External-Inertia Propulsion By Photons of the Second Kind !!!

Wm. Scott Smith ☼ scott712@hotmail.com) ☼ USA+509 315 9602 (GMT - hrs)

Not only is the Universe both *stranger* and more wonderful than we imagine; it is probably *more-wonderful* and more mysterious than we ever *can* imagine!

In practice, Casimir's Two-Plate Experiment only permits *one* of the Two "Plates" to move; therefore, thanks to Casimir, Lamoureaux and many others, we truly ***know*** that we can alter the radiation-pressure of the Quantum Flux on one side of one plate without altering the radiation pressure on its opposite side.

We do not have to add any momentum or energy to the system to alter the Photon-Birthrate of the Quantum-Flux on one side of the plate or to stimulate emission of the Photons that move the plates.

Therefore, since these photons form outside the system they can continuously impart ***net*** momentum and Kinetic Energy to this asymmetric system. Just as the Sun produces a stream of photons that we can use for power, so *also* does the Zero-Point Energy Field. Both are free for the taking.

Two Photon Species	I	II
Energy must be added to to cause photon emissions.	Y	N
Zero-point *Kinetic*-Energy is Imparted to only one atom, in a single direction only.	N	Y
Appears without making an atom recoil.	N	Y
It disappears before it can impart an equal and opposite reaction into an otherwise isolated system.	N	Y

Just because the Photon has less than its starting energy as it leaves the plate, doesn't prove that net energy is being added to the Universe. The Quantum Flux probably *already* took back just as much energy as it gave, perhaps by removing a different photon. As for Entropy, Illya Prigogine received the 1977 Nobel Prize for Chemistry for proving the existence of self-organizing random systems. Basically, systems can organize themselves, but only if there is a sufficient expenditure of external energy and an ***over-all*** increase in entropy to make up for the local decrease in entropy. Just as a growing seed is powered by the photons of the Sun so also is Casimir's One-Moving Plate powered by a continuous shower of photons from the Quantum-Flux.

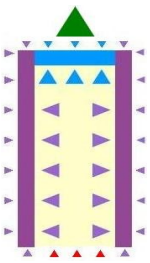
Quantum-Flux Radiation-Pressure **would *continually*** move Casimir's One-Moving-Plate if only the other plate was not blocking it (or else, *why would it move the plate* ***at all?)*** We wouldn't build a car that runs into *itself,* ***neither*** should we do so with our plates! Just as Casimir's One-Moving Plate is sheltered from the Ambient Quantum Flux by a second plate that is stationary, so will we *also* build a sheltered plate, but *our* Plate *self*--shelters a portion of its *own* surface. Sheltering does not cause an equal and opposite reaction since ***we*** do not have to add any momentum or energy to the system to alter the Photon-Birthrate of the Quantum-Flux on one side of the plate or to stimulate emission of the Photons that move the plate. One side will be covered with nanoscopic holes. Diffraction Gratings reveal that Photons have wave-*width* and well as wave-*length;* therefore, the sides of the holes still shelter the ceilings of the holes.

As with Casimir's One-Moving Plate, the Quantum-Flux exerts a net force on one side of this Self-Sheltering Plate, but this time, there is no Second Plate to stop it. This is External-Inertia Propulsion in the sense that, like a sailboat, it does* not *expel its own reaction mass; instead, the* external environment *imparts momentum to it.

In contrast to Casimir's Plate, our plate will be designed and built to enhance the Quantum-Flux inside the cavities instead of depleting the Quantum-Flux inside them. (This is the so-called *"Repulsive" Casimir Force.'*) Below, we will examine the forces acting on a typical cavity:

Larger arrows represent the *larger* energy density of the Quantum-Flux inside the cavity. **Smaller** arrows represent the **smaller** *energy-density* of the un-amplified Ambient Quantum-Flux outside the Cavity. The sides are analogous to Casimir's Two Plates except neither moves and they now *continuously* shelter the ***third side (Blue); The third side experiences a net force since it is exposed to the stronger amplified Quantum-Flux on its interior side and exposed to the weaker ambient Quantum-Flux on its opposite side.***

All of the Purple Arrows represent the strength of the forces that are acting on the Cavity Walls. All of *these* pairs of forces that are acting on the Walls cancel.



Tiny blue arrows ▾▾▾ represent the force of the un-amplified photons of the ambient Quantum-Flux; they act on the Roof of the Cavity. The large Blue Arrows ▲▲▲ represent the force of the amplified Quantum Flux that are acting on the Ceiling of the Cavity.

