https://e-catworld.com/2025/06/09/swedish-company-on-zero-point-energy-and-the-e-cat-sagacitas-ab/#google_vignette

Swedish Company on Zero Point Energy and the E-Cat (Sagacitas AB)

- June 9, 2025
- 40 Comments

Here's a link that was sent to me by a reader today. It is for a website of a Swedish company named Sagacitas AB which describes itself as a developer and consultant for renewable energy. Now they are focusing on Zero Point Energy and say they are in an exploration phase, an have no commercial activity.

https://sagacitas.se/Home/

Much of the website focuses on Andrea Rossi's work with the E-Cat NGU, and reviews Rossi's 7 point theoretical hypothesis. The website emphasizes that this review is only speculative.

The content reminds me of a post that was made on this site in April of this year by Calle H titled "Engineering at the Quantum Scale with the E-Cat", so maybe there is some connection with this company.

https://e-catworld.com/2025/04/03/engineering-at-the-quantum-scale-with-the-e-cat-calle-h/

https://sagacitas.se/About-us/

SAGITAS

Sharp technologies for a sustainable future

About us

For more than 20 years we have worked as developers and consultants for renewable energy mainly within forest and bio energy. We have now switched focus to the new and exiting Zero Point Energy. Currently we are in the phase of exploration and have no commercial activity. Sagacitas AB is a privately owned limited stock company founded in 2002.

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Time to phase out the old renewables for new renewables?

When fossil fuels started phasing out, solar, wind, water and bio was the natural choice for replacement. Good choice but a drawback with these renewables is that they are based on the rays from the sun.

With that follows low energy density resulting in many square meters of solar collectors, very large diameter wind turbines, large dams for rain water collection and forest areas that compete with other stake holders.

Other draw-backs are intermittent availability (day / night for the solar cells), periodic availability (good wind / no wind for the wind turbines), un-predictable availability (storm / flooding / draught, etc.).

Four candidates for the new renewables (created by AI):

	LENR	ZPE	Ultra-Dense H	Cavitation Bubbles
Energy Source Type	Nuclear (low-temperature fusion)	Quantum vacuum	Novel hydrogen phase (possible fusion)	Mechanical collapse (possible fusion)
Buzz word	Cold fusion	E-Cat *	Hydrino, UDH or H(0) Suncell **	HHO gas
Development Basis	Electrochemical/ solid-state	Vacuum tube (plasma)	Laser-induced or catalytic	Ultrasonic-induced in liquids
Mechanism	Often involves hydrogen or deuterium loaded into metal lattices (e.g., palladium), possibly producing excess heat.	Hypothetical methods to harness this ubiquitous background energy (such as through Casimir effect manipulation).	Hydrogen atoms form ultra-compact clusters under certain conditions, potentially allowing fusion reactions at lower energies.	Ultrasonic waves create vacuum bubbles that implode, concentrating energy (similar to micro-hotspots).
Main Claim	Excess heat with no typical radiation	Extraction of zero-point energy	Spontaneous fusion or particle emission	Fusion from bubble collapse
Scientific Status	Controversial but active	Proof of concept, partly speculative	Emerging, under exploration	Disputed, low replication
Potential Output	Clean nuclear-scale heat	Unlimited vacuum energy	Extremely high energy density	Small-scale fusion energy
Realization status	Actors claim close to commersialization	Demonstration (EV), production planning	Proof of concept demonstration	Actors with technology variants
Key Challenge	Reproducibility, endurance, theoretical	Feasibility, theoretical consistency	Detection, independent	Replication, measurement noise

*) Brand of Leonardo Corporation Energy Catalyser
**) Brand of Brilliant Light Power, Inc.

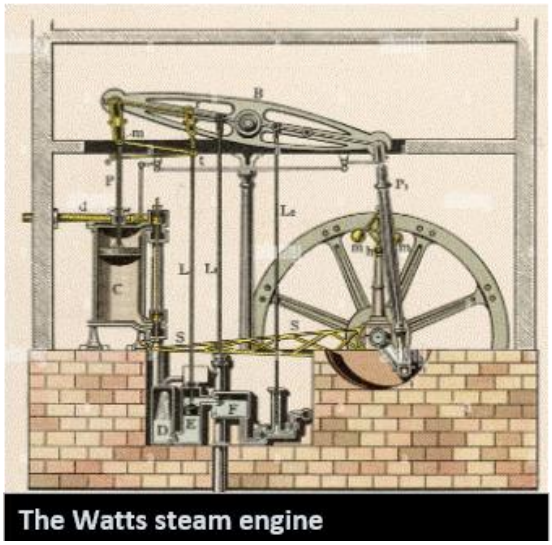
Engineering at the Quantum Scale

Zero Point Energy is harvested from the quantum field which is the very smallest things that we are aware of. How can you engineer anything at quantum scale 10^{-16} meters?

