

Review Paper: Energy Science and Technology

J Aetherom Res 4, 5: 1-84 (2025)

Critical Appraisal of XXIst Century Energy Science and Technology (3): Nuclear fusion, LENR and anomalous plasma electrodynamics

Paulo N. Correa & Alexandra N. Correa

Aurora Biophysics Research Institute, Concord, Ontario, Canada

Abstract

In the last of a series of papers on energy science and technology, we survey the wide field of theories and devices that claim energy in excess of breakeven (with a coefficient of performance, $COP > 1$).

1) On the side of nuclear reactions, it encompasses thermonuclear fusion, so-called cold fusion, its generic replacement by low-energy nuclear reactions (LENR), and the aetherometric discoveries of heretofore ignored gravitationally-confined and electrodynamically-driven hydrogen fusion pathways. These two discoveries cast as much severe doubt on the feasibility of achieving controlled fusion by greater and greater injections of thermal power into magnetically and inertially confined hydrogen plasmas (a shotgun approach), as on the accuracy ("veracity") of claims that ubiquitous LENR reactions simply source excess heat. In effect, Aetherometry argues that there is no such thing as low energy reactions, for three reasons: 1) no fusion reactions directly generate blackbody photons (heat), period; 2) *most* claimed signature-transmutations are based on deficient and incorrect nuclear physical theory; and, worse still, 3) they stem from poor experiments whose data is insufficient (or nonexistent) to substantiate the claim. A case in point is the incredibly preposterous claim that the PAGD reactor is the simplest ever LENR reactor. In effect, though the PAGD reactor emits light and heat, what it primarily releases is electric energy in excess of breakeven. The whole LENR theory is a boondoggle that not even the Widom-Larsen (WL) theory can save.

2) On the side of anomalous cathode reaction forces deployed by particular plasma discharges, the present communication surveys the pulsed abnormal glow discharge (PAGD), vacuum arc discharges (VAD) and interrupted vacuum-arc discharges (IVAD). The metallographic signatures of these discharges *in non-hydride, non-oxide and non-permeated* cathode metals have long been known, and their deployment of energy in excess of breakeven, whether thermal or electric, is not directly connected to any particular set of LENR-induced transmutations. The absence of neutron and gamma-ray signatures in these discharges is also a strong argument against such a preconceived assimilation - and tallies with the willful disregard for simpler explanations, such as Aspden's law of electrodynamics, or the aetherometric treatment of the same.

Other plausible devices ("electromagnetic", piezoelectric, etc) that claim $COP > 1$ are also surveyed.

Despite all the hoopla over the past 4 decades, few of these excess energy devices and theoretical approaches in each category are found to have survived detailed scientific and technical scrutiny. One of the worst outcomes has been a modern systematic falsification of basic science that charted successive metamorphoses which first turned "cold fusion" into LENR, and then illegitimately absorbed into the latter the electrodynamics of anomalous plasma discharges. Probably this perverse distortion could not be otherwise, since conventional *and* alternative physical theories all have in common an inadequate grasp of electrodynamics, starting with what is an electron and what it does - what it can and cannot do; so, given such limitations, how could their grasp of nuclear physics be better than their grasp of electrodynamics? It simply can't.

TABLE OF CONTENTS

Abstract

Introduction -

The colossal failure of the energy technologies of contemporary civilization

1. Energy in excess of breakeven in nuclear fusion

1.1. The fundamental mistakes of nuclear fusion physics

in both of its embodiments, conventional thermonuclear and alternative 'cold ' and LENR fusion.

1.2. The Correa nonthermonuclear fusion pathway

1.3. The Pais fusion reactor

1.4. Brief survey of other claims to nuclear fusion and LENR

2. Energy in excess of breakeven in electrodynamic plasma reactors

2.1. Brief history of anomalous cathode reaction forces in plasmas

2.2. Discovery and development of the PAGD plasma regime

2.3. Application of Aetherometry to the PAGD/IVAD plasma research

2.4. Recent work on the PAGD regime at the *ABR Institute*.

2.5. How the Correa PAGD reactor became

"the most wonderful LENR reactor" ever invented!

3. Other devices that claim COP>unity.

3.1. The Motionless Electromagnetic Generator

3.2. Pais' piezoelectric superconductor

3.3. Whatever happened to Shoulders' plasmoids, EVs, HDCCs or EVOs & etc?

4. Some conclusions - A word to the wise

References

Appendix 1

Appendix 2

Appendix 3 - On the Mallove-Rothwell confrontation re Cold Fusion/LENR

Note on the authors (paraphrasing the last situationist)

Dedicated to the memory of two of our greatest and closest friends,
eminent physicists and "gleeful partners in mischief",
who spared no effort to help our research into pulsed plasmas,
nuclear fusion and the development of the science of Aetherometry:

Dr. Eugene Mallove (1947-2004)

Dr. Harold Aspden (1927-2011)

Introduction -

The colossal failure of the energy technologies of contemporary civilization

The last century was replete with claims of new energy sources or methods to generate power - from thermoelectricity to splitting the atom. Most of the ideas behind them were seeded in the XIXth century. For example, the photovoltaic vacuum cell as the precursor of the solar film. Many inventions went through some form of development, but the majority left but a trail of technological failures strewn across the path of academic, military and corporate research. The "civilian" outcome from the WWII Manhattan Project - the creation and engineering of nuclear fission power plants - had the greatest impact as a new energy source and became the focus of the most intense technological development. But it also features the worst social, medical and biological disasters: Chalk River (1952), Three-Mile Island (1979), Chernobyl (1986), Fukushima (2011), and countless releases of radioactivity to the air and bodies of water, should forever remind social collectivities of the lethal consequences of run-away reactors and nuclear pollution with neutrons, ionizing radiation and radioactive isotopes. Recently, it was reported that the Cape Cod nuclear reactor would release radionuclide-contaminated water to the bay during its decommissioning [1]. But, joke of all jokes, it turns out that it had been doing it for the past 40 years!

The social temptation to expand reliance on fission power plants is at present enormous. Fission has been the effective core support of all energy grids. But even in the form of the so-called "ultra safe" Micro Modular Reactor (MMR), it still employs uranium-235 and secret (!) fuel mixtures of other radioactive isotopes. No matter how well regulated and contained is the chain reaction, it would be simply demented to spread these MMRs all over the planet. But that is the "Big Plan" right now.

Next to nuclear fission plants, most of the high-budget research in nuclear physics has been directed to the implementation of nuclear fusion. By the latter is meant

"thermonuclear" fusion of hydrogen using so-called methods of (plasma) containment. We will discuss it below - but aside from a few "Eurekas" and after 80 years of research, no controlled release of energy from "thermonuclear" fusion has happened.

Improvement of the Internal Combustion (IC) engine and the burning of chemical fuels (from coal to the oxidation of biodiesel and alcohols) has been another target of intensive research and development, forced less by market competition than by social constraints on certain polluting emissions, carbon dioxide in particular. No one should dispute the destructive impact of these dominant methods of energy extraction. Their adverse impacts are well documented by now.

Since the 1990's, the largely manufactured shift of public opinion in favour of the scientific research and development of alternative energy sources was directed and concentrated to eradicate very select CO₂-producing power and propulsion technologies, by advancing at a huge cost to taxpayers the industries of solar panels and wind megagenerators that have now, at last, turned out to be catastrophic failures and ecological disasters. Hydrogen (hydrogen/oxygen recombination) fuel cells are another dead end for reasons already discussed [2]. The focus had been taken away from the dangers of power-generation from nuclear fission, which continued (*et pour cause!*) to serve as the backbone of the energy grids. It was a grand farce aimed at retaining the centrality and control of a universal power grid.

To secure the greatest financial fraud ever perpetrated on citizens the world over, the "post-modern" federalistic States and the pernicious institutions of the UN, along with hosts of sired NGOs engaged in widespread economic depredations and political corruption, managed to invent a new religion, a "laic religion of science" or, rather, pseudoscience, anchored on the weakest of all physico-chemical disciplines - meteorology - and furnished with all the trappings of the most sensationalist media alarmism that so attracts fanatics and distressed adolescents. At first, it was a doctrine of CO₂-caused "Global Warming", but it rapidly degenerated further at the hands of computer modellers in the Obama era into the more ambitious and ridiculous "Science of Climate Change". Whether it makes one laugh or vomit, this is the central tool used in the past quarter century to implement from the top down the most intense social change ever since the time of WWII. It functioned like a giant, global vacuum-cleaner, aspirating every social fad in its path - embrace of the EVs, ecogreen movements, feminism, transectionalism,

transgenderism, DEI doctrines, the "progressive" charters of intelligence agencies, and on and on. All social evils were held to have their roots in "climate change", as the planet marched toward a death by heat. Over decades, dire pronouncements were made of the coming "End of Times" - by leftist and conservative politicians alike, servant scientists, corporate types (even those who managed oil and gas behemoths!), retarded teenager clowns and fake musicians, Hollywood starlets, priests and ministers from old Christian churches desperate to remain relevant, even self-styled rabbis. A long procession of imbecilic believers became the uniparty line that spread all around the "globe". Even Amazonian tribes - or, rather, what is left of them in the form of pernicious NGOs - joined in the fight against "Global Warming". At last, this was a truly universal religion that every moron could join. When it finally became expressed by a neo-capitalist market of "carbon credits" (really, imaginary CO2 futures), the pseudo-elites and the Green-Fascist corporations and NGOs had found a new means to enrich themselves by sucking the entire wealth of economies and nation-States. One could treat these *unsustainable* alternative energy technologies as if their practical failure was meaningless, because in the market of carbon credits they remained financially sustainable, or feasible, since they still generated tremendous returns, and continue to do so.

Grandiose claims of "energy freedom" accompanied this giant expropriation of wealth from poorer citizens to enrich corporate institutions and the pseudo-elite of executives groomed by the WEF: all industrial pollution, whether from internal combustion, coal burning or nuclear sources, etc, would be brought to heel for the sake of creating a new era of "healthy living" that "protected natural ecologies". Beautiful lies were told. Countless politicians and greedy sausage-makers sold myth after myth, lie after lie, green scam after green scam, to a gullible public avid to consume still more. Overnight, irrelevant drama teachers or comedy actors became prime-ministers and presidents of nation-States, bringing social, economic and military catastrophes to their own countries. All the better, since the public everywhere had become addicted to a reinvigorated show-game, constantly watching it on smart phones, seeking the alerts, in a state of anxious hope for some future that never arrived. Nothing has been more destructive of "the human spirit" than this socially-engineered state of permanent alarmism and anguish. Who needs the old oedipal content, when "actual anxiety" - to be sustained at high intensity by every

human being - can be induced, all over at once, by such a social machinery? A terrific sickness took over the planet. A global derangement.

It is only now, in 2025, that public opinion is *slowly beginning to turn* the corner - discovering in astonishment how solar panel plants and massive wind-driven power generation serve no alternative-energy solution and, instead, created a new series of rather severe social and ecological problems. The collapse of the EV market is symptomatic of this ongoing social dislocation of opinion and power. Arrogant European countries led by the UK and Germany have put in evidence the sheer madness of adopting these "green" technologies, while plunging entire nation-States into an eternal debt that ceaselessly grows by leaps and bounds, and relentlessly impoverishes all the peoples of the planet. Instead of the baron-capitalism of North Sea Oil, we got immense fields of mega wind "turbines" (thanks to Siemens and other corporate monsters) that disrupt ocean life, animal husbandry, farming and the ecology of birds - not to mention the sanity of all those who dwell near them. Entire fields of these atrocious machines and their pylons will have to be dismantled at a terrific price. Consider how an ordinary German, even if he can afford the cost, can no longer in fact heat his abode in winter - or how the German economic engine ground to a virtual stop in 2023-2024. Or, how many trillions were made by all sorts of looters with special FIT programs that social-democrat, liberal and conservative parties everywhere implemented at the taxpayer cost in the past 3 decades. It is staggering that masses of people voted to be so completely disenfranchised of effective wealth and basic rights - to a productive life in health and liberty, and the pursuit of happiness.

The fact, then, is that 75 years after WWII, the social problem of finding an energy source that is reliable, clean and abundant has found no practical solution, while in the meantime the energy demand grew exponentially beyond wildest projections. Perhaps a demographically less dense planet might have been satisfied with Tesla's hydroelectric plants. But that is neither here nor there, since the energy demand has a growth curve that no technological offer can match, and no economy can control - save by astronomically increasing the cost of energy consumption.

It is in this context that one should read the present communication - as the third and last of this series on energy science and technology. It may well be that the social problem of energy cannot be solved unless a new energy science is seriously taken up. We propose that the failure of *thermonuclear fusion* is exemplary in this respect - the basic

science behind it is flawed, and below we shall demonstrate this succinctly. The LENR hoax is also exemplary of this failure, with the added "bonus" that it claims to provide such a new energy science and abundant excess heat. Yet, its generalized transmutationalism is mostly bogus and *ad hoc*, with the dire result that the entire LENR field failed, after nearly a half-century, to produce a single *working prototype* of an actual power generator.

To achieve controlled fusion, and do so at virtually any ambient temperature, what is needed is a functional understanding of the inherent *physical* and *chemical* consistency of nuclear reactions. Invariably, such an approach will have to demonstrate the futility of the neutrino hypothesis and the symmetry errors of the transmutations of nucleons *and* in pair-production/destruction [3]. Only our work in nuclear physics has deconstructed these basic errors. Likewise, a new physics is needed to understand the presence of anomalous reaction forces (in particular in defined regimes of plasma discharge), and how reactor systems may use them to release energy in excess of breakeven (COP>1).

The rubric of the present communication has a wide scope that we shall strive to focus - and where a vast net hardly catches any fish worth eating. It turns out that, as far as we are concerned, no plasma device that we know for a fact other than the PAGD reactor that we invented, has *effectively demonstrated the existence of energy in excess of breakeven with working prototypes*. Possibly, Spence's device also did so [4]. Yet, there are today a million false and erroneous claims to devices with COP>1. Most are not worth a serious examination, so mindless and debile are the so-called proofs, technological embodiments, supposed energy measurements and quasi-analytical arguments. Their list is long, with claims of magnetic motors and inductive couplings sourcing excess energy at the very top, followed by another long list of cold fusion/LENR reactors (remember the Rossi fiasco?). It is hardly worth our time to take these spurious devices at face value and debunk them one by one. Sisyphus' work.

Instead, we will largely focus on two technologies that have been, or can be, engineered to release more energy than is employed to drive their processes: nonthermal nuclear fusion and autogenously-pulsed plasma electrodynamic reactions. In either case, the spent energy is the amount of work that must be done to tap the energy contained either in the "hydrogen fuel", or in what is called "the space medium" by means of a

cathodic consumption (erosion of the cathode is the byproduct of the reaction, so the cathode must be treated as a "fuel").

H. Aspden long ago proposed and explored the existence of a series of such anomalous reaction processes in vacuum-arc discharges (for which he got a patent), thermoelectric converters and even in magnetic reluctance motors that might serve as power generators (for which he provided preliminary data [5]). C.F. Bohren, in 1983 [6], showed that a particle could be made to absorb more energy than just the light incident on it, *as if* surrounding light (the incoming electromagnetic field), at or near the particle's resonance frequency, were to be focused on the particle by a convergent lens. He claimed his experiments validated the *excess energy effect* generated by "surface plasmons" (In UV absorption) and "surface phonons" (in IR absorption). Later, T. Bearden pointed to the Bohren effect as the scientific basis for COP>1 systems [7]. Though we have elsewhere provided a different interpretation of the Bohren effect (based on the electrodynamic topogeometry of electrons when targeted by *directed resonance at high energy* [8]), the point is that excess energy systems exist naturally in apparent and local defiance of the Second Law. We are not referring to Prigogine's dissipative structures, or any such thing. The Bohren effect is electrodynamic, not thermodynamic - even if Bohren claimed an electrosonic component.

Yet, no embodiments of such overunity technologies have even reached the stage of proof-of-principle prototypes, let alone commercial ones. It is a dismal failure. But perhaps it should not astonish anyone - it is the marketing principle of "the smart vacuum-cleaner": for 6 decades now, "smart robot vacuum cleaners" have been advertised that could clean home and office, including every hole and cranny, and yet to this day, no such simple consumer device actually exists (that works, that is)... But the more fundamental basis of this failure is a scientific one, nested right at the heart of conventional physical theory. Nature is sufficiently complex that a shot in the dark, a shotgun approach to chaos, has little chance of success.

