Is Dark Energy Actually Light?

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(Vancouver, B.C., November 30, 2020) A few weeks ago I published a paper discussing the potential to use one of our four recent patent applications to search for dark matter (1). While dark matter makes up 85% of all matter in the universe, both normal matter and dark matter together only make up a small portion of our universe. About 68%-70% of our universe is something called dark energy, normal matter accounts for close to 5% of the universe and dark matter is believed to be the remaining 24-27% (2). Dark energy, like dark matter is named "dark" not to signify that it's dark but that it is unknown. No one knows what dark energy is but we know from recent observations of the universe that about 5 billion years ago it began expanding and has been accelerating faster each day.

When Albert Einstein developed the general theory of relativity, the wide held belief at the time was that the universe was static, his initial calculation indicated that the universe should be expanding, so he added a "cosmological constant" to the equation to allow for the universe to remain static. Then in 1929 Edwin Hubble discovered that galaxies were moving away from us in all directions. Einstein's initial equation was correct and he admitted that his addition of the cosmological constant was the biggest mistake of his life. Had he left it out, he would be credited at the discovery of an expanding universe prior to Hubble. Einstein retracted the cosmological constant in 1932 (3). This created profound implications for Einstein which I will discuss later.

Recently, two different groups were analyzing a particular type of supernova explosions which create a specific brightness and this will indicate the distance from the observation point, which in this case is Earth. They both came to the same conclusion that the universe expansion is not slowing down as expected but is speeding up (4).

More recent observations now confirm that the change in expansion from slowing to speeding up began about 5 billion years ago. Dark matter was the dominant force in the universe with a strong gravitational attraction. Now dark energy with a repulsive force has become the dominant force and is growing stronger every day.

The farther away we see something in space, the farther back in time it was when that light we are seeing now was emitted. We are not seeing the light from the sun as it is, but as it was 8 minutes ago. This is how scientists can look at these particular supernova and determine that it is expanding faster, but also when that change occurred in the scale of billions of years.

Cosmologists have taken the equation of Einstein's general relativity and added another cosmological constant in another place to account for dark energy. They don't like this new cosmological constant and prefer a simpler equation.

The question "what is dark energy?" will elicit 70 different answers from a room full of 50 different scientists. We just don't know what it is or how it functions, but we can see the effects. So while we thought we had a good handle on how the universe works, we actually know less than 5% the universe's composition (5).

When the Hubble telescope was aimed at a very small portion of empty space, called the Hubble Deep Field and remained there for two weeks to allow any faint light to build up, similar to a long exposure photo, the image unexpectedly revealed a number of light sources that are not individual stars but galaxies (6). The follow on experiment called the Hubble Ultra Deep Field, used new advanced cameras that had been added by a space shuttle mission to look at the same area. Scientists have identified more than 5,500 galaxies in a central portion of the field and about 10,000 galaxies in the wider region (7).

From these findings and other observations, astrophysicists now estimate that our universe contains about 2 trillion galaxies, producing a trillion-trillion stars. They have also calculated the amount of visible light released into the universe by stars since the universe's origin: 4 x 10^84 photons. 4,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000 photons (8) (9) (10).

Another study found that star formation peaked 10 billion years ago, less than 4 billion years after the big bang. "We kind of missed the party and it's been declining ever since," says team member Kári Helgason at the University of Iceland (11).

Does light produce gravity? Einstein's theory calculated that a star slightly behind the sun should be observable during a solar eclipse as the gravity from the sun should bend the star's light into view. This was confirmed in 1919 and Einstein soon became a household name (12). According to equations, light should have gravity, otherwise the deflection would not occur. There is also a gravitational repulsive effect of light when it is absorbed (13).