The industrial evolution started by engineering the steam engine at the scale of 1 meter. With the atomic bomb evolution had progressed far that things could be engineered at the scale of the size of the atom, 10^{-10} meters.

The difference between the atom world and the quantum world is then 10^{6} or one million times. That is a gigantic step for engineers to take.

May the Nobel Prize be waiting for ones who succeed.

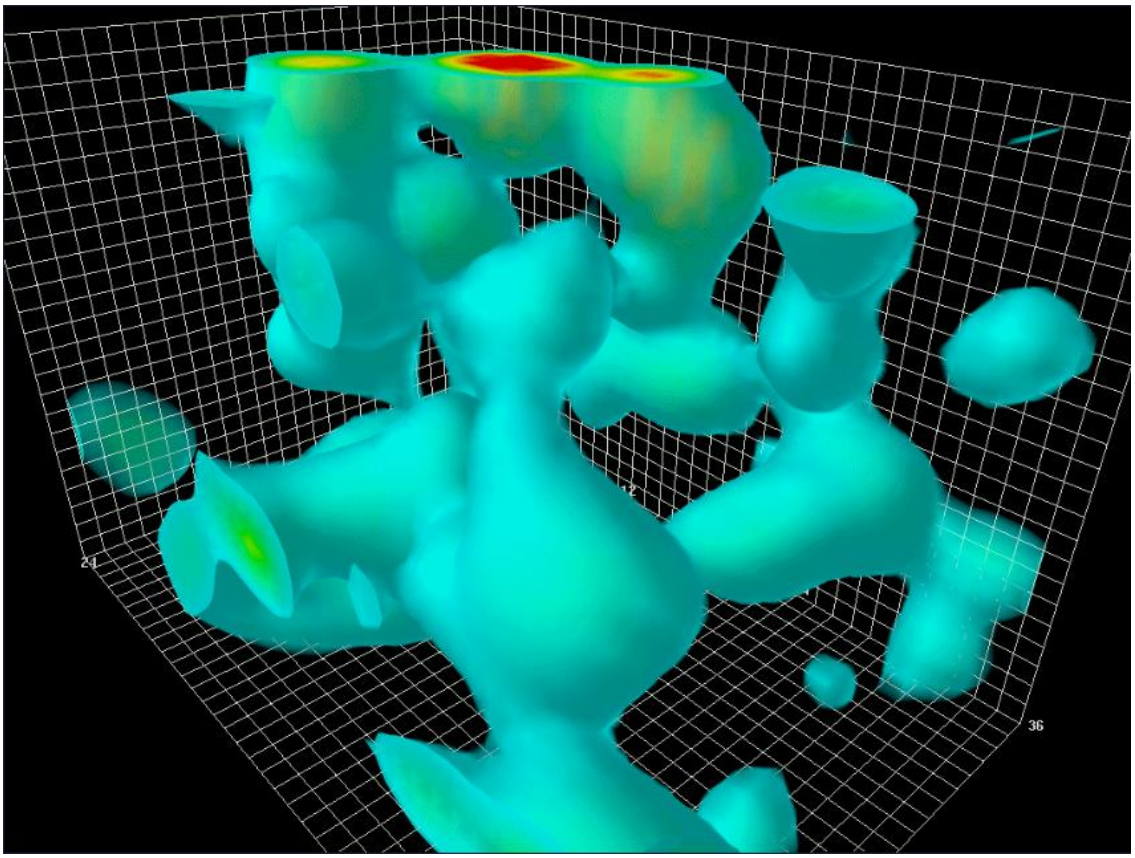


The Watts steam engine

Particle trace in a bubble chamber

Virtual Particles

In the quantum field virtual particles are formed and anhiliated at the speed of light. Quantum fields underlie all particles in quantum field theory (QFT), which is the framework combining quantum mechanics and special relativity. In this framework, virtual particles are a mathematical tool used in perturbation theory to describe interactions between real particles. These virtual particles are not directly observable and don't satisfy the usual energy / momentum relation. In calculations, they appear as intermediate states in particle interactions - like a photon "exchanged" between two electrons in electromagnetic repulsion.



Zitterbewegung

The electron zitterbewegung (ZBW) is a rapid oscillatory motion of elementary particles that obey relativistic wave equations. There are several interpretations of ZBW.