1. Energy in excess of breakeven in nuclear fusion

1.1. The fundamental mistakes of nuclear fusion physics

in both of its embodiments, conventional thermonuclear and alternative 'cold ' and LENR fusion.

The aim of achieving a breakeven machine using the fusion of hydrogen atoms began during WWII, with Edward Teller's work for the Manhattan Project. In over 80 years, the extremely costly effort failed to build a fusion reactor that would work as per the thermonuclear reaction that conventional physics claims is *the only* pathway to sustain hydrogen fusion. *Somewhat* aware that in stars the fusion process employs gravitational containment of the hydrogen plasma, conventional physics chose to pursue two other ideas of possible containment - inertial and magnetic - which have squarely failed to generate a single believable instance of a $COP > 1$. Inertial confinement reactors seek to implode the target protons with laser beams, while confinement with external magnetic fields requires large machines and regularly induces the evolution of plasma instabilities. The facts stare us all in the face: zillions spent in tokamaks, proton colliders, and other fanciful complex machines generated no returns, either in basic energy science or technology. Predictions of super particles, like the Higgs boson, to be found by such machines and their precursors turned out to be pure fictions, and the few claims of breakeven reactions were subsequently recanted. Even the much glamorized Safire I Project (see below) appears to have fared no better with its ultra-costly laser-inertial containment of hydrogen plasmas. It suffered from the same obstinacy in pursuing the myth of thermonuclear fusion.

Recently, China's EAST reactor (tokamak) team reported a breakthrough in sustaining a thermonuclear fusion plasma fed by tritium and deuterium under magnetic confinement. It claimed the plasma ring lasted 1,088 seconds at some 180 million degrees (kelvin), as a result of doubling the power of its heating mechanism [9]. Not even a month later, it was outperformed by France's WEST reactor - which reportedly sustained a hot "fusion plasma" for 1,337 seconds at some 150 million degrees, upon injection of 2MW of heating power [10]. Yet, neither reactor was able to release more energy than it consumed, and *neither team provided proof for the presence of fusion products*. In effect, maintaining a chaotic "boiling" plasma ring is not the same as sustaining a controlled or directed fusion reaction. Moreover, unlike these "artificial suns", the fusion reaction in the core of the Sun is not confined magnetically, nor driven by thermal power or avalanches of

electromagnetic energy; it also releases no neutrons or gamma rays. It is confined gravitationally, and driven electrodynamically in the absence of any input heat.

Two simple interconnected reasons - physical reasons at that - account for this monumental failure of the search for *thermonuclear* fusion, that equally apply to the failure of so-called "cold fusion" or, as it is called nowadays even more laughably, LENR (low energy nuclear reactions):

1) That the natural gravity-contained nuclear fusion present in the core of stars is *not driven thermally or electromagnetically, nor does it directly generate heat or light*. In fact, it is driven electrodynamically, and proceeds *without* the production of any photons at all - whether heat or light, or ionizing photons. It only generates fusion products (massbound particles, ions really) *and ambipolons* of exact values. Twenty-two years ago, we discovered and aetherometrically analyzed in detail this fusion process. In 2005, we publicly divulged its full reaction path [11], and in 2023 we detailed the actual gravitational confinement and the complete basic set of reactions shown below [12].

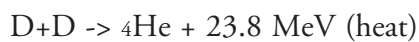
2) The pathway of the actual fusion of deuterides proceeds by a very different reaction that all nuclear physicists, for the wrong reasons, have considered to be forbidden and impractical, and thus have not bothered to explore. We published the basic reaction in 2005 [11], in the context of our severe criticism of Peter Hagelstein and all the peers assembled at ICCF (International Conference on Cold Fusion) for their inability to realize that the reaction they sought as the key to the so-called "cold fusion" was the wrong one. We were wholly ignored or derided.

Yet, actual nuclear fusion of deuterides proceeds neither by the thermonuclear pathway of official science, nor by some "cold" or "low energy" reaction - that has so far managed to elude ICCF physicists, even as LENR transmutations multiplied like rabbits. Further, it also cannot be explained by neutron-mediated reactions, for much that the Widom-Larsen theory may explain any of the so-called LENRs and their transmutation products (the S. Krivit "school of thought"). Neither Krivit or Hagelstein, nor the acolytes of J. Rothwell in the LENR organization(s) really understood anything about fusion processes. They still don't - and keep spinning over the same errors (errors like this, that are self-programming, or self-fulfilling prophecies, are what one should define as *viruses of the mind* - autonomous bit-dogmas that immobilize thought in every direction). However, the ironies of fate regarding our own work were not yet done with these cold-fusioneers - as

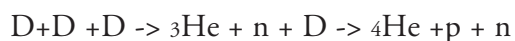
we shall see below when addressing the twist which our work with auto-electronically emitted cold-cathode plasmas took, when it became acknowledged and acclaimed by some LENR people...

1.2. The Correa nonthermonuclear fusion pathway

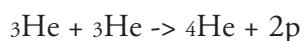
The 2004 DoE report had correctly pointed out how cold-fusioneers were wedded to the notion that the claimed excess heat-generating reaction produced ${}^4\text{He}$ as its ash signature in amounts commensurate with an arbitrarily postulated mechanism for the fusion of deuterides:



This was all along a pie in the sky, an imaginary shortcut for the lazy and meek in spirit. No such reaction ever existed. As we explained at length in that 2005 paper, there is no magic that can convert the production of gamma radiation of 23.5 or 23.8 MeV into heat having the same energetic value. In fact, both that DoE report and the cold fusioneers made the glaring mistake of classifying all proton emissions near MeV as “Nuclear Emissions not Attributable to Deuteron-Deuteron Fusion” (section 5.5, p. 13 of the 2004 DoE Report), failing crassly therefore to appreciate how, in the absence of “thermal neutrons”, anomalous heat can only be evolved secondarily from the absorption of such protons. Bimbos! This has been a critical error which the field has persisted in making to this day. Though aware that there is a different fusion pathway that generates neutrons and protons - as given by



the cold fusioneers were unable to see how they could transform the products of the first reaction so that the resulting neutron would be pre-empted, and the proton absorbed so that the reaction would release heat. It required a two-step process, whereby from the fusion of ${}^3\text{He}$ with itself, the terminal protons would be forced to shed their kinetic energy either in the form of heat or electrodynamically:



Instead, the cold fusioners ignored Mallove's advice in the very last editorial that he wrote (*Infinite Energy* #55): the “real danger [is] that one or more theorists will try to push their [erroneous] theory too far and will put the field in a position from which it would be hard to recover”. With the Hagelstein et al's model of an imaginary single-step reaction they chose to do just that - opting for a simplistic approach based upon an *ad hoc* model that reduced the complexity (and the breadth) of the problem to a patently untenable fantasy. Mallove's extensive criticism was, in fact, predicated upon the aetherometric understanding of coupled fusion reactions (imparted to him in the Spring of 2003, both personally and via his own access to our research results and to volume IV of AToS that we have, to this day, refused to publish for reasons that we made public following Mallove's murder in 2004), and how this coupling could be electrodynamically controlled to suppress neutron production, while employing the protons as energy carriers. Their energy could be extracted either as heat or electrically, or even in both forms at once.

Already in February of 2004, we had written a memorandum to be sent to Prof. H. Branover, an eminent plasma physicist (in magnetohydrodynamics), that read:

"Memorandum for Prof. H. Branover, Energetics Technologies
February 8, 2004

From: Dr. Paulo N. Correa and Alexandra Correa
To: Mr. Uri Soudak and Dr. Eugene Mallove
Re: Electrodynamically controlled pulsed nuclear fusion reactor
employing vacuum arc technology (patented aPAGD methodology)
with direct electric, thermal and helium outputs

An outcome of the synthesis between the experimental work of the Correias in (1) plasma and (2) nuclear physics and (3) the analytical developments of aetherometric science has been the design of a table-top integral nuclear fusion reactor that is electrodynamically controlled and employs special combinations of materials to layer both the reagents and the reactants or byproducts. In essence, hydrogen and deuterium are fed to the reactor under conditions designed to promote two fundamental types of nuclear reaction which release both short (intense burst) and long-term (low level) sensible heat. These reactions, though serendipitously known (as is the case for the former) or surmised (as is the case for the latter) by existing research in nuclear physics – including so-called cold fusion - have not been understood properly to this day, and are, therefore, effectively proprietary aetherometric discoveries/processes.

To obviate the production of nuclear ash, the byproducts of these reactions are shunted to produce helium, which is trapped in a self-contained heat exchange circuit designed to export the heat and return the coolant to the reactor. The deuterium fuel is also recycled throughout the process. Residual charge from the reaction is separated by the reactor design and fed, in turn, to a vacuum-shield envelope, where it is employed to directly generate electricity by means of an electrodynamically-controlled pulsed plasma discharge operating with auto-electronic emission in the PAGD regime, and patented converter system techniques."

For context, we note in passing that Prof. Branover had originally been charged by the billionaire S. Kimmel to audit our work as a candidate for potential investment.

Kimmel was then financing a now defunct Israeli company (Energetics Technologies LLC) led by I. Dardik, the supposed "inventor" of the ultrasonic "superwave" (SW) that he "discovered" in his medical research and sought to apply to cold fusion. Dardik, an MD and convicted crook successfully sued by many of his patients, became Kimmel's science advisor after supposedly saving the latter's life with one of his 'miraculous SW cures'. But, in 2004, Energetics Technologies was going nowhere with its 'superwave fusion'. It was at this conjuncture - following contacts by E. Mallove and U. Soudak that led to Branover's long visit to our laboratory - that Branover became convinced that our approaches to both nuclear fusion and electrodynamics were an original breakthroughs in physics. Wanting to report back to Kimmel, Branover suffered interference and personal threats, to the point of being denied direct access to Kimmel. Curiously, four years later, Branover's name appeared as a co-author of the last Dardik paper (2008) - in which COPs of >4 were claimed.

About this same memo, Mallove's main sponsor - the billionaire C. Entenmann - would later tell us (on September 2004, after the barbaric murder of Mallove) that we should simply "produce that reactor and then we can talk about investing in making some kits out of it". It was rich! As if we had the means to do so on a shoestring! To others - and not us - he said he was ready to give us \$20k, but we never received one red penny from the gentleman, even as his son-in-law, Dr. J. (Alf) Thompson (who originally introduced Mallove to Entenmann), repeatedly urged him to do so. Until Alf, too, was *murdered* on November 16, 2010, in rather strange circumstances deemed to be a suicide (one day after we had a long phone call about Aetherometry, and on the day we were supposed to talk again to make an arrangement to meet asap in Nassau...).

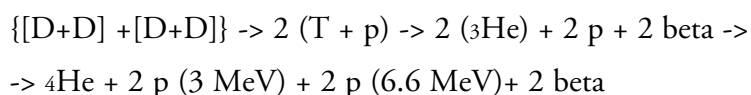
Instead of Entenmann's "free advice" (...such advice is usually the most costly), we openly and publicly explained how the aetherometric model of the desired fusion reaction specifies a physical and nucleochemical process that only exists when it occurs from deuterium tetrads, i.e. when paired synchronous 2(D-D) fusions are promoted [11]. As far as we were concerned, permeation of cathodes (not anodes) with deuterides was of use only when formation of these tetrads could be promoted, and not indiscriminately. Our theory of paired synchronous 2(D-D) fusions was the first major and critical difference between the aetherometric model and that of the DoE proposers/reviewers and the CF

researchers. In this context, we could consider the tetrad pathway that generates neutrons, as a continuation of the second triplet pathway:



But, obviously, this process generates neutrons and entails loss of usable energy, especially in an electrolytic device - so what is the solution to avoid them?

The solution is the aetherometric model of the desired fusion pathway (aka "the Correa solution"), where the sole intermediates are tritons and protons - a reaction which we fully provided in 2005 [11], with the exact electrokinetic energies of the resulting proton intermediates:



Both tetrad pathways involve paired D-D fusions and ^3He - ^3He fusions, and only the last step exclusively employs proton intermediaries that permit extraction of heat or electric energy from their respective electrokinetic energies, with no production of neutrons and complete absorption of tritons. *This is the real reason why, if and when anomalous heat evolution is observed from conversion of those electrokinetic energies, no neutrons or tritons are (or can be) significantly detected.* A truly efficient device that, through intelligent construction, follows these principles and this model, would maximize its thermal and/or electric output by ensuring *minimal proportions of proton and triton leakage, and zero gamma and neutron production.* And herein lies its potential to become a viable, environmentally-clean device that may source substantial electric power.

Our solution fully accorded with the 2002 results of the Mitsubishi group [13] to permit precisely a deuterium tetrad-based interpretation of the pathway(s) of interest. And it was further gratifying to note that the formation and role of 'tritium doublets' suggested by Otto Reifenschweiller's work (reprinted by Dr. Mallove in issue #54 of *Infinite Energy*, in one of his last acts that received so much undue criticism from cold-fusioneers, with the imbecilic E. Storms at the forefront of this opposition) and envisaged by Reifenschweiller himself as having a critical role in "cold fusion", also pointed to the

deuterium tetrad pathway that we proposed - because of its necessary electrodynamic synchronization of 'triton doublets'.

More than two decades have now passed since we made these basic revelations public. Yet, our unsponsored work on "nonthermodynamic" nuclear fusion has remained totally ignored and censored by the cold-fusioneers - better known today as the "LENR propagandists". In 2023, we published under nondisclosure to any serious interested parties the full physico-chemical hydrogen-fusion reaction pathway such as it occurs under gravitational containment in the core of the Sun, starting from the input of 8 "light protons" and 4 high-energy electrons, and written in full aetherometric notation (with no apologies to those who may not understand it, or how exact it is), with *a complete energy balance and no particle omissions* [2]:

$$\begin{aligned}
 & 4 \{p^{+1834} + p^{+1834} + E_{\delta e^{-}} + 3(E_{\alpha e^2}/E_{Ge})\} \Rightarrow \quad \#14,688, 4+ \\
 & \Rightarrow 4 \{p^{+1834} + p^{+1834} + (E_{\delta e^{-}} + E_{k460}) + E_{R1073}\} \Rightarrow \\
 & \Rightarrow 4 \{p^{+1834} + (n_{1837} + E_{k460}) + E_{Ambi51}\} \Rightarrow \\
 & \Rightarrow 4 ({}^2_1H^{+3671} + E_{k460}) + 4 E_{Ambi51} \Rightarrow \\
 & \Rightarrow 4 ({}^2_1H^{+3671}) + 40 E_{Ambi51} \Rightarrow \\
 & \Rightarrow 2 ({}^3_1H^{+5500}) + 2 [p^{+1836} + 3(e^{-}:e^{+})] + 40 E_{Ambi51} \Rightarrow \\
 & \Rightarrow 2 ({}^3_1H^{+5500}) + 2 p^{+1836} + 160 E_{Ambi51} \Rightarrow \\
 & \Rightarrow 2 ({}^3_2He^{2+5497} + E_{k1,003}) + 2 (E_{\delta e\beta^{-}} + E_{k18.6}) + 2 p^{+1836} + 160 E_{Ambi51} \Rightarrow \\
 & \Rightarrow \{{}^4_2He^{2+7298} + 2 p^{+1836} + 2 E_{\delta e^{-}} + 280 E_{Ambi51}\} + 2 p^{+1836} + 160 E_{Ambi51} \Rightarrow \\
 & \Rightarrow {}^4_2He^{2+7298} + 4 p^{+1836} + 2 E_{\delta e^{-}} + 440 E_{Ambi51}
 \end{aligned}$$

Rigorously, we had demonstrated how the stellar fusion reaction results in the generation of the modal 51keV solar ambipolons that form the core of the solar radiation. How it releases no photons - no heat, no light, no gamma rays, nothing electromagnetic or neutronic. Here was proof that, in the core of stars, the most fundamental *nonthermodynamic* fusion reaction is ultimately driven by a gravitational massfree process of cosmogenic creation of electrons injected with extremely high kinetic energy that occurs in the phase-energy continuum. Fundamentally, it results in the production of helions and ambipolons, with no production of gamma rays, blackbody photons or neutrons. In another publication of the same AToS vol. VII, we extended the

aetherometric analysis of other fusion pathways to an entirely new systematization of star types and evolutionary pathways - and made two formal and simple demonstrations of the non-existence of electron neutrinos [3]. We also revealed for the first time the asymmetric processes of proton-neutron interconversion - some 23 years after we discovered them!