The red arrows ▲▲▲ represent the photons of the ambient Quantum Flux that, despite being weaker, are *physically* large-enough bridge across the opening of the cavity. The large green arrow ▲ represents the small red arrows ▲▲▲ & large blue arrows ▲▲▲ added together. The large green arrow ▲ represents the net force that is acting on the entire Cavity!

The Sides of each Cavity are just like Casimir's plates *except* they are **not** *allowed* to move. The two sides of the cavity shelter all photons inside the cavity, regardless of which direction they are traveling in! This is because the wave-length characteristic can just as aptly be called wave-width, as evidenced by diffraction gratings; therefore, the distance between the sides and the cavity-length govern the cavity's effects on the photons that strike the ceiling of the cavity just as well as they affect the photons that strike the interior walls of the cavity.

The third side prevents the first two plates from moving apart so we don't have to force them together again! We now have a permanent Flux-Enhancement Zone in the cavity between all three sides of the Three-Plates. ***This is not like producing an increased air-pressure between two plates and waiting for the air to rush out!!!*** The specific properties of the Cavity will cause the Radiation-Pressure inside the cavity to continuously maintain an equilibrium-pressure that is greater than that of the Ambient-Flux, outside of the Cavity.

We know the proposed system violates no Natural Laws because we are simply causing a *system* of atoms and Photons to behave in the same manner as its individual constituent Atoms and Photons already behave, naturally: Photons of the second kind already impart net kinetic-energy to matter all of the time, nudging it back and forth with each Photon-Collision all around us all of the time. No energy or momentum is required to enhance or deplete the photon Flux on one side of the plate. We do not have to add energy to the system to cause the working-photons to be emitted by Space.

This device does not claim to turn a little energy into more energy. It does not claim unusual efficiency. It merely uses a freely-*available* environmental energy. Just as water molecules impart net *momentum to* a hydroelectric turbine, the Photons of the Quantum Flux impart net momentum to the One Plate System, for all of the same reasons. We use the photons that come from the sun, why can we not also use the photons of the Quantum-Flux? Really, *all* energy is *free* until someone seizes control over it and starts charging. For example, Solar Energy is free energy in exactly the same way.

The Quantum-Flux is Not Heat

The Quantum-Flux is actually *defined as the energy that remains in Space at Absolute-Zero degrees.* This is far more than a *mere* semantic issue. Heat-Radiation is composed of photons that cause

matter to recoil when they are first emitted. Photons of the Quantum-Flux do not impart momentum to matter as they are first forming. This distinction is quite profound: One cannot make heat stop existing or stop forming or to build up in a closed system without performing work on the system, but the Photons of the Quantum flux can do *all of these things for us.*

The so-called "Repulsive" Casimir Effect, where the flux-density is enhanced inside the cavity, is not as well understood as the so-called "Attractive" Effect, wherein the flux inside the cavity is depleted. Consequently, it is difficult to predict its *strength. In practice its measurement has proved very elusive. Indeed, the proposed experiments are probably the best way to measure it since we will be directly detecting the relative pressure inside the cavities. Encouragingly, the literature is generally optimistic that it will be at least as strong as the "so-called "Attractive" Effect wherein the flux inside the cavity is depleted. In any case, it will almost certainly be strong enough for use in MEM's and NEM's.*

Developing A Three Stage Plan

Initially, experts must be informally consulted to quickly sketch out how this research might be carried out. Many will only offer a few comments off the tops of their heads. ***Next,*** we must recruit some participants to write up preliminary plans, time-lines and budgets for each aspect to support a funding request. ***Finally,*** having a well-developed preliminary plan will help in recruiting participants to perform the actual research. These participants are not *necessarily* the same people that drew up the preliminary plan but are likely to be persons that have been identified and solicited by the planners and those who have expressed a favorable opinion of the project.

Overlapping Areas of Expertise:

Since some individuals can work on more than one aspect of the project, Separate areas of expertise will be delineated that may be covered by any combination of experts. Levels of participation will range from a few hours of consultation to participation in more extensive experimental iterations where materials and structures are conceptually conceived, modeled, designed, made, imaged, the approach is modified, remodeled and so on.

At least one, half-time expert from any *one* of these fields: **Cavity QED, Nanophotonics, Optoelectronics** can shoulder most of the burden of producing a detailed theoretical model that can be used to select materials and to design various experiments. We must develop a broad theory of how the so-called "Repulsive" Casimir Effect really works and how it might be enhanced by resonance, optically-pumping materials and cavity dimensions and shape. This theoretical framework will guide our initial modeling techniques to guide choices of materials and construction techniques.