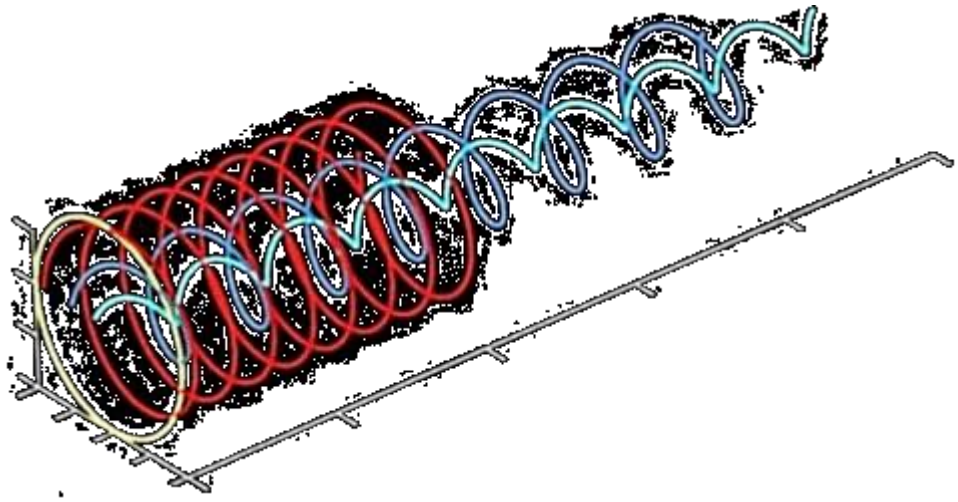
The mysterious Zitterbewegung motion, long since associated with the electron structure, seems to be responsible for the electron spin. The idea that the electron spin and magnetic moment are generated by a localized circulatory motion of the electron has been proposed independently by many physicists.

In quantum electrodynamics (QED) the negative-energy states are replaced by positron states, and the zitterbewegung is understood as the result of interaction of the electron with spontaneously forming and annihilating electron-positron pairs.

According to the standard model, the electron is a point particle, endowed with charge, mass, spin, magnetic moment, and quantum waves. Bohr himself pointed out the shortcomings of his electron model. For example, the electron cannot have an extended charge or it would explode due to electrostatic repulsion. Also, the electron should radiate energy when orbiting the proton core under Bremsstrahlung and thus should not be stable.

Feynman would later encapsulate this jittery electron movement by postulating an interaction between the electron particle and a sea of virtual particles and photons, what we know as quantum electrodynamics (QED). To some extent, all Zitterbewegung electron models consider the existence of a (point) particle which is moving in specific ways. Some posit toroidal movements and others circular movements, but it is a movement of the electron that is postulated.

Below: Spirals showing the effect of ZBW on electron velocity (v) vs. speed of light (c) where v/c = 0 (yellow) , 0.43 (red), 0.86 (blue), 0.98 (green).



E-Cat

Leonardo Corporation head of operations Dr. Andrea Rossi is the inventor of the E-Cat NGU. The NGU is comprised of a core assembly inside a flat cylinder 6 cm in diameter and height 3 cm. The core delivers 12V 10W electric output with only input from a small battery for starting the operation. Once started the E-Cat is self sustained. Multiple cores are then arranged into modules of higher voltage and power output. Information on E-Cat is available here https://ecatthenewfire.com/

E-Cat NGU

Is the E-Cat real?

A demonstration of the E-Cat was held at the Latina racetrack in Italy on October 27, 2024. One Renault Twizy car was powered without an E-Cat and another Twizy with an E-Cat. The Twizy without E-Cat stopped when the battery was deple-ted. The Twizy with E-Cat continued until the race was called off many hours later.

Latina race track

Dr. Andrea Rossi has given a guide for a 7-point theoretical hypothesis. Note that this is only a hypothesis. What we know is that the extraction of energy occurs within the quantum field but the science is not consistent on how this is done, hence the review of the 7 steps will be speculative.

7 step theoretical hypothesis

1- ZPE
2- dV/dt with high dV-> increase of ZBW and Aharonov-Bohm effect
3- electrons phase change
4- formation of electrons clusters in phase
5- decrease in entropy, < thermal capacity, < freedom degrees
6- transfer of energy to electrons not in phase
7- emission of energy