In contrast to the gravitationally-contained nuclear fusion seated in the core of the Sun, the stellar process must be replaced - in the fusion reactors that we have designed since 2003 - by the injection of "accelerated", high-energy electrons that target a proton-deuteride plasma which is electroinertially (electromechanically, by the reactor structure) and electrodynamically trapped and aligned so as to undergo fusion and generate helions. The pulsed plasma-arc discharge that drives the fusion reaction is geared to release high-energy protons susceptible of direct electric capture by quenching cathodes - again, with no ionizing radiation being generated. Instead of producing ambipolons as happens in most stars, the reactors also convert part of the electrokinetic energy of the protons directly into electromagnetic heat. The designs we proposed to an interested party tailored the reactor to the exact fusion reaction that we alone have discovered - and first publicly proposed back in 2005. Should we not conclude that the desire to know on the part of institutional and alternative physicists only masks their desire *not* to know?

1.3. The Pais fusion reactor

Though entirely theoretical and devoid of any experimental proof, a fusion reactor was recently designed and patented by the Romanian-born American engineer Salvatore Pais. In the course of his work for the U.S. Navy and NASA, Pais filed 5 different patents, all owned by the U.S. government. In 2022, he stated his purpose - to give the U.S. priority for a potential breakthrough technology in case an enemy or competitor first brought it to fruition. At the time that he worked as an aerospace engineer for the Naval Air Warfare Center (NAWC), Aircraft Division, Pais filed an engineering design for a fusion reactor [14] built with two counter-rotating, concentric fusor assemblies driven by DC motors, that would seemingly achieve high density compression of injected gases (deuterium being preferred), which were subsequently confined by a focused magnetic field and heated by electromagnetic radiation (e.g. lasers). He claims the injected gases (the fuel) may be neutronic or aneutronic, but either way, the output is considered explicitly to be neutrons (see p. 3 of the patent) that generate heat, which is passed onto

exchangers to drive a thermoelectric motor. The fundamental idea is to drive mechanically the plasmas into collisional vortices and employ both magnetic and inertial confinement methods to generate "thermal neutrons". Not much of an alternative to fission reactors...

The text of the patent states that "the present invention can produce power in the gigawatt and terawatt range and higher" (para 42, p. 4). Yet, Pais' patent presents *no experimental data* (unlike *all* of our patents), and Pais' machine has so far remained devoid of any concrete embodiment (that we know of). For that matter, up until 2021, none of his patents had resulted in prototypes [15]. Apparently, according to B. Tingley's 2020 and 2021 articles in *The Drive*, NAWC unfruitfully spent over a half-million dollars in testing Pais' theories. One may quip they got the dessert they deserved.

The patent in question also presents some curious inconsistencies: on one hand, a high-density plasma is sought and needed, on the other a vacuum of 10^{-5} torr is said to be desirable. It skids. And, what exactly is achieved with mechanical rotation that counter-rotating electric fields cannot do for a plasma - is another good question (that equally applies to Safire, see below). Other incongruencies have led critics to suspect the Pais patents of being planted disinformation with a variety of intents. Wikipedia labelled Pais' work as pseudo-science, just as it did our own. Since Wikipedia is a major intelligence operation of dis/mis/mal-information, one guesses its bosses are not exactly happy with the efforts of the Navy's scientific and technical intelligence...

From an aetherometric perspective, by far the greatest shortcoming of Pais' fusion reactor patent is that it pays no attention whatsoever to how deuterium fusion is to be brought about, i.e. to the concrete problems inherent in the desired fusion reaction(s) such as were discussed above. It entirely buys into the thermonuclear paradigm, rather lazily so. We wager it simply cannot work as it stands. It does, however, exhibit an inkling of what we aetherometrically discovered about the seeding of stars by electrodynamic counter-vortices that permit an initial containment of basic fusion processes [3]. But mechanics do not suffice - one must understand the energy physics and the nuclear chemistry of the reactions involved in each case; there is no key that opens all doors.

1.4. Brief survey of other claims to nuclear fusion and LENR

We cannot hope to be exhaustive of a vast field of claims to have achieved some kind of "cold fusion" or LENR excess heat. For the past 25 years, the LENR field has

been condemned to the delirium of transmutations, most of them based on shaky theoretical foundations and very dubious experimental results. The main interest was no longer D-D fusion. The latter became rather reduced to sensationalist news - like the extravagant and inarticulate claims of A. Rossi about the performance of his E-Cat reactor, which provided a whole comic-book narrative punctuated with unending anecdotes about the unscientific character of the doings and sayings of the supposed experts brought in to assess the E-Cat, and with violent or explosive fire accidents. Yet, even as we rather doubt it, one cannot rule out the possibility of the E-Cat having set up conditions for the generation of anomalous cathode reaction forces, whose energy would be converted into heat, much as Aspden's old patent (see below) had suggested could be done. But that is giving Rossi more than he deserves. In his website (newenergytimes.com), S. Krivit has published a feature ("LENR investigations by Steven B. Krivit") that exposes a number of cold fusion researchers for exaggerated or false claims (R. George, M. Swartz, G. Miley, D. Kidwell), falsified reports (M. McKubre at SRI (Stanford Research Institute) International) and outright fraud (Rossi). Though just a small sample of the disaster, it is definitely worth reading if one is to realize the degeneracy of the LENR field of investigation.

By focusing on the production of ${}^4\text{He}$ from D-D fusion, LENR researchers had found themselves at an impasse. On one hand, there are only too many possible pathways from deuterium to ${}^4\text{He}$, and on the other they hemmed themselves in with the thermonuclear myth that D-D (hot) fusion always results in the emission of neutrons, tritons and production of ${}^3\text{He}$. This much L. Jaitner realized when in 2019 he published a long analysis of the role of "condensed plasmoids" (CPs) in the so-called LENR, with the objective of submitting it to "angel investors" [16]. But Jaitner's analysis, too, immensely suffers from the transmutationalist delusions that serve as the *subsistence diet* of the LENR field (see below for an exemplary proof of this shortcoming). We must understand his analysis in its proper epochal context.

Since 1989 and until 2011, the U.S. Navy led the research into "cold fusion" and then LENR, through its SPAWAR (Space and Naval Warfare) Systems Center [17] and the NRL (Navy Research Laboratories). As far as we were concerned, it was clear to us that after Mallove's murder, *Infinite Energy* became a U.S. Navy mouthpiece. Through its various laboratories and grants to associate facilities (like SRI Int), the U.S. Navy simply dominated the LENR field. In 2011, members of the key research team at SPAWARSC

retired [17], and a final report of the Defense Threat Reduction Agency (DTRA) on "nanonuclear reactions in condensed matter" was released in 2016 [18]. It claimed to detail "probably the largest, most comprehensive body of work in the LENR field".

This prompted pleas from S. Krivit and M. Ravnitzky (then working at the Naval Sea Systems Command, NSSC, in Washington, DC) to save the LENR development effort. They propagandized the "new" incarnation of "cold fusion": it was not fusion but neutron-mediated low-energy nuclear transmutations that held the key to excess heat, as laid out by the then popular Widom-Larsen (WL) theory [19]. The theory proposed that "ultra-low momentum (ULM) neutrons" derived from "many-body quantum effects" (such as how multiple electrons could transfer energy to a proton) localized "low energy nuclear reactions" that took place in metal hydrides and deuterides, and resulted in transmuted elements. Japanese researchers had reported in 2012 that praseodymium (Pr) was mass-spectrometrically observed to increase in deuterium-permeated multilayers of palladium and calcium oxide (Pd/CaO) that were implanted by caesium ions, and had offered the WL theory as a possible explanation [20]. Since the reactions in question were neutron-catalyzed reactions distinct from those of hydrogen fusion, they were taken to be consistent with the Standard Model.

This was also the path taken by the DTRA/SRI investigations and replications using resin and bubble detectors, with their wet deuterated Pd-anode cells showing production of non-thermal neutrons upon Pd/D co-deposition on the cathode [18]. Concomittant high-energy proton production could not be firmly established, but was inferred. The DTRA report and the experiments (conducted mostly by the SPAWAR Systems Center, SSC, and SRI Int) starkly suffer from an inability to isolate variables. In particular, excitation methods were somewhat haphazardly mixed in each single cell experiment. A glaring example is the report's figure 3.6-8 (p. 64) of a 28 day course (using a nickel cathode), where heaters were applied on and off, with *and* without DC currents or a HeNe laser illuminating the cathode, and employing sonication with Dardik's "superwave" (in the range of 16 to 38 kilocycles) when the DC was turned off - all of this while deuterium oxide was added *ad libitum*, here and there, to the solution! From single points with no standard errors or deviations, inferences are taken regarding neutron production from the number of bubbles in the detector. Not even as a preliminary should this have passed muster. One may well understand how finding evolution of heat (forget

about the epithet "excess") in these typical LENR cells is like waiting for Godot (days go by...), yet this hardly justifies the shoddy methodology. Furthermore, the evidence adduced for the rise in temperature induced by the SW is truly desperate - consider the processed data of figure 3.7-7 of the report (p. 72): *if* the average cathode temperature is obtained when the noisy signal caused by the SW (whose use was largely promoted by McKubre) is present, it peaks at a $\Delta T \approx 0.75^\circ\text{C}$ with respect to the $t=0$ background, and then falls back to background over 1,000 minutes while the SW is *still on*; *and* if the actual temperature is the baseline of the sonic noise, the ΔT is effectively *null*. One might add that, even if this evolution of heat were anomalous or excessive (which definitely was not proven by any of the reported experiments, and effectively was not the case in the example in question), the magnitudes of such ΔT s make them rather useless. If shoddy stuff like this was not sufficient - and following discrepant X-ray measurements between CR-39 and Si-Li detectors - the SSC/SRI researchers went on to spike the solution with radionuclides, such as americium and polonium.

Undoubtedly, absorption of released neutrons ("thermal", "slow" or ULM be they) would result in transmutations - but operation of these cells is a far cry from the original cold fusion hypothesis, which was *aneutronic* in input and output. No wonder the DTRA report suggests that LENR may be best used "to create hybrid fusion-fast fission reactor[s]" (p. 81). Moreover, just how and when ULM neutrons form - especially from a collective electron transfer of energy to a single proton (as apparently suggested by A. Einstein to E. Sternglass, but not without his admonition that it was "not probable", "since I can hardly imagine that electrons of such high voltage are formed in your tubes" [17]) - remains an open question.

Methodologically, the DTRA report on a decade of LENR research did not add anything to the prior suggestions of Takahashi [20] and the findings of Roussetski [21] and Iwamura et al [13] - namely, that triton yields in Pd cells were greater than those predicted from DD reactions alone, and must indicate the presence of the 3D or 4D reactions predicted by Takahashi, or what Roussetski later called "an unknown nuclear reaction" (back to "the Correa solution" described above...). But the DTRA report provided extensive metallographic evidence for craters in the Pd/D layer co-deposited on the cathode. These were deemed to be created by both neutrons and protons from DD and DT reactions. Most poignantly, however, it concluded that "the observed charged particles

[whether protons or alpha particles] and neutrons do not correlate with heat"; that "another reaction was primarily responsible for the heat generated" by the cell, and that this reaction "is aneutronic" (sic, see p. 70 of [18])! It then presented thermal evidence that the cathode was the heat source. However, on the cathodic Pd/D co-deposition layer, the DTRA researchers found tracks similar to those etched by charged particles *and neutrons* (of ≥ 9.6 MeV) from DT implosions, leading the DTRA report to incoherently conclude that the heat source was neutronic after all. An SEM metallographic analysis showed that most of the vaporized Pd from the anode deposited on the cathode, that it was deuterium-loaded and formed amorphous splatter bubbles ("cauliflower-like"), some of which looked like volcanoes once the deuterium outgassed from their center.

Much too much was made of metallographic findings like these, by the LENR crowd. Somehow it was gratuitously assumed that all electrode craters and splatter were born equal and a sure sign of nucleonic, if not neutronic, processes. But metallographic identification of craters, mounds or splatter is simply not sufficient as evidence for LENR transmutations or the WL theory. It is well established that they can just as well be signatures of auto-electronic emission processes. In fact, let us perform a simple exercise (that is also relevant to the next section) of contrasting the SSC/SRI results with those of our own examination of PAGD electrodes [23]. The most obvious differences are that:

- 1) In the PAGD regime, cratering is observed in cathode. Most often the edges of the craters are smooth, but sometimes they are sharp. The electronic-emission craters do *not* look like either the amorphous (bubbly) volcano-like structures or the splash-impact craters present in cathodic Pd/D co-deposits. The PAGD crater core is formed, not by the outgassing of any substance, but by the electric carving of the metal generated by the rapidly gyrating cathode spot - i.e. the electron plasma ball. Its tracks can be easily visualized [23]. They are not present in Pd/D co-deposits.

- 2) Though the DTRA report presents no metallographic examination of the palladium anodes, no cratering is observed in the PAGD anodes. Instead, what is observed are metal *mounds* that result from the anode being impacted by Al^{2+} plasmas that *originate in the cathode* (not in the anode) - that were carved and expelled when the cathode ball "exploded" and transferred its energy to the aluminum plasma. Depending on operational parameters, one can see (and hear, by its characteristic ping) the molten aluminum balls hit

the anode with such force that they rebound, splattering the reactor envelope and sometimes hitting back at the cathode.

In effect, such basic differentiation by metallographic analysis is one of the methods available to determine whether a discharge is auto-electronic or not. This is an important remark because the undefined field of LENR came to resemble a waste dump - where everything was thrown in under the same abusive rubric; from the growth of protuberances in electrodes and lithium ion batteries, to claims of neutron production in fluid cavitation, to superconductors and plasmonics, interrupted vacuum-arcs, supersonics, etc. Genuine facts were lumped with factual errors and imaginary facts, all packaged with the promise of cheap LENR reactors that would deliver excess heat and save the planet from "climate change". Almost another decade has gone by since this DTRA report, and yet no LENR device materialized.

It was in this context "of aggravating failure and desperation" in the "LENR field" that Jaitner also issued his own plea in 2019 - along with his equally overambitious "analytical integration" of the fields of plasmoids, LENR, PAGD, plasmonics, etc, and his transmutationalist schemes. The case of the Safire Project shares the same context.

Begun in 2013, it was a project of M. Childs and D. Talbot - grandfathered by H. Puthoff and G. Hathaway (the "engineering masters") - carried by the Canadian company Aureon Energy Ltd. It, too, claimed 'to have put the sun into a ball' inside of an externally *pulsed*, double-cathode tube, where the cathodes are mechanically rotated and pressurized hydrogen forced to diffuse through a hollow spherical anode (as far as we can tell, only one of the many patents of Childs relates to Safire [24]). The reactor operates in the glow discharge before an arc is reached (notice: analogous to the PAGD region *that we first identified*). The plasma can also be fed and further constrained with lasers or masers. Because of the anode shape, the resulting glow discharge is spheroidal. But it does not form a free-floating plasma ball - not even like those D. Ritchie produced [25]. It is only superficially analogous to a "fireball" or "lightning ball". The documented plasma concentric segmentations of the anode glow clearly indicate sedimentation of charge polarizations ("space charges") that function as velocity filters, not altogether unlike faraday striations or spaces in an aurora discharge (10 to 300 mtorr). The 2019 project update claimed excess thermal power and evidence for transmutation of elements, though exactly which elements were found has never been revealed - not even whether they

confirmed Childs' many theoretical projections for the co-transmutations of diverse anode metals and ionized gases. Childs seemingly claimed COP values of over 5,000x (!) excess thermal power, and that the reactor worked with a wide variety of gases. Aureon's website still purports to have a commercial prototype for a plasma power generator ready for production and distribution for remote locations, to power data centers and military bases.