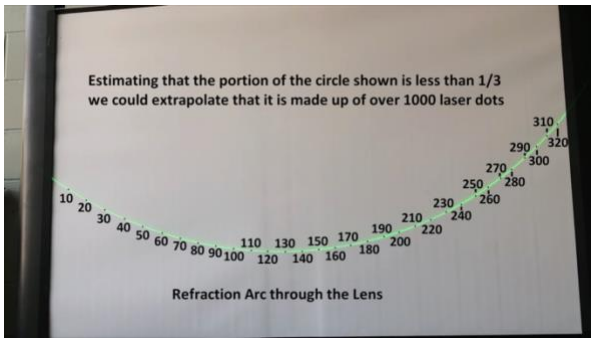
So we have a few items to review: Dark matter (gravity) was dominant in the universe until about 5 billion years ago when repulsion (dark energy) took over becoming more dominant ever since. The early universe lacked light, as dark matter coalesced, it attracted hydrogen which compressed under this gravity to form the first stars. New stars continued to form faster, often from the remnants of dead stars or supernovas producing heavier elements, until star formation peaked 10 billion years ago. Stars can emit light for many millions or billions of years depending on their size, color and temperature with larger stars burning faster and brighter. The most dominant stars in the universe are small red dwarf stars may burn for trillions of years, but are quite dim (14).

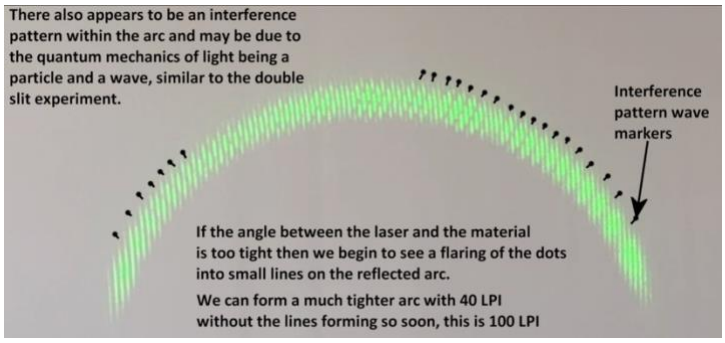
Two light pulses emitted in parallel in the same direction do not attract or repel each other but if light pulses are emitted at two different sides where they are opposed to each other they will gravitationally attract the other as they pass close by. I suggest watching the video the researchers provide at the beginning of the abstract between 3:10-3:23 here Gravitational properties of light—the gravitational field of a laser pulse.

If light has an attractive gravitational effect at its source of emission and a repulsive gravitational effect when absorbed, would those photons (massless particles of light) which peaked 10 billion years ago, buildup enough over the next 5 billion years of emitting into the universe to eventually be absorbed, causing enough of a repulsive gravitational effect overcome the combined gravity of matter and dark matter?

Can photons be absorbed by dark matter? Dark matter doesn't appear to be influenced directly by light, it does not absorb light, as far as we know. We know that gravity influences light as per Einstein's equations and numerous test results. In the paper I wrote a few weeks ago (1), I proposed using our company's patent pending laser splitter that can split a single laser into millions of smaller lasers that are clones of the parent laser and these may be able to detect weak interactions with theoretical axion particles of dark matter. New computer models suggest that axions modulate light polarization and most lasers are polarized.

Recently star light and galactic gases have been observed to have polarizations that far exceed current models (15).





When I conducted my initial experiments with a handheld laser and a lenticular lens where I could create a circle of about 1000 laser dots, when I tightened the circle to form I tight arc, I noticed an interference pattern which indicated quantum mechanics was occurring. Experts in optics have since verified my assumption as "100% accurate". This is an easy repeatable experiment. The images above are from the following video: (16)

Quantum field theory calculates a value for dark energy that is 10^{120} times larger than what is observed. That is an error of epic proportions, if that number was correct, space would be expanding so fast that galaxies and stars could not form (17). In other words, we don't know what it is, does it exist at all or are the equations missing something fundamental. So what are we missing?

The universe is made up of connected filaments which galaxies tend to cluster on, these filaments are thought to be made up of dark matter. In between the filaments are voids thought to have little matter or dark matter and it is theorized that this is where dark energy is strongest (18).

Another study found that the rotational axis of 19 different supermassive black holes at the center of quasars were all in alignment. This indicates that different galaxies seem to be aligned on the same filament structure (19).

Many scientists believe the voids between the filaments is where most of the dark energy resides and it is getting more powerful as the voids expand. How big are these voids? *Voids have typical sizes of hundreds of millions of light years and occupy about 90% of known space* (20).

We know that absorption of light will cause a repulsive force with lasers, we also know that lasers aimed at each other will have a gravitational effect on the other. In 2015 physicists made their first observation of the pushing pressure of light (21). This NASA site shows the calculations that demonstrate that sunlight exerts pressure (22).

