because not even light can escape a black hole).



Alongside, is a representation of a wormhole. It is pretty clear that the traversable wormhole is way faster than the normal route of light. In fact, black hole is also a wormhole, but it is a one way trip and once you go inside a black hole, you can't come back. Not something useful.

Theoretically, the laws of Physics don't prevent us from creating a two way wormhole which will be the easiest way to go anywhere in the universe! Here we come to a dead end. Because we would need staggeringly large amount of energy, merely to bend the spacetime fabric. We will need 'Exotic matter' simply to keep the mouth of the wormhole open. Exotic matter a.k.a. Negative matter behaves completely opposite to normal matter. For example, it is repelled by gravity instead of getting attracted and this property will help us prevent the wormhole from collapsing under its own gravity. But negative matter has not yet been proven to exist and even if it does, we will need negative matter the size of Jupiter, to be able to create a human traversable wormhole.

Even more interestingly, once we are able to create wormholes, we can go through them to another part of the universe presumably, at speeds equal to or faster than the speed of light. This means that time would almost stop for the person who went through the wormhole. So, when he will come back, he might find that centuries have passed on Earth and he might be younger than his own great grandchildren! Using the same principle, the time traveller might be able to go to the past when we were still speculating on the idea of a wormhole.

We might alternatively enter a parallel universe just like ours. So, either by creating a wormhole or reaching near to the speed of light, we can in fact time travel, provided we are able to create a warp bubble around us to protect us from the haywire distortions that will occur (such as gaining infinite mass).

Here we come to the end of our breathtaking journey. But in this short article, I just scratched the surface of the mind-blowing possibilities of Quantum Field Theory, Einstein's relativity and our modern theories of Physics and Astronomy. I hope you enjoyed reading this article and am looking forward to sharing more of such wonders.

Thank you.

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*Narendra Aironi*  
Founder of Ignite magazine

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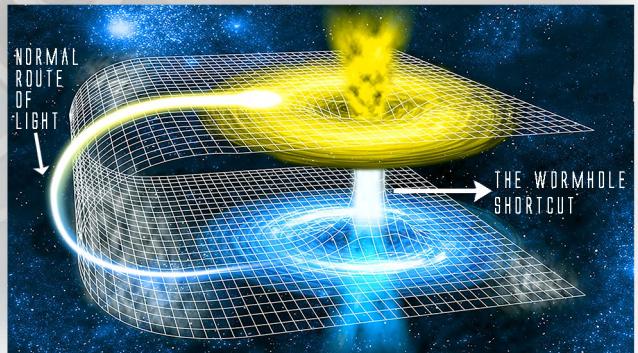


FIG. 1 PICTORIAL REPRESENTATION OF A WORMHOLE



FIG. 2 REAL IMAGE OF BLACK HOLE - HOT, GLOWING MATTER BEING INEXORABLY PULLED IN BY ITS POWERFUL GRAVITY.



FIG. 3 HOW IT WILL LOOK INSIDE A WORMHOLE





THANK YOU  
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