The web offers a few volunteer explanations as to how the Safire reactor operates. Some claim that it tested the basic fusion hypothesis of a motley school of thought called "The Electric Universe", since one of the early contributors to Safire was W. Thornhill, a main proponent of the "Electric Sun model". Even as Aetherometry shares many common features with some currents of "The Electric Universe", this is not the place to address the Electric Sun model, nor to explore the fact that the Voltage-Current diagram in figure 13 of Thornhill's 2011 paper (published by *The Open Astronomy Journal*) ignorantly replaces the PAGD regime by a "glow to arc transition". What concerns us here is the model's facile hypothesis that to generate hydrogen fusion products, it would suffice to inject a stream of high-energy electrons into a contained hydrogen plasma. As we have shown already, it doesn't. Further, as far as these authors know, there is no concrete evidence that the Childs ion-generator generated hydrogen fusion. Others have proposed that the Safire reactor sustained a self-ordering plasma that formed a macro version of K. Shoulders' "exotic vacuum objects" (EVOs; we should note that over the years Shoulders described his plasmoids with different terms, "electrum validum" or EVs, "high density charge objects" or "clusters", HDCOs or HDCCs, and EVOs...). There is this opinionated fellow - a guest of the LENR list that goes by the name of "Director" (see below) and poses as the ultimate insider - who set about to decipher the Safire Project on the basis that it was Puthoff's continuation of the work of Shoulders. But he goes on to describe the reactor as "a pulsed glow discharge" that operates in what he calls "the negative resistance regime" when "the plasma current ramps up". It now sounds not like Shoulders' patent but (somewhat) like the Correias' PAGD patents, to which the "Director" attributes no credit (more of the usual)!... This is all the more *abject an appropriation*, as our PAGD patents actually stand out for the simple fact that they present *copious experimental and analytical evidence* of the PAGD plasma phenomenon that we first discovered and meticulously documented, *not* Shoulders. There is no such evidence presented in the Shoulders' patent [26] which, though long, is rather devoid of experimental data and measurements! Of

course, we never claimed there was a plasma discharge regime when the resistance *was* negative - it is a silly fiction of the "Director" in the communion with the "Holy". The resistance precipitously drops or "goes negative", but remains a positive resistance in the pulsed abnormal glow discharge that "avoids lapsing" into a vacuum arc discharge, as well as in the latter. It is a misnomer to call it a "negative resistance region". The "Director" would know *that*, had he read carefully - even if only our patents. But the point is that the patented Childs' reactor is not a fusion reactor, but simply a pulsed hydrogen-plasma glow reactor that permits *proton-targeting* at the anode by high voltage electrons. Whether the glow is abnormal is difficult to say since, apparently, it is the positive column of the plasma that is saturated near the anode, not the cathodes that are glow-saturated. It is bound to generate heat at the anode by ion bombardment. If that heat is excessive, and a fortiori as excessive as Childs claimed, then, *in the absence of demonstrable deuterons, tritons and helions in the residual gas*, it can only be a manifestation of anomalous reaction forces directly at work within the anode glow plasmas. As far as we know, nothing practical or concrete has resulted from this claimed excess heat - but not for any apparent lack of funding. Like R. Mills' BLP (BlackLight Power Co), the project designed, built and bought state-of-the-art test and measurement devices that incorporated the best optics, electronics, cyber processing and AI machines available. They were rather extravagant engineering projects, instead of just projects in basic scientific research. It is always fun to have toys to play with... However, according to a September 2023 update, Aureon is now on to a new project with their Safire II and III reactors ("thorium-fueled power cell") - designed no longer to extract the claimed tremendous thermal powers for electricity generation (!), but instead to remediate radioactive waste (from injection wells, fracking water and radium in drinking water) using the "Safire elemental transmutation technology". It sounds to us like a fall from grace, all the more as it smacks of the work which S.W. Jin carried out in 1994-98 by exposing 227-thorium oxalate anodes to an electric spark discharge in the presence of deuteride gas. Jin claimed complete remediation of the neutron and gamma ray emissions from thorium down to ambient background levels. Yet, the mass spectroscopy was not systematic enough to make such a conclusion - since it compared the spectrum of thorium nitrate (admitting it would be similar to the oxalate) to the spectrum of the zirconium (target) electrode after processing, providing no control of the latter before processing. But with this was born the legend that EVOs -

composed this time of proton or deuteride plasmas - can mitigate natural radioactivity, whether neutronic or gamma [27]. It appears that the idea behind Safire II and III was a repetition of the work of Jin's team. So one is left with the quandary - what happened to the sun in a ball? Like LENR, it all morphed into an ultra-secret, incoherent and exotic knowledge of transmutationalism, where claims can be staked with the flimsiest of evidence.

It is amusing to see the wheel turn and turn over the same ground. In reality, it should not astonish anyone that the primary field of fusion investigation has been practically abandoned - since nuclear physics has failed to this day to properly understand (*analytically describe, energy-balance, charge-balance, isotope-balance, and chemically differentiate* - just as we provocatively did above in *that* "long" equation) the formation and fusions of deuterium and its immediate products. The delirium of the imagination had free rein with unchecked "transmutationalism" all the better as the reaction basics remained opaque and elusive. In a chaos of reactions, everything seems possible, and every shotgun approach must be taken. Only Aetherometry offers a sound way out of this self-perpetuating conundrum. Yet, it is seen as an enemy to be obfuscated and discarded. And seemingly, just because, capital-wise, the aetherometric project seems to be so easily outdone... Indeed, think BLP, or Safire, or MacB and the NRL, and so on.

We should not, in this survey, omit mention of Eric Lerner's research in the fusion of boron with a proton. We may have great sympathy for Lerner's views on the present-day stagnation of nuclear physics and astrophysics, despite his old-hat leftist political advice on how to change it; but his proposed reaction is also bogus - by aetherometric nuclear physics, it can be perfunctorily demonstrated that the desired isotope of beryllium (the intermediate) is not produced the way Lerner suggests, any more than his reaction leads to generate ^4He and the release of heat.

2. Energy in excess of breakeven in electrodynamic plasma reactors

2.1. Brief history of anomalous cathode reaction forces in plasmas

The reader should realize that the research work we will next address - the autogenously-pulsed plasma regime (PAGD, Pulsed Abnormal Glow Discharge) that we isolated, identified, studied and developed through a variety of inventions which resulted in several patents - began back in 1986. We demonstrated similar results with mechanically interrupted vacuum-arc discharges (IVADs). It became a subject of great controversy in the years 1996 to 2005, and the technology was investigated and our claims of energy in excess of breakeven confirmed by Dr. Eugene Mallove [28-34] and the retired RCA engineer Michael Carrell [35-36]. For years, under nondisclosure, we provided direct access of our laboratory to engineers of Ontario Hydro, which time and again confirmed our results; and gave untold numbers of demonstrations to interested companies, prospective sponsors, potential investors and colleagues - some of which, like the facetious G. Egely, falsely posed as representing potential investors in order to gain access to our lab (the list of such colleagues or others who approached us with deceptive designs is long and includes Hathaway and Puthoff, as well as an agent of the Canadian National Research Council, besides Minchrowski himself). Twice we were approached by *Blacklight Inc* representatives seeking our consultancy and help to solve the "technological problems" preventing confirmation of the breakeven claims made by the "hydrino technology" of R. Mills.

However, the history of plasma anomalies in "disruptive discharges" goes much further back than our own work. Anomalous cold-cathode reaction forces were first reported in vacuum arc discharges (VADs), in 1930, by Tanberg and Kobel, and immediately investigated by K. Compton. Tanberg designed an electrodynamic pendulum to measure them (which we reproduced and enhanced). During the 1950's, the US fusion program researched the utilization of anomalous reaction forces in exploding wires subject to high current surges and in 'axial pinch' voltage reactors, as potential neutron sources [37]. In 1965, Plyutto's Soviet team suggested an alternative model to Tanberg's vaporization hypothesis and Compton's model of rebounding gas ions hitting the cathode [38]: an *ambipolar* mechanism was responsible for these anomalous reaction forces, such that the emitted electron plasma swept the ions forward as a function of the anomalous rise of potential in front of the cathode spot (note that ambipolar here meant a

moving dual front of oppositely charged plasmas). By then, it had become apparent that the presence of tremendous electrodynamic forces acting longitudinally in the direction of the discharge could not be accounted for by the conventionally-accepted Lorentz/Bio-Savart law of electrodynamics. A unified and cogent understanding of diverse electrodynamic anomalies would not be forthcoming until Aspden published his seminal (albeit still mostly ignored) paper on a new law of electrodynamics [39-40]:

$$F = (qq'/r^3) [(v'.r)v - (m'/m)(v.r)v' - (v.v')r]$$

where m'/m is the ratio of positive ion mass to electron mass. On account of the mass ratio between electric particles of different q/m ratios, an "out-of-balance" electrodynamic force would necessarily arise to act along the discharge path. In 1977, Aspden filed a British patent application [41] that employed thermal conversion of the high anomalous acceleration of cathode-directed ions by electrons in VAD plasmas. In the intervening years, anomalous electron-ion energy transfer in plasmas heated by ion-acoustic turbulence or electron beams were steadily reported [42-45]. In the mid-1980's, P. Graneau and his group showed that electrodynamic explosions induced by kilovolt pulsed ion discharges in pure water were greater by three to four orders of magnitude than expected by established theory [46-47]. In 1988, G. Spence patented an energy conversion system [4] exploiting the charge-mass differential of electrons and ions in a magnetic separator and accelerator chamber having a basic analogy with Aspden's patent, but utilizing a different technique for the centripetal capture of the accelerated charge carriers.

2.2. Discovery and development of the PAGD plasma regime

Our own point of departure was a serendipitous observation - made while studying sustained X-ray production in parallel plate diodes - of quasi-regular discontinuities in glow discharges having a minimal positive column at very high vacua (10^{-5} to 10^{-7} Torr) and at low to medium voltages (10-50 kV DC). These events, which were associated with X-ray bursts, spontaneously originated localized cathode discharge jets that triggered the plasma glow in a fashion quite distinct from the photocathodic flashing of a cathode or from an externally-pulsed plasma glow, whether normal or abnormal. It would soon become apparent to us that these discontinuities were elicited by spontaneous auto-electronic emissions from the cathode under conditions of current saturation of the cathode glow, and could be triggered with much lower applied DC field strengths *in the*

absence of any X-ray production. The discharge was distinct from the VAD regime in that the plasma channel was self-extinguishing, presented a substantial negative change in resistance, the glow was abnormal (i.e. the cathode was current saturated) before collapse, and the regime pulsatory (see **Figure 1**). Thus, we termed the new plasma discharge regime - the autogenously pulsed abnormal glow discharge, or PAGD.

We measured strong anomalous reaction forces in the PAGD regime, while autoelectronic emission was observed at unexpectedly very low values of the applied field. Given the self-pulsed characteristics of the autogenous PAGD regime, the plasma tube effectively functioned as a DC inverter producing quasi regular large discontinuous current pulses that, once filtered from the associated DC signal, could be directly utilized to power and control AC induction motors, relays and transformer circuits. This culminated in the patented design of basic PAGD motor circuits referred to as the Labofex Motor Drive, the LMD™ [48]. Patent protection for reactor design and pulse generating circuitry was obtained [49-50]. Finally, through the coupling of a secondary circuit to the PAGD reactor, now made double-ported, we succeeded in capturing directly as electrical power the anomalous energy deployed by the ion discharge pulses at the cathode. This was the basis of the XS NRG™ (Excess Energy) Conversion System, a patent for which was also granted by the USPTO in 1995 [51]. The operation and physics of the PAGD were described in detail in our 1996 Denver lecture [52]. There, we presented results that conformed to the proportionality factor (F/i^2) predicted by Aspden's Law for the effect of the ion/electron mass differential of Al ions, thereby confirming its accuracy. At the time we reported these observations we concluded :

"By the Fowler-Nordheim paradigm, observation of auto-electronic emission under our experimental conditions would require theoretical field-enhancement factors on the order of $>10^6$. Suppression of these tremendous fields as a function of defined physical factors, can only be ascribed to an energy input from the "vacuum" field, akin to that which supports the consistency of lightning balls (...). Aspden has suggested that the aPAGD regime relies on "vacuum spin" for its energy storage function."

At low applied fields ($<<10^6$ V/m), the currents obtained exceeded those predicted by quantum field emission theories by 2 to more than 4 orders of magnitude.

Aspden himself published an extensive analysis of our PAGD technology [53], along with countless other articles and mentions made in many of his journal papers and books (for ex. [54-63]). Even though our own analytical framework (Aetherometry) has

come to substantially differ from Aspden's system of Aether Science in many critical parameters, the PAGD and IVAD regimes confirmed Aspden's Law and further indicated that there was a fundamental validity to his notion that the ultimate source of the anomaly was a "vacuum reaction" sustained by "Aether spin" in the gap of the discharge. The high-resolution metallographic analysis we had conducted [23] permitted definition of the cathodic auto-electronic signature: it formed discrete, vortex-like craters due to the action of the 'tornadic' structure of the cathode ball and its interaction with the overlying plasma discharge channel. The vortex structure of the channel was suggestive of Aspden's theory of Aether Spin.

With the aetherometric project under way, we returned to an analysis of the PAGD regime on occasion of presenting our 2002 Berlin lecture [64]. In this communication, we applied for the first time the tools of Aetherometry to our work on plasma physics. We suggested that the pulsed ion-acoustic mechanism of the discharge would absorb some "latent" (meaning, phenomenologically 'nonelectric') component of the Aether that was converted into the emission of ambipolar Aether radiation. In effect, the radio signature(s) of the latter was something that we regularly demonstrated during operation of the PAGD reactors. Aetherometrically, the "Aether Spin" which constitutes the rotation of "the quon lattice" in Aspden's theory, became regarded as a rotating tubular envelope of directional, synchronous and parallel ambipolons released from "the vacuum state" near the cathode surface, whose energy and potential could be controlled by changing critical reactor parameters.

As we discovered, the "vacuum reaction" in question was not exclusive to the PAGD or IVAD plasma regimes. There appeared to be Aether energy contributions to both normal and abnormal glow discharges, that were not present in Townsend avalanches or proportional discharge regimes. This fact became glaringly apparent once one took into account the aetherometric analysis of *how blackbody photons are produced* from the whittling down of the electrokinetic energy of electrons and more massive monopolar charges. The question of immediate interest was: how are blackbody photons produced by the plasma interaction such that their creation occurs with lower and lower breakdown and sustaining potentials as we pump down the reactor until, near the Paschen minimum, they reach the lowest levels known in glow discharges for nearly two centuries? Or phrased slightly differently - how can increasing the negative pressure of the vacuum down to the

Paschen minimum present us with production of blackbody photons whose frequency increases (and thus their energy) while the applied potentials decrease?

The question directly concerned the colour temperature of the glow discharge but, more profoundly, the anomalous acceleration of the electron plasma in pulsed plasma discharges - essentially what conventional plasma physics holds is the outcome of the scatter-up of electrons by elastic collisions (EC) with gas molecules. The process whereby randomizing electron velocities yielded velocities exceeding the initial value was once known as the "Langmuir Paradox". In other words, it is as if the electrons are accelerated by a much stronger field in the glow discharge than the one that was applied. Von Engel, as quoted and underlined by Aspden [53], critically observes: "(...) the space potential is considerably higher than the discharge voltage and at least higher than the lowest excitation potential" [65].

The problem might be glossed over in the normal regime of the glow discharge (NGD), where the values for the current density j are not anomalous. Yet, even there, the mere production of both visible light LFOT (low frequency optothermal) photons and HFOT photons [66] already raises the question of a contribution from the "vacuum-state" to the plasma interaction. But when it concerns interrupted vacuum arc-discharges or the auto-electronic pulsation of a current-saturated, abnormal glow discharge, this intervention can no longer be ignored, because the values of j are highly anomalous in these regimes (for details see [23]). This was already known to the excellent team of vacuum-arc researchers which GE supported up until 1980 - with A. Greenwood pointing out that the anomalously high currents found in cathode spots and "the lack of analysis of the nonequilibrium state of the plasma ball" [67] could not be addressed adequately or explained by the magnetohydrodynamic equations.