What if the photons of light being emitted from the stars, galaxies, quasars, hydrogen… from one filament is spreading out across these voids at the speed of light and hundreds of millions of years later is either being repelled or interacting with matter, dark matter and/or light being emitted from another filament, thereby pushing the expansion of the universe faster as time goes on. What resides in the voids? Photons traveling at the speed of light away from their source. So ironically, dark energy may simply be photons of light which are filling the voids between the filaments like a firehose filling water balloons. This explanation may be oversimplified and has a few issues.

When a photon traveling through space experiences any photons going in the opposite direction or any direction that is not parallel to their own direction of travel, there should be a gravitational attraction between them that can cause the photon's path to deviate.

How can a photon have energy if it has no mass as $E = mc^2$? The issue is that Einstein's famous equation is a special form of his larger equation which $E^2 = p^2c^2 + m^2c^4$. *E is the total energy of the particle, p is the momentum of the particle (which is related to its motion), c is the speed of light, and m is the mass of the particle… Since photons (particles of light) have no mass, they must obey E = pc and therefore get all of their energy from their momentum* (23).

Massive photons happen when two photons link up and act as one large photon. These have been created in the lab with a significant effective mass which created a channel where the photons' paths were bent (24).

Another method is to create a polariton, a particle with both light and matter: To make light particles repel each other, scientist focused light onto a resonator that houses a semiconductor in the middle which is cooled to 269 degrees centigrade (Celsius). At this temperature photons can combine with the electronic excitations in the material, this combination results in polaritons. Polaritons are 50% light and 50% matter and have a very small mass and can travel very fast but unlike photons, polaritons can interact very strongly with each other and repel each other and repel other photons (25). After the polaritons get to the end of the material they convert back into photons (26). The temperature of space happens to be -270.45 Celsius (27).

Perhaps photons of light are not directly responsible for dark energy, however, they may be indirectly involved with the creation of enough polaritons to create that repulsive energy. Given the temperature of space happens to be at this ideal temperature for polariton creation. Is there a process with photons of light traveling through space at the speed of light eventually strike or are absorbed by matter and/or dark matter to convert the photons into the polaritons which imparts this repulsive quality that polaritons are known to have?

A paper published from earlier this month references "axion polaritons". Axions are theoretical particles that are thought to make up dark matter. The axion should be roughly a billion times smaller than an electron, hence the difficultly in detection. *The level repulsion induced by the strong coupling represents a common feature of polaritons. Axion quasiparticles, emerging in topological insulators, were predicted to strongly couple with the light to lead to the so-called axion polariton* (28).

Another article from May this year discusses using polaritons to detect axions: Detectability of Axion Dark Matter with Phonon Polaritons and Magnons (29).

In 2014 there is an article which discusses that *gamma rays produced by the self-annihilation of neutralinos in the interior of the Sun can be transformed into axions due to* ***photon-axion conversion****. Then, the axion will travel freely in the Sun and be converted into photons again. This process is often referred as 'shine light through walls', in this case, the wall will be the solar interior* (30).

A 2018 article: *In this Letter, we propose a novel scheme to observe signatures of ALPs* (Axionlike particles) *in plasma experiments. In the presence of strong magnetic fields, a new quasiparticle is predicted—the axion-plasmon polariton—originating from the hybridization between the axion and the plasma waves* (31).

These articles and experiments discuss the relationship between photons, axions and polaritons but the polaritons are artificially produced in a resonance chamber with a manufactured semiconductor, are there natural materials that can provide this function? *…However, observation of anisotropic polariton propagation in natural materials has so far remained elusive. Here we report anisotropic polariton propagation along the surface of α-MoO_3, a natural vdW* (van der Waals) *material* (32).