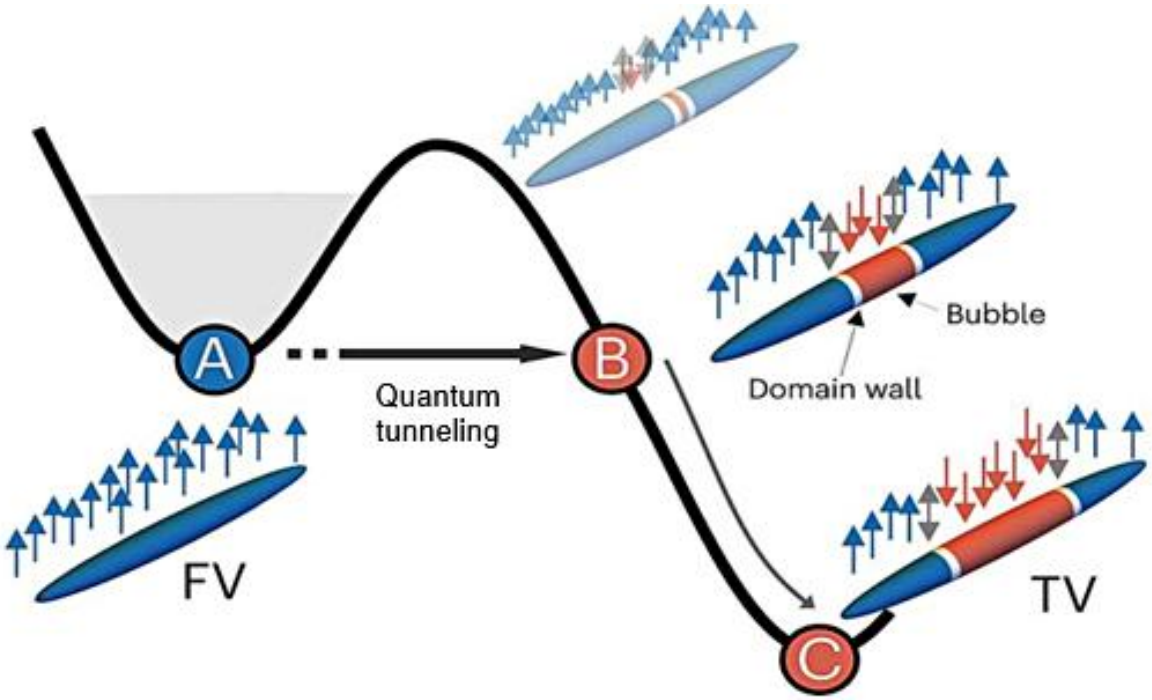
Step 1. ZPE

Pioneering research in quantum field theory around 50 years ago proposed that the universe may be trapped in a false vacuum (FV) meaning it appears stable (A) but in fact could be on the verge of transitioning (B) to an even more stable (C), true vacuum state (TV). The transition from the false to the true vacuum can occur via quantum tunneling, a process allowed by quantum mechanics where a system can "tunnel" through an energy barrier instead of going over it.

A small region of space undergoes a quantum fluctuation. These quantum fluctuations create what physicists call a "sea of virtual particles" that continuously appear and disappear in the vacuum and may spontaneously tunnel into the true vacuum state. The tunneling creates a bubble of true vacuum in the surrounding false vacuum. If the bubble is larger than a critical radius, the energy gained from converting false vacuum to true vacuum outweighs the

energy cost of the bubble's surface tension. The bubble then grows at nearly the speed of light, converting all the surrounding false vacuum into true vacuum as it expands.

Dr Rossi has come up with a way to produce bubbles of true vacuum which he can control so that energy can be excerted from the vacuum. It is these bubbles of true vacuum that we call Exotic Vacuum Objects (EVO).