2.3. Application of Aetherometry to the PAGD/IVAD plasma research

After our study of the operation of Tesla coils (see the first paper of the present series [68]) we became convinced that the Aether in a vacuum gap behaves like the combined inductive and capacitive coupling of a Tesla secondary. Determinations which we carried out with air in a gap of 1 cm, with 1 cm² plates, showed that, whereas at 1 atmosphere the electric field frequency ($\epsilon_{MBe} = 5 \cdot 10^{14} \text{ sec}^{-1}$) of the electron plasma at breakdown is sufficient to produce blackbody photons in the visible yellow portion of the

electromagnetic spectrum, the electric field frequency of the breakdown voltage of air at the Paschen minimum (air Pd = 0.4 mm Hg*cm) can only produce blackbody photons in the range of 4,000 GHz. Since much, much higher frequency LFOT and HFOT photons are observed in the glow discharge at the Paschen minimum (and even at 1 atmosphere, in a breakdown corona), we had to reject the traditional view of the glow discharge and to replace it with the notion that the plasma interaction contains an intermediate state that involves variable contributions from the "vacuum medium". The frequency of the photons produced by the electron plasma in the discharge channel indicated that a high kinetic energy had been imparted to the electrons, per

$$E_{Ke} = p_e W_v = \alpha^{-2} h\nu$$

where W_v stood for the aetherometric electric wave of coulomb potential. Since we have now shown [69] that the greater is the frequency of the blackbody photons, the greater is the observed electromagnetic heat that is released, the voltage of the plasma electrons can be directly expressed in quantum mechanical terms and by reference to Boltzman's constant as

$$W_v = \alpha^{-2} h\nu/p_e = \alpha^{-2} kT/p_e$$

This led, of course, to our discovery of a quantum-based function for temperature, that can best be summarized [69] by

$$T = h\nu/k = \lambda_o c^2/k = (p_e W_v/\alpha^{-2})/k = p_e W_{\text{photon}}/k$$

where λ_o is the path length of the photon energy, and W_{photon} the photon's electric potential -

$$\begin{aligned} W_{\text{photon}} &= h\nu/[p_e (69,065.20829 \text{ m sec}^{-1} \text{ volt}^{-1})] = \\ &= kT/[p_e (69,065.20829 \text{ m sec}^{-1} \text{ volt}^{-1})] \end{aligned}$$

The photon's electric potential is, of course, numerically equal to its energy expressed in electron-volts. Aside from the excess electric energy captured by the charge pack of the converter, there was substantial heat being released by the cathode. With a particular reactor design that directly employed the cathode as the hot-plate of a Stirling engine, we could run the latter at high speed while the PAGD regime was on, and for periods of 30 minutes or more after the reactor was shut down (which we documented in videos that can be found at aetherometry.com).

The anomalously high kinetic energy of the electron plasma in the PAGD channel clearly indicated that some field was accelerating it beyond the applied potential. It

suggested that the "vacuum medium" reacts to the polarization of the reactor gap by converting some of the energy of its "local vacuum lattice" into ambipolar radiation which, in turn, accelerates the electron plasma [64]. The very fact that such Paschen vacua produce the entire breadth of optothermal photons as well as a variety of metastables in the heavy ion plasma, is nature's way of signalling this contribution.

Aetherometric research has identified the frequency limit ν_k of blackbody photons as the frequency of the Hartree photon energy [70-74]

$$E_H = h\nu_k = m_e c^2/\alpha^2 = 26.606 \text{ eV}$$

It constitutes the limit beyond which photons of any greater frequency are necessarily ionizing and no longer part of the blackbody spectrum. Plasma physics has long ago discovered (for ex. [75]) that ionization in a plasma discharge releases photon energies of magnitude W_i that are ultimately contributed by the kinetic energy of incident electrons. The latter acquire this energy by elastic collisions that, far from the initial conditions of the discharge, reach the energy values required to produce both excited and ionized states of the molecules of residual gas when the electrons inelastically collide with them. For noble gases, these energies all lie significantly lower than the $h\nu_k$ limit, such that $\Delta E = E_H - W_i$ is always positive. Thus, the contribution from the "vacuum state" permits (1) acquisition of ionization energy W_i from the "vacuum" field with low applied fields, and (2) ionization to occur below the Hartree limit for the outermost valence electrons of practically every atom. These considerations led to our extensive aetherometric model of the electron plasma interactions, presented at length in our 2002 Berlin lecture and accompanying paper. Briefly, if the kinetic energy of the electrons is

$$E_{Ke} < (\alpha^2 h\nu_k/6.4)$$

the elastically acquired energy in the intermediate state of the discharge is shed in the form of LFOT photons; if it exceeds that condition, it is inelastically transferred to excited or ionized gas molecules, with HFOT photons being eventually emitted as the spectral markers. If the kinetic energy reaches the value of $(\alpha^2 W_i)$, ionized states result which subsequently emit the characteristic ionization spectra of still more energetic HFOT photons with energy corresponding to W_i . Given a constant gap and at the Paschen minimum, the plasma electrons will be accelerated by the emission of ambipolar energy from the "vacuum medium", the variation being a function of the strength of the electric field or, as in electron accelerators, a function of the injected field energy [76]. In PAGD

or IVAD reactors operating with low applied potentials at the Paschen minimum (for ex. 600 VDC breakdown potential and ~350 VDC of sustaining potential for a 4 cm gap), the electron plasma in the discharge channel generates blue-light HFOT photons ($v = 6.6 \times 10^{14} \text{ sec}^{-1}$). This requires, by AToS, development of a field potential of:

$$W_v = p_e v / W_k = \lambda_e v = 3.66 \times 10^9 \text{ m sec}^{-1} = 53 \text{ kV}$$

where W_k is the aetherometrically-identified magnetic field-wave characteristic of the electron mass-energy, and λ_e its mass-equivalent wavelength. This means that the plasma electrons will be ambipolarly accelerated in the vacuum gap to speeds given by

$$v = \sqrt{(W_v W_k)} = 9.645 \times 10^7 \text{ m sec}^{-1}$$

or ~20 times greater than the initial electron plasma velocity (typically $4.9 \times 10^6 \text{ m sec}^{-1}$) predicated on the sustaining voltage. There is therefore, far from the initial conditions, an unmistakable contribution of energy from the "vacuum state" if we solely consider the field strength of the plasma interaction and the lumination which corresponds to it. The aetherometric explanation can then be condensed as follows: the "vacuum medium" acts as a secondary by creating an ambipolar radiation field which drives that blue HFOT photon production by non-collisional shedding of the kinetic energy the electron plasma gained from the field.

2.4. Recent work on the PAGD regime at the *ABR Institute*.

Over the years, lack of investment in our many detailed business proposals and budgets to develop the PAGD/IVAD technologies actually freed our time to allow us to conduct (2004 to 2009) further research on the physics of PAGD/IVAD plasmas, concentrating on the automation of the converter system. Initial tests back in 1998 with insulated gate bipolar transistor (IGBT)-based switchers resulted in consistent destruction of the IGBTs, even when these were rated for much greater peak-pulsed amperages than those we could measure oscilloscopically or with a data-acquisition system. Later, after 2003, we replaced the IGBT circuits with a reversible system of self-actuating relays, which failed to register capture of the excess energy. This appeared to be inevitable, given the large energy losses incurred by the atmospheric arcing of the relays that, it too, soon enough destroyed relays located just downstream from the reactor cathode(s).

Back in 1994-1995, when Ontario Hydro physicists and engineers had been unable to actually measure, with their instruments, the power input and output of the PAGD

reactors in our laboratory - something they painfully acknowledged (we do have some amusing stories of their efforts, which we documented in videos and memos) - we were willing, with our own means and generous gifts from dear friends, to satisfy their demands for a still more exact determination of the excess energy phenomenon than the one afforded by the use of battery packs. First, we documented it with a data acquisition system. And, subsequently, we carried out a series of experiments that repeatedly reversed the roles of the drive and charge packs - what we called the manual "Ping-Pong Converter" experiments [77]. These demonstrated that it was possible to energize a receiving charge pack and use it in reverse to re-energize the drive pack, and by such repeated interchanges, increasingly capture energy in excess of the initial input in both packs.

However, by 2005, always weary of possible artifacts, we conducted control experiments utilizing sequential resistive discharges of the aging charge and drive packs, and found that the employed lead acid gel banks presented artifactual anomalies that cast doubt on those ping-pong results: there was a measurable voltage-memory effect, and an increasing tilting of the voltage, energy and power curves over time - upwardly during the initial process of resistive discharge and downwardly at the tail end. If a resistive discharge was repeatedly interrupted (with short or longer durations), greater and greater potentials and discharge currents could be obtained at initiation if the 6Ah cells were discharged near 6A. The effect intensified if the cells were loaded or unloaded with interrupted resistive discharges at greater peak currents or, instead, with peak overvolting.

Worse still, over time it became apparent that under the action of the PAGD or IVAD, cells located in the middle of the series-wired charge pack were charged the fastest and the most, whereas cells located at the ends of the series became stably overvolted (up to >50 VDC), presented increased resistance, low charge density and eventually failed altogether. This was evidence of the inability of the gel cells to capture the very large peak currents of the PAGD or IVAD regimes (problem of the charge pack). It was also evidence of their inability to sustain deep peak discharges (problem of the drive pack).

These findings stumped us for a few years - we came to doubt whether the 4x to 10x COPs we had determined using resistive measurements of the power gained and lost by each pack after a PAGD run were reliable. The problem was compounded by the fact that exhaustive measurements with faster and more accurate oscilloscopes also

demonstrated that to analyze in real time and simultaneously the huge peak currents generated by the PAGD, the resolution of very small currents still flowing from the drive pack between pulses was low, making these currents even more diminutive. They appeared to be leakage currents flowing into the DC filter tanks, since there was no low intensity glow present in the reactor. Over time, at very low pulse frequencies, they seemed to consume sufficient power to nullify the excess. In varied set-ups, we extensively measured and isolated simultaneous drive pack direct currents and reactor peak current outputs. At very low pulse frequencies, it appeared possible to conclude that no excess energy was actually registered.

Science is science - hopes can be dashed and findings be falsified by artifacts - so we had to accept it. There the matter rested for a while, until we took up these experiments anew in the years of 2012-2015 - detailed in 3 manuscripts that have remained unpublished. We will now succinctly detail some of this work for the first time.

First off, we were able to uniformly stabilize the discharge so as to systematically investigate much faster and PAGD rates (75 to 1,000 PPS) with lower pulse amperages. We focused the investigation at 75 PPS (integrations at rates higher than 100 PPS required more laborious measurements and computations), which virtually eliminated the problems posed by the inter-pulse current leakage from the drive pack of the converter. This time, we were able to employ *direct resistive measurements of the reactor output* with a new product - a calibrated 400W, thick film, 1% precision, cryogenically-controlled and temperature-stabilized, 0.1 ohm resistor. We conducted an exhaustive waveform analysis (simultaneous capture, time-lapse photography and continuous video documentation) and integration performed down to the 0.1 microsecond level with battery-powered (ungrounded) 100 MHz analog/digital oscilloscopes. Under these conditions - after we blew through in succession, at the reactor outputs, identical resistors but sequentially rated for 100W, 200W and 300W - we were able to *systematically measure output electric powers that exceeded by more than 4-fold* (e.g. 0.32 kW rms, with a vacuum contribution of 0.246 kW) *the DC power input* (e.g. 74 watts). In various tests with changing control parameters, we measured COPs ranging from 3 to as high as >4.

We were equally able to determine what percentage of the output power resulted in the optothermal production of photons, both HFOT and LFOT, and at which quantum frequencies they occurred. As we had shown before, the resulting heat could be

extracted to drive a Stirling motor, and the optical component could also be captured by surrounding the reactor glass envelope with photovoltaic cells (inside the metal-shielded reactor assembly). Resonantly-tuned secondary coils connected to the metallic shield of the PAGD reactor could capture residual ambipolons that had not been absorbed by the discharge channel and had made it through the glass envelope, and other coils placed at distances of up to 10 m from the reactor could capture the "radio" and microwave signals indirectly generated by some of the emitted ambipolons that managed to pass through both the glass envelope and the metal shield of the reactor assembly.

The discharge process had two major tempos, a high-voltage acceleration of the emitted electrons by ambipolar radiation from the "vacuum medium", followed by current amplification processes made at the cost of ejecting the cathode material (surprisingly, in the form of Al^{2+} ions) and the reduction of the potential of the plasma electrons hitting the anode. We also confirmed that the observed velocities of the aluminum atoms vaporized from the cathode by the PAGD regime were anomalous - i.e. much greater than the vapor speeds expected from the enthalpy of vaporization.

In our 2002 Berlin lecture [64], we had already suggested that the contribution from the "vacuum medium" that was expressed by the emission of high-voltage ambipolons might be seated in "latent" or "phenomenologically nonelectric" local components of that medium:

"It is entirely possible that the critical, primary mark of the field contributed by the 'vacuum medium' consists of a standing pressure wave that is not electromagnetic in origin."

At the time, we had not yet developed our electrodynamic theory of thermodynamics enough to realize that barometric pressure is entirely an electromagnetic phenomenon, and the indirect electrodynamic result of synchronous *ambipolar standing waves* being present in any volume of matter (to be demonstrated in the upcoming Ch. 7 of AToS Vol. VI). But in 2015, with this realization in hand, we came to finally understand how these standing waves are tapped electrically and magnetically by the spinning clusters of cathode surface electrons to release the high-voltage ambipolons responsible for the anomalous cathode reaction forces and the energy in excess of breakeven.

The exacting nature of all these findings, by then unexpected, only emphasized in our minds the *extreme importance* of including *basic* scientific research *in* any serious

technological project of *applied* research and development. Not a single potential investor, corporate or otherwise, that we encountered over nearly 4 decades (not even the generous Davidi Gilo!), ever understood this necessity (yet, Gilo offered to invest \$US107 million in all of our technologies - in medical biology, tissue culture, chemistry and physics, with \$10 million going to a basic research institute). Had we abandoned the primary research component of our work, we would likely have been mired in another failed energy technology project. Our 2012-2015 findings also brought back into focus the technological *necessity* of employing better battery cells capable of absorbing the peak PAGD currents, in the construction of the drive and charge packs of the XS NRG converter (see the section on battery systems in the preceding paper of the present series). We have been intent on publishing these reports in the context of our still undisclosed AToS volume on electrodynamics and its aetherometric law. For many reasons, we have been wary of completing this promise. But for now, the above serves as a summary of the methods and findings of our recent investigations into the physics of the operation of PAGD reactors.

2.5. How the Correa PAGD reactor became

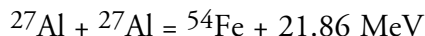
"the most wonderful LENR reactor" ever invented!

What follows must be one of the most amusing and twisted episodes in the history of excess energy physics. After all the malignant mischief which Rothwell caused to the Correias (whom he accused of suffering, like Tesla and Reich in his mind, from a paranoid "Inventors' Disease") and to Mallove, the whole affair of the PAGD and "Cold Fusion" came back to bite him in a most ironic fashion, albeit in a totally erroneous way - it, too, ironic! For, it was "seeing" transmutations everywhere which recently (in 2019) led Jaitner to not only lump our PAGD plasma work into a general physics of "condensed plasmoids" but - lo and behold! - with the advice and guidance ("kind and competent support") of Hagelstein, magically transform our PAGD reactor into the most wonderful LENR reactor [16]:

"The author is thankful to Paulo and Alexandra Correa for having invented, built, analyzed, patented and documented the most wonderful LENR reactor."

How could we be so disdainful as to reject such heartfelt sympathy and admiration? But no amount of either one changes the facts of science, or the PAGD

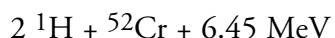
plasma reaction for that matter. In effect, Jaitner claims that the excess energy likely stems from the ongoing nuclear fusion, at the cathode, of aluminum-aluminum atoms, which he provides as the coulomb-tunneling reaction (his #9 reaction):



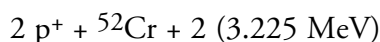
He further speculates this may lead to the production of chromium:



which he writes without any charge balancing - since



is poor short-form for



Either way, we would have failed to detect the nuclear transmutation that would be ongoing in our PAGD reactors (now his compliments look *gauche*) - and the likely source of the observed excess energy.

We saw above what the context was for Jaitner's claim - how a ubiquitous LENR replaced "cold fusion" and came to swallow all sorts of diverse research fields under the same *ad hoc* umbrella. Even as the US Navy was getting out of the LENR business, everybody else was jumping in. But this claim of Jaitner's regarding the PAGD reactor bears some analysis, because it is a *prime example of the rampant errors* committed by "LENR researchers" in their promotion of a generalized chaos of nuclear "transmutationalism". They verily believe (*ad volitio*) that the chaos excuses them from actually having to know which nuclear reactions can and cannot proceed.

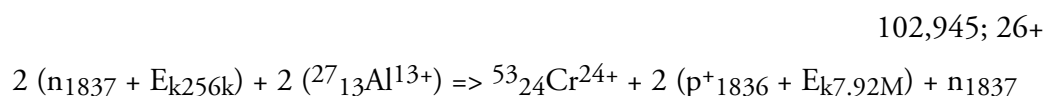
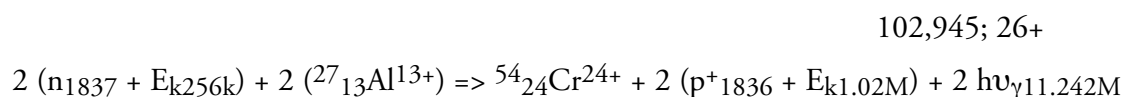
Let us assume that the first reaction (aluminum to iron) suggested by Jaitner occurs - how would the excess energy have been captured *electrically* if what would have to have carried those 21.86 MeV of energy would undoubtedly have been a gamma ray? One can not just simply claim that such energy was released, instead, as heat... With cathode vaporization rates on the order of 10^{16} Al atoms per pulse, it would have melted the cathode and pyrex. Small problem indeed.