Light and matter merge in quantum coupling: *What we're doing is the extreme case of nonlinear optics, where the light and matter are coupled so strongly that we don't have light and matter anymore. We have something in between, called a polariton."… What is unique about solid-state cavity QED* (cavity quantum electrodynamics) *is that the light typically interacts with this huge number of electrons, which behave like a single gigantic atom."* (33)

Another quasiparticle can be formed by the interactions between photons and excitations in a material. The resulting polaritons are low-mass bosons that should be able to condense at higher temperatures—possibly including room temperature. One signature of a polariton BEC is the production of coherent light—effectively, the quasiparticles act like a laser. Several experiments have created polariton BECs, though still at relatively cold temperatures (34)*.*

Further to the last article: *Physicists have created what they say is the first device that's capable of generating particles that behave as if they have negative mass. The device generates a strange particle that's half-light/half-matter, and as if that isn't cool enough, it could also be the foundation for a new kind of laser that could operate on far less energy than current technologies. This builds on recent theoretical work on the behaviour of something called a polariton, which appears to behave as if it has negative mass – a mind-blowing property that sees objects move towards the force pushing it, instead of being pushed away. …They do this by manipulating captured photons and combine them with a kind of quasi-particle called an exciton to make something half-light/half-matter that some scientists affectionately refer to as 'magic dust'* (35)*.*

Directly or indirectly, light could be the engine that powers dark energy. It fits some of the fundamental aspects surrounding the mystery; An energy that was minimal or non-existent during the early dark age of the universe before stars could form (36). An energy that seemed to grow in strength as the universe aged, overtaking the gravitational attraction of the universe about 5 billion years ago with a repulsive force.

The speed of light is limited and if star formation peaked 10 billion years ago, the spread of photons building to that point would take hundreds of million years to cross a void before they were absorbed by dark matter or matter within a filament and their energy became repulsive or interacted with that matter to create quantum particles with a repulsive force or a negative mass. Only a small percentage of the photons would hit the closest filament and most would travel hundreds of millions or even billions of light years further before an interaction with matter occurred.

Star formation has not stopped, just slowed down and while we may have less photons being produced today, there are still photons moving through space at the speed of light that were produced near the beginning of the universe (after the dark age) that we detect on telescopes today as they are absorbed by the sensors. Photons will continue to move until they run into something and while the absorption may not seem like it could impart much of a repulsive force, photons are being produced every second from numerous sources including stars within more than 2 trillion galaxies.

Is light going in one direction interacting with light going in the opposite direction? Is light somehow converting to highly repulsive polaritons or other quantum like particles when it finally interacts with matter or dark matter through a means we don’t understand?

As black holes and galaxies are aligned on filaments, the filaments themselves may be polarized and repelling other filament strands that are parallel to them (two magnets of the same polarity repel each other when opposite of one another) and is this polarization growing stronger, speeding up the expansion of the universe? This may be a case of matter / dark matter providing the polarization which is the dark energy!

Einstein recognized that if his initial equation allowed for an expanding universe, it meant there was a beginning which also meant there was a beginner or creator, the addition of his cosmological constant removed the expanding universe and the need for a creator, as I said earlier, Edwin Hubble later confirmed the expanding universe. Einstein conceded angrily at first: *"The circumstances of an expanding universe irritates me... To admit such possibilities seems senseless."* but went on to acknowledge *"the necessity for a beginning" and "the presence of a superior reasoning power"*.

Though he confessed to the rabbis and priests who came to congratulate him on his discovery of God that he was convinced God brought the universe into existence and was intelligent and creative, he denied that God was personal… Einstein, like many other powerful intellects through the centuries, ruled out the existence of a personal God. Nevertheless, and to his credit, Einstein held unswervingly, against enormous peer pressure, to a belief in a Creator (37).

Physics 101: Describe the universe using three key words in a sentence and use them in the correct order?
In the beginning (**time**) God created the heavens (**space**) and the earth (**matter**). Genesis 1:1, NIV.
Yes, time, space and matter is correct. Can you elaborate with more detail?

Now the earth (**matter**) was formless and empty, darkness was over the surface of the deep (**dark age of the universe**), and the Spirit of God was hovering over the waters. Genesis 1:2 NIV.
Could the waters represent dark matter which would eventually clump to form gravity wells to collect enough regular matter or could the waters represent a different fluid? Scientist recreated a quark-gluon plasma that is thought to have filled our Universe in the first microseconds of its existence but it turned out to be a fluid. *"It's as much a fluid as the water in this glass,"… The resulting liquid is almost 'perfect': it has a very low viscosity and is so uniform that it looks the same from any angle.*

This may help to explain why the deepest parts of the Universe seem similar wherever astronomers look, says Kharzeev. If the primordial liquid had been as viscous as honey, the Universe could have turned out much more lumpy, he explains. "We can be certain this will change our picture of the early Universe," he says (38).