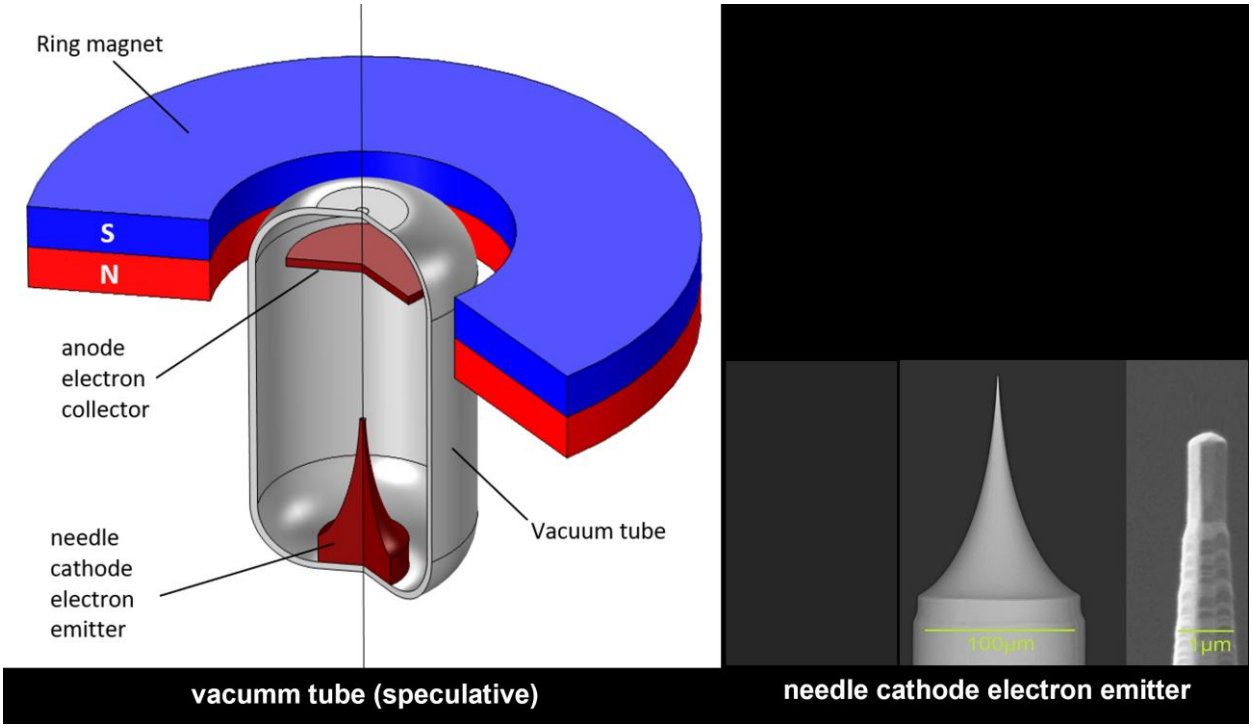


Step2. dV/dt

The vacuum tube is the heart of the E-Cat. It can be seen as an entropic pump, wherein point zero energy (foreseen by the uncertainty principle of Heisenberg) subject to dV/dt with high dV, causes increase of the Zitterbewegung of electrons and the Aharonov-Bohm effect, that causes electrons phase change, that causes formation of clusters of electrons in phase, that causes minor entropy, thermal capacity and freedom degrees, that result in transfer of energy to electrons not in phase, causing a gain of energy.

A high voltage generator powers an electron gun. Electron bursts by high frequency switching are short and sharp (high dV/dt). A cluster of coherent in-phase electrons with almost identical lifetimes is generated.

The cluster lifetime should be greater than the time it takes to fly to the anode without dissipation. The time of rapid change dt should be commensurate with the relaxation time of quantum vacuum fluctuations. Rapid potential changes due to dV/dt affect only light and fast particles such as electrons.