Assuming the first reaction would be possible, it would actually have to generate two gamma rays of 11.242 MeV, for a combined energy of 22.48 MeV - slightly greater than Jaitner's calculation. But such a reaction cannot simply proceed as written by Jaitner. In effect, ^{27}Al is a stable nuclide with a natural abundance of practically 100%. Jaitner's Al-Al fusion is most poignantly missing a defined and required input. In PAGD

experiments with a COP>4, we registered modal vacuum contributions to the electron plasma on the order of 117.06 keV. But this is just not enough to drive such an aluminum fusion reaction, which is not spontaneous. Nor would Al-Al fusion be able to preserve the same neutron:proton ratio in the reagents and product.

If these facts were not enough to prove Jaitner's reaction (and contention) erroneous, there stand two more facts. *Primo*, that we never observed (or claimed) excess heat, but excess *electric energy*. *Secundo*, that plenty of our tests of the PAGD reactor (under low applied field inputs) made with unshielded and shielded X-ray *and gamma-ray tube detectors* of different sensitivities (up to >27 MeV) registered no such ionizing radiations. *Nada*. Jaitner should further note that we most often used highest purity hard aluminum electrodes. When these were removed from disassembled reactors, they presented no ferromagnetic effects or iron oxide deposits. Moreover, in a variety of tests, *only ambipolar radiation* at 40 keV to a maximum of ~330 keV could be demonstrated - while the electrons in the collected and greatly magnified arc current proper rarely reached 400 eV.

Now, as an exercise in actual nuclear physics that will further elucidate the arbitrariness of Jaitner's reactions, let us consider the full Al-Al fusion reaction, which incidentally does not pass through an iron-54 intermediary, nor ends up at Cr-52 (83.76% natural abundance), but at Cr-54 (2.38% n.a.) or at Cr-53 (9.55% n.a.), with the latter likely more frequent than the former since it has a very high thermal neutron absorption cross-section (larger by >47x than Cr-54). The two reactions *require the input of two neutrons*, which may have a lower limit kinetic energy of 256 keV each; written aetherometrically, the reactions are:



Jaitner's gratuitous assimilation of the PAGD to aluminum fusion, then, is another prime example of the transmutationalist disease (recall above Jin et al's work with thorium

remediation in the testing of Shoulders' EVOs made up of deuterides). In his paper, Jaitner lists a whole series of what he considers are established nuclear transmutations. It is worth looking it up, and verifying whether, by aetherometric nuclear physics, any of them would be viable. Think how unlikely that is, when D-D fusion is so poorly understood by hot and cold fusioners and LENR transmutationalists alike!

Though Jaitner does not hesitate to call our PAGD reactor a LENR reactor, he has enough dignity to venture that the PAGD energy in excess of breakeven may *not* come from his proposed fusion of aluminum. He ventures that (p. 35):

"There are two alternative explanations, how the PAGD device could generate electrical energy:

1. Via nuclear energy feedback, the current of each of the discharge pulses is continuing to flow in the initial direction after the external capacitor has been discharged and the electrode voltage has reversed its polarity. During this phase the discharge channel has a negative resistance and is generating electric energy. This phase will end, when the CPs are losing [sic] contact to [sic, i.e. with] the electrodes. To repeat the effect, the polarity of the electrode voltage has to be reversed again by the next externally supplied electrical pulse and so on.

2. Alternatively (or maybe additionally), the output of electrical energy of a PAGD device is stemming [sic] from fast electrons emitted by CPs at the cathode surface. Some of these electrons are reaching the anode and are causing a reversal of the potential between anode and cathode. In this reverse mode a current (and energy) can be extracted from the PAGD device as long as the CPs at the cathode are emitting electrons. After a while a new electric input pulse (in the original polarity) is required for keeping the CPs emitting electrons."

Notice the emphasis that Jaitner places in both explanations on the necessary alternate reversal of reactor polarities. Yet, none of this is the case. Each PAGD pulse has sequential positive and negative phases, but they occur without reversals in electrode polarity. The sustaining potential does not invert; there is no negative resistance regime or channel. It is the plasma potential that oscillates according to the dominant roles, in time, of the distinct electron and ion plasmas (formed mostly by aluminum). Note also that it is bad form to suggest that energy is generated. Despite all the sheer idiocies which Shoulders has written on nonconservation and so-called energy production [78], energy is neither destroyed nor created, it can only be converted, transformed, whether by triggered extraction or passive capture.

By 2018-2019, Jaitner's report had ignited some controversy among the LENRs - with the same fellow as above, the "Director", writing various posts in the LENR forum

that suddenly placed the Correas' PAGD reactor as one of the main paradigms of energy in excess of breakeven, while one administrator type named Alan Smith did his rothwellian best to demean it and even undercut our reputation (a latecomer to that show). Some "JohnO" blurted "I'm reading Correa's [sic] stuff. My mind is blown", prompting the Director this time to address "Correa's mistakes", quoting chapter and verse from Egely, and always stressing how the Correas had merely re-hashed A. Chernetskyi's tube... In effect, this Egely fellow - who invented a supposed biodetector *that, after we tested it, led us to conclude that he himself did not understand how it functions*, and who visited our plasma lab and observed the PAGD under NDA but with false pretenses - put forth his thesis of "plasma polaritrons" (or "pseudo-particles" as he also calls them) back in 2013, in the now defunct *Infinite Energy* [79]. In it, he claims that:

"This author has ten years of full time experience with both [Chernetskyi's and the Correas'] setups, extensive know-how and bitter disappointment with both approaches. The most important and neglected feature of both effects has been the formation of very sharp tapered needles of nearly perfectly cylindrical symmetry on the cathodes."

As anybody who read our original metallographic communication knows, there is no initiation role for needle-points on the PAGD cathode, nor any evidence for the formation of needle protrusions by the discharge. The cathode craters formed by the large electron currents leave behind tiny molten spheroids, not needle protrusions. In many other experiments we had already studied the role of needle-point cathodes in initiating electric discharges, whether in electrostatic or electrodynamic (PAGD) processes. They are useless for the latter, since they are essentially single-shot cathodes, as vacuum-arc physics well knows from the study of the role of microprotrusions at initiation [80]! In the collective effort to assimilate the PAGD to Shoulders' theory and patent for an energy conversion device [26], Egely mistakes the former for the latter. In effect, one can read in Shoulders' patent that "prevailing factors preclude the use of pure field emitters of large size" (sic) in his invention; he continues - "the critical limit appears to be one micrometer (...) For cathodes above such size, the stored energy of the associated circuitry places an undue thermal strain on the small emitter area during emission" (p. 50 of [26]). This is just what we *avoided* by using *large area cathodes* (the largest ever employed, that we know of). In the late 1980's, we investigated the role of cathode protuberances or microprotrusions in the PAGD regime. To rule it out we built reactors with protrusion-free, highly-polished

Alzak aluminum electrodes that yielded much greater rates of pulsation than obtained with heavy aluminum under comparable settings. This can even be found in one of our patents - besides in our metallographic report [23]! Furthermore, Egely entirely misses the point of the large plate area effect that we reported - which is what further reduces the potential near the Paschen minimum and shows it does not simply depend on the Pd (pressure*distance) parameter. And sometimes Egely simply lies:

"Tens of thousands of initial pulses are needed for the large area Correa cathodes (usually 64 cm²)."

Perhaps he just confused the electron bombardment required to clean (degassing) a PAGD tube before final processing and vacuum-sealing, *with* its operation as a PAGD reactor, once sealed. There is no such conditioning necessity in the latter. As to his own dead-end street, he built a "fakir-table" cathode, the perfect labyrinthic nightmare:

"When the author tried an artificial grid of needles (spaced 0.5 - 1 mm apart with molybdenum needles, sharp blades, stainless steel mesh and brush), the bursts appeared immediately, but at lower voltage and current amplitudes. Higher current impulses quickly melted them. This technical nightmare of surface quality control made the author abandon the project, apart from personnel and financial difficulties."

It is incredible - both the bad-conscience of Egely and that the post-Mallove *Infinite Energy* published such falsifying trash. Consider another Egely extract on what the Correas supposedly "missed":

"Both Chernetsky and the Correas missed the importance of acoustic resonance. The excess energy released from a number of sharp metal tips, due to the apparent surface plasmon resonance, charge shielding and consequent fusion phenomena, was not efficiently coupled to the plasma. Consequently, the electric circuits extracting power did not work efficiently, though both of them desperately fought with this problem. The Correas even missed the importance of hydrogen as a fuel, though they (and we) noted that removing most of the water from the gas tube walls by baking them out reduces the extent of the effect, or ceases altogether."

What role acoustic resonance played in the PAGD, Egely is not telling us. It is only in his mind that the excess energy is released from "sharp metal tips". We never fought desperately with such a nonexistent problem - fruit of Egely's closed self-ideation. Nor were we interested in studying the role of hydrogen gas - since the mass ratio of protons to electrons is much smaller than that of aluminum or the residual argon (thus, by Aspden's law of electrodynamics, will increase the reaction force), and given that our interest at the time was *not* in hydrogen fusion, but in the auto-electronic emission mechanism. And just

what evidence does Egely provide for the pretended role of cathode protuberances in the PAGD? He answers glibly, and once again without any evidence whatsoever:

"The Correias tried small surface wire cathodes as well, with a higher electric field density, but in vain. The correlation between excess energy due to the cathode surface (needles), hydrogen gas and transient plasma discharges were beyond doubt. Certainly D2 gas should have been looked at, but the lack of clear, reliable test results has prevented it."

It is rather wild to read imaginary tales such as those spun by Egely. The "wires" we tried were tungsten electrodes that functioned as anodes, *not cathodes*! Caramba! And the correlation which he totally fabricates (rather like ChatGPT [81]) - between surface needles and excess energy - is nonexistent, having never been provided by us or himself, for that matter. Anyway, this is the guy who the "Director" and others rely upon to describe the "invention" of the Correias (which, rather disrespectfully, they nearly always use in the singular as a person to be hated). Here is the "Director" on December 1st, 2018:

"According to Egely who claims to have attempted to replicate the device with a group of ten other researchers, the problem was that the tiny protrusions would eventually erode away and the excess power would go away."

Now, while this childish circus was going on in the LENR forum, there was also a thread that read: "Team Google wants your opinion: What is the highest priority experiment the LENR community wants to see conducted?" Ha! As if these LENR techno-barbarians knew! All along, this was just a collective excitement about getting monies from Google and Gates. Eventually the good old Rothwell bulldog got uncorked: in response to a nonsequitur quote from the "Director" ("I'm hoping that someone who is familiar with the work of Paulo Correa..."), Rothwell blurted one of his complete falsities:

"I am familiar with that. It is the worst calorimetry I have ever seen, and I've seen loads of atrocious calorimetry. I pointed out some of the problems and Correa went ape shit. For months! I think you can find his attacks against me with Google. The guy has a screw loose." (December 1st, 2018)

This was priceless, since there is no calorimetry ever employed in the original study of the PAGD! Talk about a few screws missing. Seemingly, he shortly thereafter realized the imbecility of his comment and, like ChatGPT [81], found nothing better to do than double down:

"I used the word "calorimetry" because I use it all the time. What I meant was: the energy balance. The method of measuring input and output power. It was atrocious. It proved nothing. If you deliberately set out to

make the worst demonstration you could come up with, that would be Correa . He made Rossi look reasonable. I don't recall many details but one test that comes to mind -- like a recurring nightmare from eating too much lasagna -- was a gadget tied in with a PV device and placed in bright intermittent sunlight in a way that made it impossible to determine which was producing how much power. It was insane. It was on the level of an orgone box, which is basically energy from plywood. I seem to recall that Correa was an orgone enthusiast but perhaps I am mistakenly ascribing nutty beliefs to a nutty person." (December 1st, 2018)

Here is the paragon of LENR and the veritable *alma mater* of the LENR forum, whom cold-fusioneers have been sheepishly following and tolerating for over two decades. The word "calorimetry" was just his jerkish reflex, never mind that. But our well documented and exacting measurements of input and output voltage, current and power, peak and rms - *that* was...atrocious. Then he recalls a test that only his lasagna indigestion could have dreamt of, a test that is nowhere to be found, while in passing insulting Reich (it always works for the meek of mind) and carefully elevating just one of us to the category of "nutty person". His malignant intent is only too transparent. Next follows the "Director", opining from the pulpit of self-satisfied ignorance: "I think one of Correa 's [sic] failures is that he reached to [sic] far with his overall aether theory." Here is another topic that the "Director" literally knows nothing about. But by December 1st, 2019, the "Director" had one better:

"The Correa 's [sic] only used noble gases in their systems because they did not buy the idea for a moment they might be producing nuclear reactions of any kind. But when their system was deeply degassed, removing any trace amounts of water vapor that could have seeped in, before being filled with argon, the excess energy either diminished or vanished."

Clearly, this is how the "Director" transliterates the Egely crap - but no!, dear sir!, the excess energy *did not disappear* when the outgassed PAGD tubes were filled with residual argon or air, and sealed. It all depends on the final pressure at sealing. At 10^{-7} torr one would be far from the Paschen minimum for a PAGD discharge whose breakdown voltage was 150V/cm. With potentials of 50kV, not even X-rays would be produced. But at 10^{-3} to 10^{-4} torr, PAGD discharges could easily be sustained with field strengths as low as 20V/cm. It's that simple, moron. Puffed-up pontificators - that is all there is and ever was in the LENR forum and the moribund second decade of *Infinite Energy*.

All of this clownery was as preciously rich as the failure of Google's effort to create a LENR table-top fusion reactor that "only reached" some 18 million degrees kelvin [82] ...

and yet generated no excess heat, no excess thermal power! Even though, the ongoing publication of our own work in thermodynamics has already proven the fundamental errors currently make by thermometric measurements - we may assume that, in the best of cases, such "researchers" mistake the electrodynamic effects of anomalous cathode reaction forces for nuclear fusion - which they think can be simply achieved with some sort of a plasma diode configuration and hydrogen gas, like Bakhoun claimed for his apparatus [83] or the more sophisticated Safire reactor (but that, too...). In the worst cases - which is the majority - they have nothing, save false and thoroughly falsified science.

The reader should appreciate how the current failure of energy science and technology is not just due to the lack of vision and commitment on the part of potential investors. Yes, they do throw money around, like Google or the NRL, etc, to hyped and "hyperbolic" projects that invariably fail, if nothing else, because the *basic* science is missing. But the failure we speak of is much greater than this - it is also due to the veritable pululation of vile characters such as these LENR types - that have been allowed to usurp the scientific discourse and debase genuine scientific research, whether at the center or at the peripheries of science. They know little but are not ashamed to parade it. It is here that the great cancer or malignancy originates in science. They regularly opine on subject matter they have not read or researched, let alone grasped. And they think they know what they want - here is the "Director" again speaking for the entire forum: after quoting from one of our patents he states -

"So you see, we want to operate in the extreme slope immediately before a true arc discharge is established. The difference between Correa 's [sic] device and what we want to achieve is that we don't want to pulse the device to create transient plasma phenomena. We want to achieve the negative resistance regime with an OPTIMIZED FUEL MIXTURE and then tune it into resonance so that the plasma ball will detach from the electrode and become free floating." (Nov 30th 2019)

However, after having had our good laugh, there is one point where we can fully agree with Jaitner's theory of condensed plasmoids: the role that pinched channel plasmas (PAGD and IVAD included) and their cathode-spot balls may have in the electrodynamic containment of nuclear fusion - both as drivers of the energy injection, and as controllers of the fusion reaction. Any serious design of a nonthermonuclear D-D fusion reactor would have to take into account both the electrodynamic of the regime of plasma

discharge, and the electrodynamics and electrochemistry of the fusion reaction and its products. That we know of, no one in the field has reached even half this far.

3. Other devices that claim COP>unity.

3.1. The Motionless Electromagnetic Generator

In 1982, J. Bedini, who later became an associate of T. Bearden, claimed to have invented a "negative-resistor process" (the "Bedini effect") that he applied to have a motor run from a battery for 3 years, and at the same time charge the battery from "the back emf". He later claimed to have reproduced the E. Gray tube-driven motor, and registered COPs >> 1 from its operation. We have less trouble with the latter claim than with the former (which eventually was the subject of a patent application filed by Bedini and Bearden), but be that as it may, Bearden and his associates subsequently filed two other patent applications in 1997 and 2000, a patent being granted in 2002 [84] for their invention of a Motionless Electromagnetic Generator that was "based on the Bedini effect", and could generate energy in excess of breakeven. Bedini eventually grew sour with the whole affair, as controversy built up around "who invented what".