Even resonance effects are not straightforward. Making the cavities as small as possible would be desirable from the standpoint of enhancing a denser, smaller wavelength---a more energetic part of the Quantum Flux; however, just because a cavity is a certain size, does not mean that it will really resonate in a manner characteristic of that size. This is because different wavelengths will penetrate the surfaces of of the cavities to different depths, thus increasing the effective cavity size differently for different wavelengths. This effect can be used to our advantage if we design cavities that are simultaneously optimized for a broad, continuous spectrum of wavelengths.

We need at least one expert in Computer Modeling to help further-refine our preliminary designs. We need at least one expert in Optoelectronics to aid in selecting and designing suitable materials. We need at least one expert in designing and producing nano-structured materials, possibly a semiconductor engineer. Finally, we will need equipment and personnel to image our surface, once it has been prepared, so we can adjust our methods to refine ever-better approaches to fabrication. This also enables us to correlate the actual structure of our surfaces to fabrication methods. We can then correlate the measured experimental results with the theoretical projections of the model. An expert on Special and General Relativity will be consulted on the Lorentz Invariant Cavity Theory as described in the next section of this paper, but only if that experiment confirms the theory first.

Lorentz-Invariant Cavities

The search for experimental proof of a so-called Repulsive Casimir Effect has met enough difficulty to suggest that we may really be missing a fundamental piece of the puzzle. There is one fascinating alternative theory on why Casimir Cavities work the way they do---at least concerning how the "Repulsive" Effect may work. There is a very small possibility that Relativistic Effects take place inside some cavities. If this actually turns out to be true, it would provide vital insight to any meaningful attempt to model the Repulsive Casimir Effect—indeed none of our models would then work right if this were wrongly unaccounted-for. Furthermore, this might have serious implications for economically reducing the half-life of nuclear materials for nuclear waste reduction. Besides, as unlikely as this truly strange hypothesis really is, it is far too simple and too inexpensive to prove or disprove to neglect performing the experiment.

This thinking evolves from applying Lorentz-Invariance to the interiors of the Cavities. According to this concept, none of the wavelengths inside the cavity are not actually smaller; instead, to still fit inside the cavity, some of their wavelength is expressed along their local time-axis so that they are blue-shifted to appear like shorter wavelengths to us. This also allows them to fit into the confines of the cavity since, in their temporal reference frame, the Cavity actually looks larger to them. This is the inverse case of the Relativistic Astronautical Twins. Events inside the cavity appear accelerated to us, much as Space-Twin sees his brother moving and aging faster, back on Earth.

One possible evidence of this effect is the Chemically Catalytic Action of Raney Nickel which is a highly nano-porous mixture of Nickel and Aluminum. It is generally assumed that its catalytic action is due solely to its vast Surface area; however, its catalytic action performs far better than the theoretical surface-area models allow for. The Relativistic model is an attractive alternative to surface-area-only models. Accordingly, a given chemical reaction may *still* require as much time as the Surface-Models indicate, but from *our* standpoint, this time passes more quickly for molecules inside the cavities.

It is proposed that a sample of Raney Nickel be exposed to a carefully measured amount of radioactive Kr 81 gas. It is commercially available, safely diluted by other gases. Its radioactive decay rate will be compared with a quantitatively identical reference sample that is not exposed to the Raney Nickel. If the Sample with the Raney Nickel decays significantly faster, this will confirm this truly bizarre hypothesis.

Actually, this is not *quite* as far-fetched as it truly seems. We can derive Casimir's formula k / d^4 by first imposing Lorentz Invariance on the frequency distribution of the Electromagnetic Quantum-Flux. (In other words, all inertial frames will see the same frequency distribution of the Electromagnetic Quantum Flux.) This gives us the density D of a given frequency f as equal to the frequency f to the third power. D(f) = k*f^3.

Integrating this gives us k * f^4 which is the total density of all frequencies that are greater than or equal to f. Converting frequencies to wavelengths, this becomes the Casimir two-plate formula which gives us the total pressure P of all wavelengths that are greater than or equal to d. P = k / d^4

The moral of the story is this: The whole business *began* by first assuming Lorentz invariance. We should not then be terribly surprised if this principle is important to *further* understanding the inner workings of these cavities.