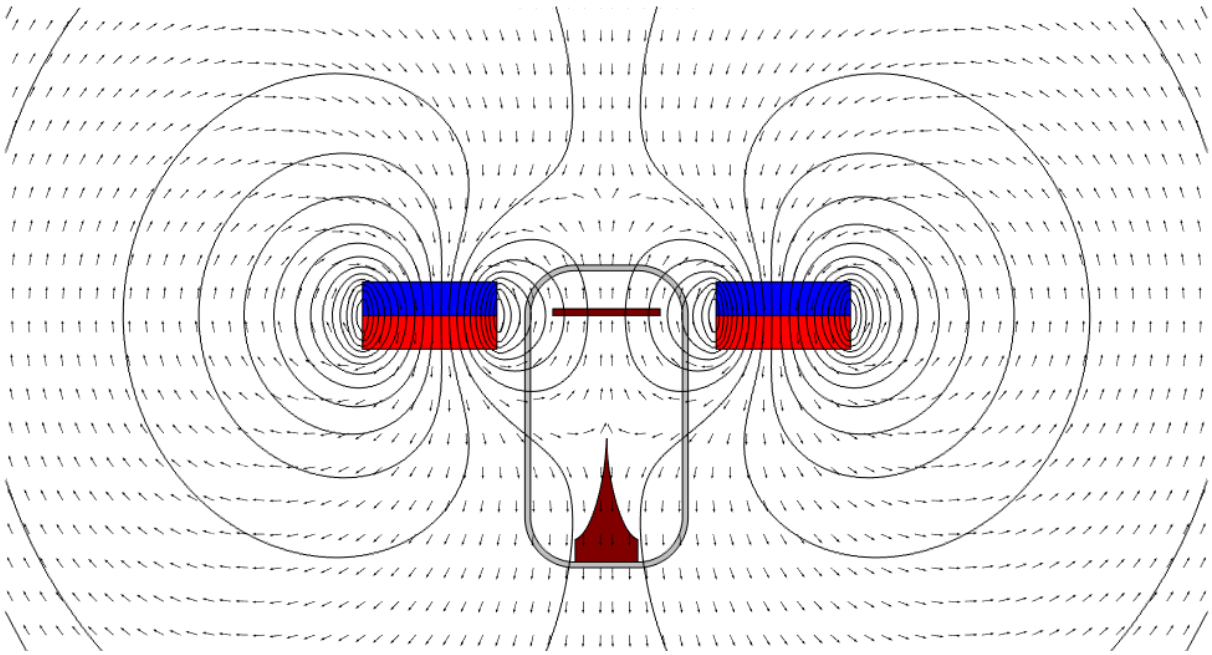


Step 3. - electrons phase change

Although well known in vacuum tube technology, the space charge effect has not a well defined theory, because the formation of a stable space charge is supposed to be prevented by the Coulombian forces between electrons. But it has been discovered experimentally that the repulsion force can be screened by a vacuum polarization generated by the formation-annihilation of virtual charges pairs as a consequence of quantum fluctuations predicted by Heisenberg uncertainty principle.

The lifetime of such particle-antiparticle couples is inversely proportional to their mass-energy, but during their short existence may act as the charges in the solid dielectric of a capacitor.

The concept of electron phase change and electron cluster formation in phase relate to the behavior of electrons under specific conditions that allow access to vacuum energy. Dr. Rossi states that the vacuum reaction produces energy when electrons in phase transfer energy to electrons not in phase.



Step 4. formation of electrons clusters in phase

Formation of electron clusters in phase is the process in which the bubble adds additional polaritons to the polariton aggregation (A polariton is a quasi particle that represent mixed states of light and matter).

To form a coherent cluster of electrons, a sufficient number (concentration) of free electrons is necessary. Given the low probability of polarization, a significant supply of them is needed, much greater than the number of electrons in the cluster. As a source of free electrons, Dr. Rossi's patent proposes to use an electron gun with cathode and anode, similar to that in an electron tube.

Vacuum polarization arises when virtual charge pairs, such as a virtual electron and positron, are displaced slightly by an external electrical field during their brief existence. The effects of vacuum polarization predict the presence of an attractive force between conductors, the Casimir force. The charged cluster (EVO) is produced through the initial production of a superconductive molecule that acts like a seed in which the EVO forms. At the first stage, a cluster of coherent electrons is formed. The electron packing density of the electrons in the cluster is not yet so high. At the second stage, the cluster begins to interact with vacuum particles through the Casimir forces. The Casimir forces compress the cluster. The compression continues until the Casimir forces balance the repulsive Coulomb forces. During compression, the cluster charge density increases, and the characteristic dimensions of the cluster decrease by a small value. In this case the Casimir forces perform elementary work increasing the potential energy of the cluster.

If we imagine a cluster as a spherical capacitor with a defined capacitance, then when the cluster is compressed by Casimir forces (with a constant charge), the potential of the capacitor increases by a certain value, respectively increasing the electrical energy of the cluster.

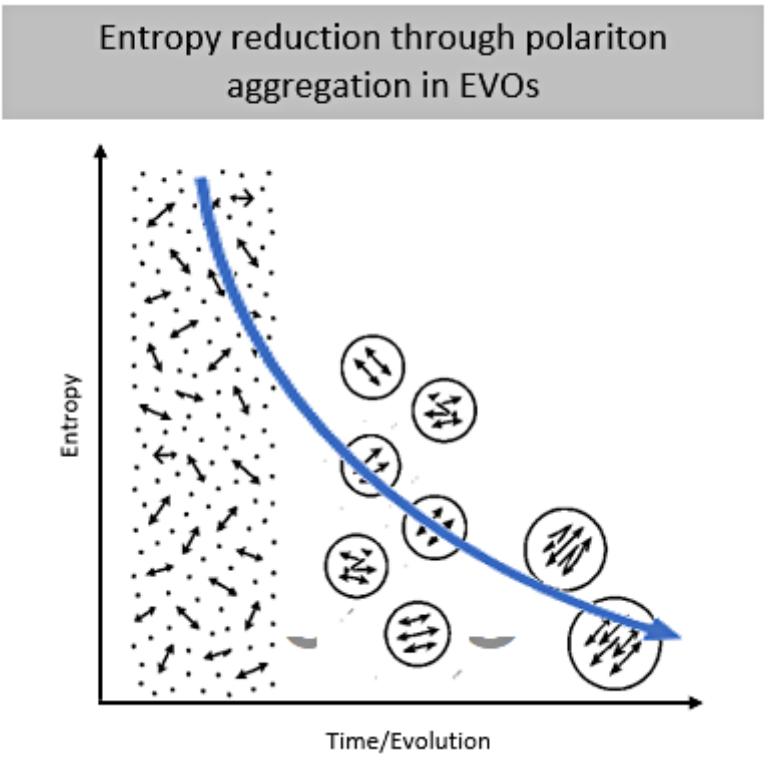
Interesting point about the importance of the number of free electrons. A distinct zone then separates these from cluster electrons. Does the boundary, perhaps it should be called the event horizon, form the Casimir containment? Captured electrons lose (transfer) their energy to the free electrons. Free electron energy is constantly being drawn away by the external load so that energy can't convert cluster electrons at Bosenova, only new energy can.