On the basis of the Bohren effect (that a particle's target area varies with the nature of the incident energy excitation [6]), Bearden regarded the MEG as an interceptor and concentrator of local electromagnetic energy [85]. He argued that a squared wave signal applied at specific frequencies to two primary coils - placed head-to-head and wound around the same continuous core containing a transversely placed permanent magnet (PM) - can induce the core to produce and sequester a large magnetic flux, and thereby generate in the secondary collector coils (placed parallel to the PM) very "large electric fields" by "the coherent addition of energy".

Bearden claimed the MEG yielded COPs greater than unity, and even as high as 2 with the more advanced second version. In figures 18 and 19 of a joint paper [86], Bearden et al provided digital oscillographic data for the voltage, current and rms power of the MEG input and output, with a COP of 1.33. From those figures, it is obvious that the MEG functions like a secondary that amplifies or magnifies the voltage of the primary - that being accomplished at the cost of the decrease in current, as in any other induction coil.

Despite Aspden's arguments that power could be obtained from magnetism [87] - and despite even his successful preliminary experiments with extraction of electric energy from his magnetic reluctance motors - we always had some reticence in accepting at face value the overunity operation of the MEG. To explain the MEG's operation, Bearden and his coworkers heavily relied on too many hypothetical paradigms that are devoid of experimental basis and yet essential for their analyses and the data processing of their findings. Chief among them was the original contention that magnetic monopoles (dear to Bedini) exist and play a critical role in the operation of the MEG, a contention which was later abandoned in favour of a deemed "negentropy mechanism" that could "withdraw energy" from the "magnetic vector potential" of the magnetic dipole. It sounded, and sounds, to us like a lot of gibberish - all the more as we now know that there are no such processes as thermal or electric negentropy, and that the "magnetic vector potential" is not some form of energy or tank of energy, but simply a component of every electric (massbound or massfree) form of energy. This, irrespective of the fact that not much can be technologically accomplished with COPs of 1.3, or even 2.

3.2. Pais' piezoelectric superconductor

In November 2019, Pais obtained a fast-tracked patent [88] for a piezoelectric-induced high-temperature superconductor. The first thrust of the patent was to eliminate the energy losses from *wired* electric transmission of power - the losses that, though lower than those incurred by the Edison electric system, still remain in the Tesla AC systems. In effect, Pais invents a new kind of transmission wire, with coaxially inverted conductor and dielectric. As he claims in the patent, in order to attain room-temperature superconductivity, the transmitted current must be pulsed while being piezo-electrically vibrated at resonant frequencies. His concept "enables the transmission of electrical power without losses, and exhibits (...) no heat dissipation, which leads to the design and development of novel energy generation and harvesting devices" (paragraph 3, p. 1 of [88]). Lossless transmission of power is in essence a COP=1 condition for the emitter/receiver couple. Though Pais categorically states in the patent what the device does in the present tense, he provides zero experimental data for any concrete embodiment - and none has so far become known.

Based on O. Heaviside's interpretation of maxwellian electrodynamics, Pais claims the discovery of the 'Pais effect' - in his words, a synthesis of "the Meissner effect [i.e. perfect diamagnetism], the Cooper effect (or bipolaron formation) and [what he calls] the Prigogine effect" (para 24, p. 3 of [88]) - that explains how the pulsed transmission of electric power is made superconductive by the constructive interference of intermittent abrupt vibrations transverse to the transmission vectors. In a 2015 paper [89], Pais examined how Prigogine's dissipative structures could explain the "spontaneous" cohering of random fluctuations into orderly states or systems. He narrowed the requisite conditions to "the existence of a highly non-linear medium, an abrupt departure far-from-thermodynamic-equilibrium, and an energy flux (...) to maintain the process of self-organization" (para 27, p. 3 of [88]). The Meissner effect would ensure that the maximum density of the magnetic field flux due to self-induction was reached.

In a 2022 *youtube* interview with C. Jaimungal on his channel aptly entitled "*Theories of Everything*", Pais described in far less clear terms the effect that he claims to have discovered - as the possibility of controlling the intermittently pulsed motion of charges or plasmas by subjecting them to "accelerated vibrations or accelerated spin" created by "rapid acceleration transients". When he mentions resonance, he equates it to "an amplification of energy"... The Pais' effect would be the key to tapping the energy contribution from the local "vacuum medium" - the rationale applying to his fusion reactor, where the orderly counter-spinning of the electromagnetic fields would serve as containment of the fusion reaction. Similarly, the inertia-reduction device that he patented [90] would use the effect to break down 'the quantum vacuum'. The device would become displaced through successive neighbouring "voids in the vacuum". He writes: "the void 'sucks in' the craft". Though analysis of claims to such craft is well beyond the present communication, it suffices to note that Pais' argument is entirely a speculative one, based upon an illegitimate and erroneous equation (his Equation 4).

Most provocatively, Pais' claim that Cooper pairs could play a role in "high temperature" superconductivity is strikingly parallel and in some ways similar to our own aetherometric concept and experimental discovery of *room-temperature* electron plasmas, in the form of a bioplasma or the terrestrial geoplasma: in 2012 [74], we had shown how a bilaminar structure could be formed with back-to-back or front-to-front electron dyads (forget about the Casimir force, another Puthoff farce); subsequent biophysical research

indicated that these dyads can, even under STP conditions, form series, like chiral chains of electrons, that move on metal and dielectric surfaces and may be stored within the materials [91]. We directly measured both the potential of the direct currents associated with the lateral displacement of bilaminar plasmas, and the pulsed electric potential of the kinetic energy of each dyad electron [91-92]. We even succeeded in measuring the ambipolar emissions that source the kinetic energy of the human bioplasma. Poignantly, though, our bilaminar plasma dyads are not really melded "Cooper pairs" (condensed matter) - rather, they are composed of ordinary free electrons!

However, even if the ingredients which Prigogine and Pais say are required to form self-ordering systems or plasmas be granted, still a mere breakeven (COP=1) condition in the operation of a reactor or a superconductor must require something more that has been left out: indeed, the "coherence of random fluctuations" that sources self-ordering - is not simply the result of an abrupt change in the system caused by a "catastrophic" surge of energy that is made to recycle. If that were the case, there would be multiple such discoveries and processes already in existence, not just a multitude of false and erroneous claims. Rather, formulated in such a manner, that idea is just the discourse that underlies the complex probabilistic and stochastic theory of "unexpected" singularities. It misses the critical crux: what exactly is it that directs, and how, self-coherent energy processes, whether in stellar fusion, the emergence of living systems, or electrodynamic plasma reactions?

To answer such a question, one has to understand how massbound charges interact with underlying massfree fields of electric energy such that ordered systems (such as plasmas) can be formed. Further, this interaction goes both ways - since we have shown how electron clusters can be induced to synchronously tumble their aligned magnetic-field waves transversely to their planes, and in this manner collectively and cooperatively release their joint electrokinetic energy in the form of massfree (electric) ambipolons, rather than by the quasi-local production of photons (and their fascicles). Prigogine, Pais and virtually all physicists are convinced that the energy of the "space-medium", or "vacuum state" is electromagnetic (just as Maxwell was convinced that his Aether was electromagnetic). But, irrespective of ionizing electromagnetic radiation (X-ray and gamma photons), the radiative energy that must concern us here is not photonic or electromagnetic, but electric and, just as fundamentally, massfree. It will not be by violent injections of lased photons

and electron plasmas that ordered fusion reactions will be triggered in proton or deuterium targets. Coherence of a plasma - e.g. in a transmission beam or in a pulsed plasma - depends on the spatially-consistent repetition and controlled energy pulsing of those cooperative magnetic tumblings, so that the resulting ambipolar emission is coherent and capable of orderly generating the electric field that underlies as much the coalescence of plasma reactions as the directed transmission of power ambipolons [91]. The order is not just any order that comes with the cards, but the immanent order of an energy resonance - manifest as much by electron capture of the modal energy of an ambipolar field, as by cooperative electron emissions that convert their electrokinetic energy back into directed ambipolons.

For one familiar with the requisite fields of physics, the Pais patents appear to be not the result of research in basic physics, but speculative shots in the dark with complex purposes. They form an attempt to integrate and explain some of the features of what seemingly are disparate objects of investigation - room-temperature superconductors induced by piezoelectric vibrations, rotary plasma-compression fusion reactors, inertia-cancelling motional devices, "gravitational-wave generators" using "resonant acoustic vibrations". But they fall short of each objective by what are, in effect, the shortcomings of the conventional physics and its reductive framing of allowable alternatives. Things do not exactly work as Pais claims. Thus the matter takes on a very different aspect, as it gives the appearance and allure that, whatever the science and technology might be behind "UFOs" or attributable to extraterrestrial intelligence, and so on (Fortean included), it is something that the U.S. Navy pursued in its research labs and the U.S. government already possesses. In reality, nothing seems further from the truth, as our own work in Aetherometry exquisitely and extensively demonstrates. No government in the world has any such knowledge, let alone holds the bodies of humanoids and their crashed craft... No intelligent fellows cruise the galaxy just to have their complex electrogravitic craft come crashing down on the earthly graveyard of human exotic aircraft. In our view, even today, no military has the means to shoot down any such electrogravitic craft. It is just a tall tale to cover up "exotic" military research. What else could it be, when conventional and alternative physics are so perplexed before genuine cosmic machines, and so perplexing as to the coherence of their own theories?

The reductionism and ablations are everywhere apparent in the scientific discourse - confusion of massbound and massfree electric charges; of photons with ambipolons; of mass-energy with kinetic energy; conflation of gravitational energy with electromagnetic energy, of inert mass with gravitational 'mass', of electromagnetic and electrokinetic heats, of ion-acoustic processes with the electromagnetic fields they generate. Equally abundant are the dogmas in evidence - that fusion can only be thermonuclear; photons must have mass; "spacetime" travel can be done across voids or through wormholes; the universe was born with the Big Bang and will die by heat; and so on. The litany of these dogmas underpins the character-structure of the conventional physicists and scientists, and thereby the limitations of their thought-processes or how they think. The consequences are dire, since physics is the progenitor of all other sciences. Some think that physicists are, or were, led to these abstrusities because of the complexities and implications of mathematical physics. Nothing could be further from the facts; it was the analytical inability of mathematical physics to undo these conceptual and pseudo-functional abstrusities of physical theory which permitted their *pro bono* proliferation, resulting in the subordination of mathematical physics to probabilistic computation models, and their unnecessary complexification.

3.3. Whatever happened to Shoulders' plasmoids, EVs, HDCCs or EVOs & etc?

In many ways, Shoulders and his illustrious career - along with his allies, Puthoff, McKubre, etc - did a lot of harm to fundamental research in energy science and technology. He mixed up cocktail upon cocktail of confused notions. One may start by questioning the very concept of what exactly are high charge density plasmas: do the field emission devices he invented launch his claimed EVOs - or whatever he cares to call electron, proton, deuteron, etc, plasmas - or do they simply replicate the production of Bostick's plasmoids [93]? Indeed, Bostick showed back in the 1950's that electron plasmas present orderly structures - and so do proton plasmas and any other ion plasmas. These structures can be stabilized toroidal helices, barred spirals and whirl-rings, as Bostick showed, or sphericized, as Ritchie showed, or form quasi-spheroidal cathode spots, as VAD and PAGD research showed, which dissipate as spiraloids and striated cylindrical channels. Except for the striae, all these plasmas were always thought of as being clusters of the *same* charges, whether electrons, protons, deuterons, etc. Their density varies according

with the method of production, barometric pressure and the magnitude of the electric currents involved. But for hype's sake all these other names had to be invented - from Shoulders epithets to Egely's pseudoparticles, polaritrons, plasmons and Jaitner's condensed plasmoids, etc. That specious part aside, Shoulders spouted all sorts of idiocies on the conservation and "production" of energy. Energy conservation somehow did not apply to high density plasmas - whose "density" some computation from the idiot J. Sarfatti placed on the order of Avogadro's number (a meaningless proposition if no timeline or space reference is provided, such as number of charges per second, etc; an Avogadro number of charges per second is equivalent to ca. 6,900 amperes). Shoulders claimed that his EVO electron plasmas exhibited non-conservation of mass and charge, and that the reduction in both was at the root of "so-called cold fusion energy gain" [78]. Somehow, "EVO association" could "reduce the mass of nuclei" and release thermal energy. No real need to understand anything concretely.

Shoulders never gave experimental proof that any of his needle-point launchers or reactors generated excess heat. In fact, that we recall, he never gave hard data for any of his inventions, patents and statements. He cautioned against "the dark side of electron ensembles", claiming his EVOs could "destroy any known object bit-by-bit". And though he never once demonstrated how an inexhaustible source of energy could be tapped, he disjointedly stated that "the real difficulty [?] with this method of destruction is that the [EVO] gun does not need to be reloaded as its energy comes from the virtually inexhaustible source that drives all electron ensembles as EVO energy generators" [78]. It is one more Tesla-rehash, hollywood fairy tale.

Somehow, Shoulders regarded his EVOs as something even more ubiquitous than mere high-density plasmas. Shortly after Shoulders' obit in 2023, W. (Bill) Zebuhr waxed poetic on these EVOs which "seem to offer a way of connecting to the most fundamental and universal element of existence, sometimes called the aether. Ken refers to this as the Potentum, a name given by Joe Firmage" [94]. That should probably have been enough to turn anyone off. Not just mention of Firmage, but more to the point, this all-serving Potentum which Shoulders never identified as to exactly how it works, and how it relates to the formation of electron clusters or ordered electron plasmas. It's mystical. Just as the US Navy pivoted from LENR (2011) to the Pais technology, here was this supremely deceiving fellow, Zebuhr - whom we once got to know rather well before he betrayed us,

the Mallove family, and the memory and intent of Eugene Mallove for *Infinite Energy* and the New Energy Foundation - claiming the EVOs as "foundation for any overunity device" (no less...), as the source of extreme temperatures in "sonofusion" and the basis for ball lightning; plus, "understanding charged clusters better may clarify some of Tesla's work". It seems, he just forgot to haul LENR transmutationalism onto the EVO bandwagon.

Be that as it may, Shoulders left behind no working device that extracted energy in excess of breakeven from some natural process - and never proved he had invented one. Zebuhr argued this was solely a matter of lack of interested investment - and then went on to a most amusing economic analysis: he lends to an invention such as Shoulders' conversion system a value of \$1billion "when developed", and applies a 'realistic time scale' of 20 years to reverse-calculate that "it is now [at the start] worth only \$5.2 million discounted at 30%, and \$1.2 million discounted at 40%". He concludes the obvious - that this value (its present worth) is simply not enough to implement the development of what he calls "the idea", and the inventor "will not have enough money to complete the work". We thought we taught him just that in 2004 in our long visits - that this kind of arbitrary and greedy (penny-pinching) thinking guides investors in new energy technologies (we used to talk of the \$1million barrier, as if it was good for anything). Two decades later, it is even worse - only short-term speculation grows capital, and when the gains are taken what is left is good for nothing. Basic research in energy science and technology has become good for speculators and looters. Zebuhr himself presided over one of these many debacles - he, too, had his own personal objectives in gaining control of *Infinite Energy*, as he had invented a giant waste processor cum water purification in which one of the many Rockefeller grandchildren was investing. But irrespective, there was something that Zebuhr left out - that in the age of digital Ponzi schemes, crypto and AI, money is always made if it comes in fast with the latest fad and goes out faster still, before the fad dies. By the same inflationary token, there would be no basic research left in the academia, and all grants would fizzle to worthlessness. Thus, all scientists, institutional or not, must now, more than ever, promise worlds and depths in order to survive or rather, mendicate. A curious trait of our epoch is how this degradation of science and falsification of physics came to coexist with the wokenist devastation and desire to castrate, above all, science and knowledge itself. It has been a long way down, but there is more to go.

4. Some conclusions - A word to the wise

We may well have wished to have been the recipient of that half-million dollars the US Navy spent investigating the ideas of Pais, or better, of the probable billions spent by its research facilities and centers in search of LENR and feasible LENR reactors for well over twenty years. We were never that lucky - or subservient to military interests. In effect, our own interaction with the US Navy told a very different story: it wanted our PAGD work to be offered on a platter under *its own* nondisclosure agreement! That way, it could always argue to us that it already possessed the same technology we did, and we would have to be mum about it. As for our own protection - not even peanuts: a simple refusal to sign our own NDA.