While we are on the topic, it is worth noting that k / d^4 extrapolates to infinite energy at every point in the Universe, a dubious result which threatens to bring the whole analysis into question. Worse yet, most schemes for imposing a reasonable limit on this trend suffer from a severe case of Ad-Hoc Presumption Syndrome. Fortunately, Relativity once more comes to the rescue. Relativity imposes a *natural* limit on the maximum mass-energy density that can be sustained by Space. As the electromagnetic wavelengths of the Quantum Flux approach the Planck-Length, *Relativity* requires the resulting mass-energy density of k / d^4 to cause Space to curve in on itself, producing Planck-length Black holes and (according to Einstein himself) White Holes ---which John Wheeler combined

to form miniature Wormholes. This is an especially attractive theory since it provides a physical mechanism to explain the actual nature of the Planck Length. Plus, it ties QED to Relativity in a very natural way. It also leads to a plausible model of the Quasi-local Characteristics of Space-time.

Van der Waals Forces of Distraction!

Casimir himself originally proposed that his experiment would prove that the Radiation Pressure of the Photons of the Quantum Flux moves real *physical* objects. *He* cited Van der Waals Forces as an example of this Quantum-Flux Radiation-Pressure Phenomenon; yet, despite the entire premise of Casimir's original concept, and despite the fact that the Casimir formula can be derived from the Quantum-Flux Models and calculations of QED and Stochastic Dynamics and despite the fact that all of this has been experimentally confirmed to be highly accurate---despite ***all*** of this, skeptics pervert Casimir's own example; they dismiss the Casimir Phenomenon as possibly nothing more than Van der Waals forces of Distraction. This truly stunning juxtaposition is akin to absurd suggestion that the Path of the Earth Around the Sun *might* cause both gravity and inertia!!!

Radiation-Pressure Interpretation Versus the Attraction-Repulsion Model

Strangely, even researchers who subscribe to the Radiation-Pressure External-Forces Interpretation lapse into inappropriate analyses that are rooted in the Internal-Forces Attraction-Paradigm; therefore, even if ***everybody*** agreed with the Radiation-Pressure Interpretation, we would *still* need to revise our analyses and perform the present, more-definitive experiment.

If *internal* forces cause Casimir's plates to literally attract each-other, it is just as impossible to obtain energy from them as it is to *continuously* obtain energy from two magnets. The ***mechanical*** reason is that it takes just as much energy to separate them as is gained when they come together. The ***general*** reason is that all forces are internal to the system and no *self-contained* system can *continuously* move *itself* without violating the Laws of motion and the Four Great Laws. With ***magnets***, there is no way around this dilemma since the source of the attraction resides entirely *inside* the two-magnet system itself; but if Casimir's plates are **not** actually attracting or repelling each-other, but are instead moved by the externally-generated Photons of the Quantum Flux then different rules apply!!! We no longer need to provide secondary objects for the first object to be "attracted" to or repelled from!

Furthermore, violating the Laws of Magnets in this manner also leads to an intolerable attempt to violate the Laws of Thermodynamics since a system with finite energy cannot continuously export energy beyond the system boundaries because the energy would run out, there wouldn't *be* any additional, *available* energy to extract; but the One-Plate System doesn't run out of energy because it is constantly resupplied by the energy of the Flux-shine just as the Great Light gives us Sunshine.

Since the Photons of the Radiation Pressure of the Quantum-Flux push the plates, then the outlook is dramatically better for utilizing this phenomenon since these photons are on independent inertial trajectories that originate outside of the One-Moving-Plate System, I use the term inertial-trajectories *loosely* since photons are defined to not have mass; even so, they have momentum. In other words, when they impact an object they impart a their momentum once when they hit and a second time, in the same direction if they *reflect* or perhaps in an arbitrary direction if they are absorbed and *re-emitted, which still leaves us with a net impartation of Kinetic-Energy.*

These skeptics quite rightly point out that no object can move unless it is *pulled*-on or *pushed*-on by an *independent* force---nor can **we** create new energy; but these skeptics are forgetting that Space itself is *continually* doing *both* of these things! (If you object to what *nature* is doing, I will be happy to forward your complaint to the Chief Engineer in charge of all these matters!) I have merely stated the bare, undeniable facts of how the Quantum Flux has been *experimentally* determined to work by the *many* variations of Casimir's Experiment. No matter how *traumatically* this may shatter our most cherished notions about the *supposed hopelessness of it all,* we must none-theless require our *experiments* to inform our *beliefs and not the reverse.* *Wm. Scott Smith scott712@hotmail.com*