Random Electrons ->	Velocity Modulation (field on) ->	Clustered (In Phase)
e- e e e e- e e- e- e e- e e e- e- e	e→ e↓ e↑ e←	eee eee eee eee eee

Step 5. decrease in entropy, < thermal capacity, < freedom degrees

Entropy is often associated with heat engines where the 2:nd law of thermodynamics governs the principles for the working media in the engine. Entropy can be associated with ZPE where polaritons is the working media. Polaritons are quasi particles that represent mixed states of light and matter.

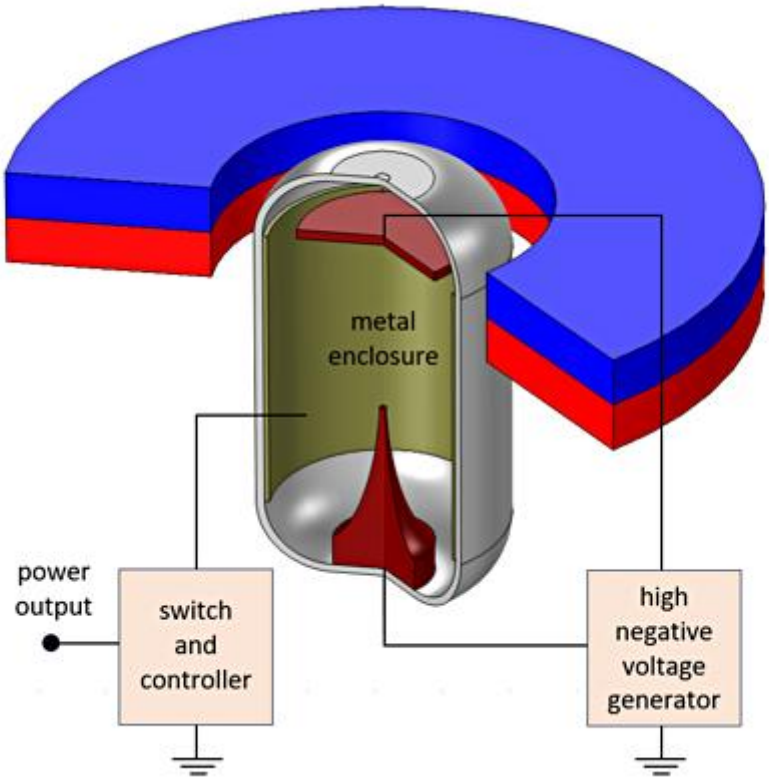
Charge clusters (EVOs) may form compact nuclear aggregates whose coherence determines a reverse difference of entropy, from which derive to minor thermal capacity, minor freedom degrees. It is this reverse difference of entropy that frees the Zero Point Energy, eventually transferred to the electrons not in phase. Decrease in entropy, less thermal capacity, minor freedom degrees is the process by which many charge clusters (EVOs) over time increase in the number of polaritons in their aggregations which serve to reduce the overall entropy in the system.



Step 6. transfer of energy to electrons not in phase

In general, transfer of energy to electrons not in phase means when each instance of the charged cluster (EVO) growth reaches an unsustainable size, the cluster explodes in a Bosenova which returns the electrons and photons back to their original incoherent states.

The cathode is maintained at a high negative voltage, so that while the chamber wall and anode is connected to ground, free coherent electrons will be accelerated into the chamber and travel ballistically to the anode. After an elaps of time, the camber wall is isolated from ground by a switch so that any free electrons that impact it cannot be discharged. When sufficient in-coherent electrons have impacted on the wall that it is now charged to the same voltage as the cathode, free electrons will no longer be compelled to enter the chamber. There will, however, be electrons that remain in transit between the cathode and anode as free electrons. As those free electrons impact on the surface of the chamber wall, they charge the chamber wall. The repulsion of the electrons bound within the chamber causes the surface of the chamber wall to become charged to a greater voltage, thereby providing a method for producing a voltage in a circuit.



7. emission of energy

Emission of energy could mean the stage where the Higgs field reforms the aggregations of electrons and photons back to their original states but with additional energy that has come from quantum mechanical processes.