And God said, “Let there be light,” and there was light. Genesis 1:3 NIV Bible Gateway.
Light occurred only when enough hydrogen came together to form the first stars (39).

Stephen Hawking quotes from his book "A Brief History Of Time, A reader's companion": *"Einstein once asked the question: How much choice did God have in constructing the Universe? If the no boundary proposal is correct, he had no freedom at all to choose initial conditions. He would only had the freedom to choose the laws the universe obeyed. This, however, may not have been all that much of a choice. There may well be only one unified theory that allows for the existence of structures as complicated as human beings who can investigate the laws of the universe and ask about the nature of God."* (40)

In 1997 I wrote a paper that I sent to Professor Stephen Hawking (41). His assistant responded back to me that he had read the paper and would respond ASAP, he never did and I have had other physicists tell me that my paper put Stephen into a corner he could not get out of. I challenged the “Irreversibility in the Direction of Time” with mathematical evidence regarding three apparent time reversals, two that had concluded within the past 50 years of my paper. To deny the evidence would mean that time travel is possible, to accept the evidence would confirm the God of the Bible is not only the creator of the universe but is also active and personal.
See: Stephen Hawking's Universe Implodes.

Near the end of his life, Professor Hawking claimed there was no God, no heaven and no afterlife (42). Either the universe is a finely tuned creation as Einstein believed or a random universe that came from nothing that would have to fit the laws of physics we observe as Hawking believed.

Is the universe just a random occurrence that meets impossible criteria, thus invoking an infinite amount of universes within a multiverse? Sir Roger Penrose, an emeritus professor at the Mathematical Institute, University of Oxford, a 2020 Nobel Laureate in Physics (43), and colleague of Stephen Hawking, together they won the 1988 Wolf Prize in Physics for the Penrose–Hawking singularity theorems (44), dismisses that idea outright due to the extraordinarily precise and ridiculous number as the initial state of the universe as it relates to the second law of thermodynamics (45). The beginning of the universe is not just 'highly ordered'. It is a state of perfect order (46). Watch this video interview from last year as Penrose discusses the precision of the universe: Roger Penrose - Is the Universe Fine-Tuned for Life and Mind?

Could we be in a universe that repeats indefinitely with so many iterations that we happen to be in the one that worked? A universe that is speeding up in its expansion due to dark energy is unlikely to reverse and implode to potentially begin again. The implications of a one-time universe which began with "perfect order" are profound!

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About the author:

Guy Cramer is the grandson and former research assistant to Donald Lewes Hings, P.Eng, M.B.E., C.M., the inventor of the Walkie-Talkie just prior to World War II and inventor of 55 other patents. Hings received the Member of British Empire award shortly after WWII and the Order of Canada in 2001 which is the highest civilian award granted in Canada. http://www.hyperstealth.com/DonHings/

Guy is also the President/CEO of Hyperstealth Biotechnology Corp. which is a private Canadian company that has developed numerous camouflage patterns for militaries around the world with over 6 million military issued uniforms that use Hyperstealth patterns. Hyperstealth also create patterns for several hunting companies such as Sitka, W.L. Gore & Associates, Harkila, Beretta and Columbia Sportswear.

Guy recently invented four different patents for Hyperstealth including Quantum Stealth, an invisibility cloak which has been featured on New Scientist, DailyMail UK, Telegraph UK, BBC, CTV's Your Morning, CTV News, Global News, Dezeen, CBS Radio, Now This News, Express UK, The Sun UK, The New York Post, The World News, WIRED, LADbible, MSN, Reuters, engineering.com, CNET… In January 2020, Guy was asked to be a Keynote speaker at "Les Napoleons" in Val d'Isère, France. A French bi-annual conference series and global community of top-ranking experts. The focus was on the ethical issues around a technology like his invisibility cloak: This closed interview was a separate part of that event https://vimeo.com/389010511.

All four patent applications were published last year and Hyperstealth provided over 100 minutes of videos demonstrations and explanations for Hyperstealth in 2019. These can be seen on each of these Hyperstealth sites: New sites https://www.hyperstealth.net and https://invisibility.ca. Our old website https://www.hyperstealth.com/ The format on our old site cannot be modernized without removing images and pages that are required to establish original copyright publication dates for our numerous camouflage patterns.