Output of energy is a different thing. An electric circuit for harvesting the power is proposed in Fig.2 in patent AU2021282556 shown below (partly redrawn, credit to Yury). The circuit in Figure 2 is simple and clever. Vacuum chamber (1) is electrically insulated from the circuit by toroid (4) where the spool (L2), spool (L3) and toroid (4) acts as a transformer. Transfer of power is a 4-step process related to the vacuum tube breakdown voltage of the cathode - anode, relaxation time and breakdown current. The four capacitors to the right in Fig. 2 and spool (L2) has a resonance frequency equivalent the capacitance of the vacuum chamber and spool (L3), thus at resonance frequency power is efficiently transferred from the vacuum tube to the rectifier bridge and further to the 12Vdc output.

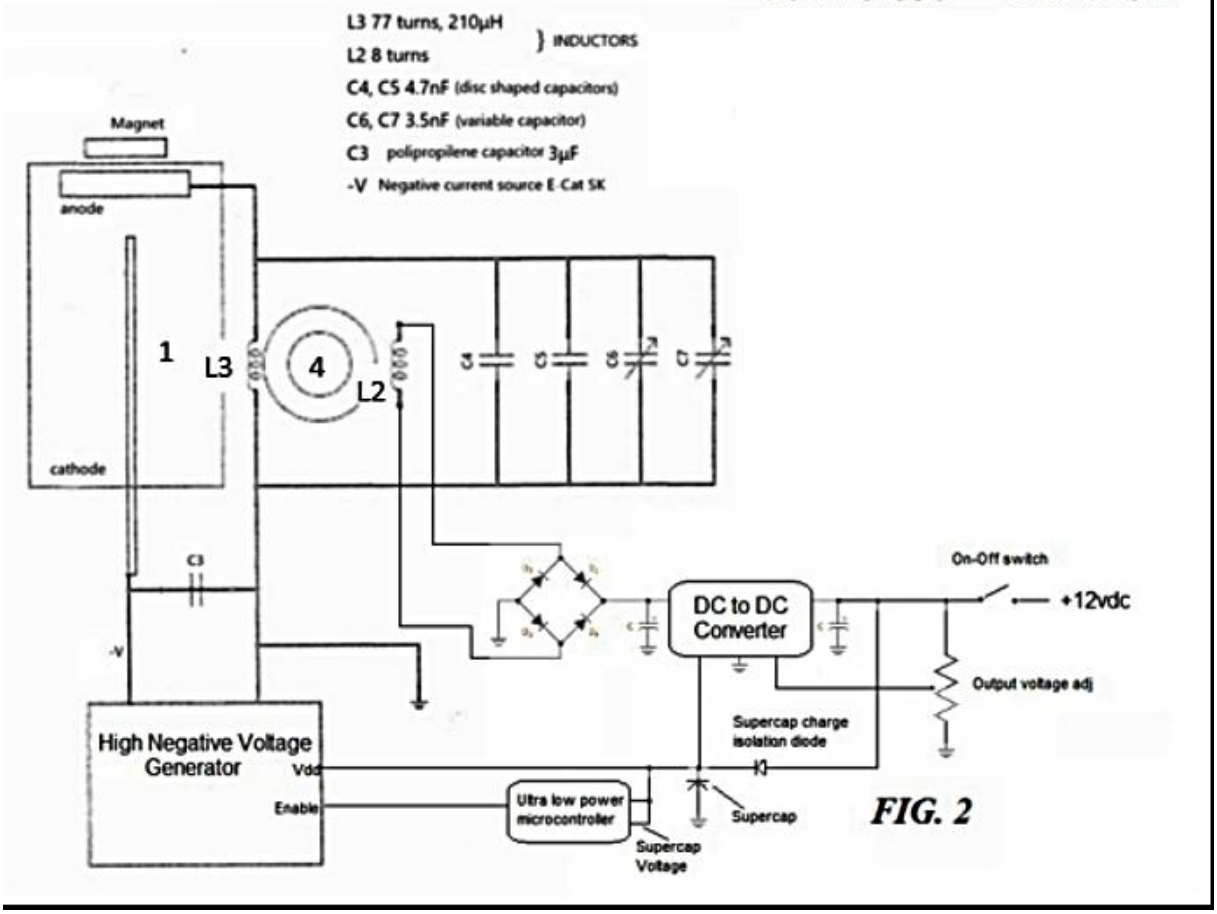

L3 77 turns, 210µH
L2 8 turns
} INDUCTORS
C4, C5 4.7nF (disc shaped capacitors)
C6, C7 3.5nF (variable capacitor)
C3 polipropilene capacitor 3µF
-V Negative current source E-Cat SK
Magnet
anode
cathode
1
L3
4
L2
C3
-V
High Negative Voltage Generator
Vdd
Enable
Ultra low power microcontroller
Supercap Voltage
Supercap
Supercap charge isolation diode
DC to DC Converter
On-Off switch
+12vdc
Output voltage adj

FIG. 2