The pleasant fellow who approached us, John Shelburne (Mechanical Engineer at Coastal Systems Station, NSWC - DD), wanted us to provide a dog-and-pony show by taking the XS NRG system (! battery packs included!) to Washington for a demonstration, at *our own cost* - rather than have the Navy technical experts visit our lab. The 1996 correspondence is found in **Appendix 1**, which includes our final response. Little did we know that the U.S. Navy would continue to support LENR research of the type conducted by SRI Int, for another 15 years. Around that time, we found on the web the document of **Appendix 2**, where Shelburne stated he made a presentation to the Pentagon Office, to "the Joint Chiefs J-6 for C4I on ultra-high technology electromagnetic applications in 1996". He delivered a list of recommended scientists and their technologies, where our dear friend Harold figures in second place, and one of us in third (no quibbling possible, of course, with the well-established Puthoff in first). Interesting enough, looking back nearly 30 years, Harold and Paulo were the only ones that never received funding either from the Navy/Pentagon, or from other substantial corporate quarters, like Mills or Childs did. Shelburne's second and third recommendations certainly fell on deaf ears. But, curiously, none of the other listed technologies yielded to this day a single, verifiable bench-top demonstrator (a working prototype), let alone a commercial prototype. Mills' BlackLight Power (BLP) announced on May 2008 that it had a 50 kW commercial prototype, and one deluded G. Vesperman claimed in 2010 that BLP had licensed 8.25 GW of power to seven utilities - but it all fizzled out, along with Mills' erroneous interpretation of quantum mechanics. BLP then changed its name to Brilliant

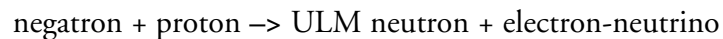
Light Power Inc... A brilliant move indeed. If Mills did not rake a few billions in investment over two decades, he must have come close.

Let us now look, on fast forward, to what happened more recently (Pais aside). In 2018, the U.S. Naval Research Laboratory (NRL) announced that its Plasma Physics Division would henceforth be working with MacAulay-Brown Inc (MacB), a company that had just been bought by Alion (founded in 2002 as employee-owned, to provide technical intelligence, advanced engineering and R&D services, including in cyber and data analytics, to the DoD). The stated purpose of the effort was that "MacB scientists, engineers, and technicians will perform on-site experimental and theoretical research in *pulsed power physics and engineering, plasma physics*, intense laser and charged particle-beam physics, *advanced radiation production*, and transport. Additional work will include electromagnetic-launcher technology, *the physics of low-energy nuclear reactions and advanced energetics*, production of high-power microwave sources, and *the development of new techniques to diagnose and advance those experiments*" [95] (the italics are ours). It sounds like the kind of stuff that the "civilian" Labofex and ABRI have done and continued to do for 4 decades now: pulsed plasma power technologies (PAGD, IVAD); research in advanced massfree radiation (neither "nuclear", nor ionizing or electromagnetic, but *ambipolar*); the (aetherometric) physics of actual fusion reactions; new techniques of physical analysis and measurement (the Aetheroscope, which we have unceasingly developed with new techniques of computation)... In sum - the very stuff we have been discussing in the present report and persistently doing all of our research lives!

What became of all of these grand plans of the NRL and MacB? In 2022, Huntington Ingalls Industries (HII, America's largest military shipbuilding company that amongst many other services, offers artificial intelligence, cybersecurity and electronic warfare) bought Alion from Veritas Capital for \$1.65 billion. Supposedly, the MacB mission continued. Yet, what has come of it which does not fall under military secret or just simple technical intelligence of little interest? Did it just lay the famous UAP eggs? In the same timeframe of the Biden Administration, it was the turn of the Department of Energy's ARPA-E (Advanced Research Projects Agency - Energy) to return to the LENR business, announcing in February 17, 2023, a \$10 million programme allocated to 7 *institutional* recipients and one private company (Amphionic). One of them, the Lawrence (Berkeley) National Laboratory, received \$1.5 million to investigate whether LENR can

occur at 500 eV or below on targeted metal hydrides loaded with deuterium. Most of the selected project applications focused on deuteration of electrodes.

The fact is one has to wonder about the validity of the very concept of LENRs. Krivit's 2013 review of the field [96] starts off with a glaring inconsistency. While he claims the various LENR processes "lack prompt radiation and high-neutron flux", he then states: "Types of prompt radiation detected include X-rays, gamma rays, energetic particles and neutrons. All of these radiations are emitted at low intensities so they are difficult to measure in LENR experiments." Yet, the DTRA report concluded to the involvement of "energetic neutrons". Then Krivit goes on to apply the WL theory to LENR. But right on the theory's second step we encounter the *confabulated* reaction that invokes neutrino production:



No such reaction exists. Neutrinos do not exist, and no neutron is formed by the effective fusion of a single negatron with a proton. We have shown this elsewhere [3], and have already mentioned Krivit's excessive reliance on Einstein's note to Sternglass [17]. When combined with the lack of reproducibility of most LENR methods that he reviewed, we are forced to conclude that most, if not all, of the claims to LENRs and LENR devices are false. The very delimitation of the LENR field is likely erroneous. So, back to real basics...

The reader may legitimately wonder how so many promising energy technologies - based on thermonuclear fusion, LENR, sonofusion, plasmonics, emission of charge clusters, hydrino production, etc - on which so much capital was lavished by so many - from the NRL to NASA, from "angel billionaires" to Google - have never seen the light of day when it comes to their potential for commercial embodiments of power generators. It is vexing. Moreover, most of the claimants to "excess heat production" have benefitted in the past 3 decades from the Great Alarm of the GW/Climate Change hoaxes [97]. Everybody was out to save humanity, and every braindead project deserved some red cents (for a decade, Egely paid ten other workers, in vain, to wrongly replicate the PAGD... simply fantastic!). Unfortunately, even creative scientists have only too often posed as saviours of humanity or mankind - a dual false concept that has had terrible consequences. There is no such thing as mankind or humanity per se, so there is literally nothing to save or not to save. But under this dual guise there have always been ambitions to drastically alter the common lot of very different peoples - ambitions which, intent aside, seem to invariably turn into nightmares (like present-day AI). The nightmares of

power-Potestas, or what one may pun as Nightmares. One of these is the long-standing notion of weather modification - once an almost benign notion, as in N. Tesla's dreams to modify and control the ionosphere by imparting electric power to it akin to the effects of solar radiation (it could turn night into day...), or in W. Reich's dreams of creating or destroying clouds with his water-grounded "cloudbuster". The innocent or ineffective nature of these dreams made them innocuous. However, once the myth of a CO₂-driven GW became enshrined as the new religion of politics and the anchor of a "global market of carbon credits", we entered into a nightmarish age of a socially-promoted technological aggression of the atmosphere - of "the sun we get and the air we breathe" - with the Gates Foundation at the forefront of the multi-institutional attack. "Weather modification" was immediately seized as a new weapon of warfare by intelligence systems - a key method of social and biological engineering. Another nightmarish example of braindead research is the recent Caltech project to use solar panels mounted on board low-altitude satellites to capture solar radiation and convert the resulting electric energy into a maser emission directed down to the Earth [98]. Obviously the technology is somewhat feasible, even if no receiver efficiency was reported (another small detail) - but that is not its fundamental problem, an evident one: if the power beam were to successfully be made coherent and directed, the atmosphere and all birds and aircraft in its path would be fried. Imagine a forest of such beams raining down on the Earth's surface. The hype is all that matters.

The social and economic consequences of three decades of the GW myth have been devastating to science, and physics in particular. But we are now entering an age when, hopefully, it will at last be totally defunded and thrown overboard. Thus, the messianic age of investing in alternative energy science and technology in order to save the planet is also coming to an end. The long-term lesson is simply that *basic* scientific research should always be its own end or *telus*, without political, religious or military interference or tutelages. Any scientific project in forefront applied physics cannot succeed without a strong foundational component of basic research. No amount of volitionism can replace good science, solve technical and material problems, and generate viable technologies. Science, *but only by the grace of science, of its method* - and at the service of Life and the living. No more, no less. Practice this, and science can go far in a spirit of discovery and adventure that may promote peace between the peoples of the Earth. Avoid it, as the case has been, and every conceivable social mess will come *your* way.

References

1. Acton-Taylor L (2024) "Nuclear waste to be dumped into waters off Cape Cod and could turn ocean radioactive for a month", Dailymail.com, December 11.
2. Correa PN & Correa AN (2025) "Critical appraisal of XXIst century energy science and technology (2): causes of the failure of the electric vehicle (EV) and basics of the autonomous electric vehicle (AEV)", *J Aetherom Res*, 4, 2:1-25.
3. Correa PN & Correa AN (2023) "The Evolutions of Stars and the Secrets of Nuclear Fusion", Volume VII of *Aetherometric Theory of Synchronicity (AToS)*, Akronos Publishing, Concord, ON, Canada, ABRI monograph AS3-VII.10.
4. Spence GM (1988) "Energy Conversion System", USPTO Pat# 4,772,816
5. Aspden H (1996) "Vacuum Spin as a new energy source", *Proc. 3rd Int. Symp. New Energy*, 1996, Denver, Colorado, pp. 1-19.
6. Bohren CF (1983) "How can a particle absorb more than the light incident on it?", *Am J Phys*, 51,4:323.
7. Bearden TE (2002) "Energy from the vacuum: concepts and principles", Cheniere Press, Santa Barbara, CA, pp. 595-596.
8. Correa PN & Correa AN (2025) "Electron fine structure and flux topogeometry: Aetherometric vs. Zitter models", soon to be published.
9. Collins S (2025) "China's 'artificial sun' shatters nuclear fusion record by generating steady loop of plasma for 1,000 seconds", *Eurasia Business News*, January 26.
10. Allen V (2025) "Nuclear fusion breakthrough: 'artificial Sun' reactors sets a new world record by generating a steady loop of plasma for 1,337 seconds - taking the world closer towards limitless clean energy", Dailymail.com, February 19.
11. Correa PN & Correa AN (2005) "The 'Correa solution' to the 'Cold Fusion' enigma: the 2004 DOE Report on the submitted Cold Fusion Review, and the generation of heat on Table-top Fusion Reactors", *J Aetherom Res*, 1, 3:1.
12. Correa PN & Correa AN (2023) "Sunspots and the internal structure of the Sun - a little lesson in nuclear physics and photochemistry", Volume VII of the *Aetherometric Theory of Synchronicity (AToS)*, Akronos Publishing, Concord, Canada, ABRI monograph AS3-VII.5.

13. Iwamura Y, Sakano M & Itoh T (2002) "Elemental analysis of Pd complexes: effect of D2 gas permeation", *Jpn J Appl Phys*, 41:4642-4648.

14. Pais S (2019) "Plasma compression fusion device", USPTO patent No. 2019/0295733A1.

15. Cohen A (2021) "What is behind the U.S. Navy's 'UFO' fusion energy patent?", *Forbes Magazine*, updated at forbes.com on December 10.

16. Jaitner L (2019) "The physics of condensed plasmoids (CPs) and low-energy nuclear reactions (LENR)", at: www.condensed-plasmoids.com

17. Ravnitzky M (2018) "This is not 'Cold Fusion' ", *Proceedings Mag*, September, 144, 9:1387. **For the source on Einstein's note, see Krivit SB (2023) "Albert Einstein intuited method of creating neutrons decades before LENRs were described" at newenergytimes.com. Krivit makes much of Einstein's note and calculation that a potential of 780 kV would be needed. Einstein's term - "passing through [so many] volts" - indicates it refers to the empirical applied voltage but, as conventionally assumed, it is indistinctly taken to be the voltage of the kinetic energy acquired by the electrons (as in - "electrons of such high voltage", in the same note). Yet, our own work [76] has solidly demonstrated that the coulomb potential of field-accelerated electrons *does not* exceed 511 kV, and is, beyond a threshold, at all times in exact disproportion to the applied potential.**

18. Mosier-Boss PA, Forsley L & McDaniel P (2016) "DTRA: Investigations of nano-nuclear reactions in condensed matter final report", Technical Report from Defense Threat Reduction Agency, June.

19. Krivit SB & Ravnitz MJ (2016) "It's not cold fusion ...but it's something", *Sci Am*, guest blog, December 2.

20. Hioki T et al (2013) "Inductively-coupled plasma mass spectrometry study on the increase in the amount of Pr atoms for Cs-ion-implanted Pd/CaO multilayer complex with deuterium permeation" *Jap J Appl Phys*, 52:107301-1 to 8.

21. Takahashi A (1994) "Some considerations of multibody fusion in metal deuterides", *Fus Technol*, 26:451.

22. Roussetski AS (2000) "Application of CR-39 plastic track detector for detection of DD and DT-reaction products in Cold Fusion experiments", in 8th Int. Conf. on Cold Fusion, Italian Physical Society, Bologna, Italy.

23. Correa, P & Correa, A (1993) "Metallographic & excess energy density studies of LGEN™ cathodes subject to a PAGD regime in vacuum", Labofex Scientific Report Series, S1-007. Also published in *Infinite Energy*, 17:73, 1997-1998, and by Akronos Publishing as monograph LS1-07.

24. Childs MW (2019) "Ion generator apparatus", USPTO pat#10,398,015B2, August 27.

25. Ritchie JD (1963) "Ball lightning in nature and in the laboratory", *J of IEE*, 9:202.

26. Shoulders KR (1991) "Energy conversion using high charge density", USPTO Pat. #5,018,180.

27. Yurth D (2007) "Remediation of radioactive emissions in spent nuclear fuels using high density charge cluster (EVO) techniques", in blog/hasselberger.com/docs

28. Mallove E (1996) "Cheap Electricity Now!", *Infinite Energy*, 7:3-4.

29. Mallove E (1996) "The Third International Symposium on New Energy - ISNE3, Denver, Colorado April 25-28, 1996", *Infinite Energy*, 7:14-16.

30. Mallove E (2001) "First Open Letter of Support", June 14th, 2001, Akronos Publishing, Concord, ON, Canada.

31. Mallove E (2002) "Demonstrating Aether Energy", *J Aetherom Res*, 2(6):26-31 (first published as a "Breaking Through" editorial in *Infinite Energy*, 41:6).

32. Mallove E (2002) "Second Open Letter of Support", February 22nd, 2002, Akronos Publishing, Concord, ON, Canada.

33. Mallove E (2002) "The Correases: An Appreciation of Their Science and Technology", Akronos Publishing, Concord, ON, Canada.

34. Mallove E (2004, published 2008) "Introduction to the Correases' Video From Pulsed Plasma Power to the Aether Motor", *J Aetherom Res*, 2(4):1-5.

35. Carrell M (1996) "An Overview of the Correa Invention", *Infinite Energy*, 8(3):10-15.

36. Carrell M (1996) "The Correa PAGD Reactor: errata and supplement", *Infinite Energy*, 9(4):33-34.

37. Bishop AS (1958) "Project Sherwood - the US Program in controlled fusion", Addison-Wesley Publishing Co., Mass.

38. Plyutto AA et al (1965) "High speed plasma streams in vacuum arcs", *Sov Phys J Exp Theor Phys*, 20:328.
39. Aspden H (1969) "The Law of Electrodynamics", *J Franklin Inst*, 287:179.
40. Aspden H (1985) "A new perspective on the Law of Electrodynamics", *Phys Lett*, 111A:22.
41. Aspden H (1978) "Ion accelerators and energy transfer processes", UK pat.# 2,002,953.
42. Morrow DL et al (1971) "Concentration and guidance of intense relativistic electron beams", *Appl Phys Lett*, 19:441.
43. Porkolab M et al (1973) "Parametric instabilities and anomalous absorption and heating in magnetoplasmas", *Int. Congress on Waves and Instabilities in Plasmas*, Inst. Theoret. Phys., Innsbruck, Austria.
44. Sethian JD et al (1978) "Anomalous electron-ion energy transfer in a relativistic-electron-beam-heated plasma", *Phys Rev Lett*, 40:451.
45. Tanaka, M & Kawai, Y (1979) "Electron heating by ion accoustic turbulence in plasmas", *J Phys Soc Jpn*, 47:294.
46. Graneau P & Graneau N (1985) "Electrodynamic explosions in liquids", *Appl Phys Lett*, 46:468.
47. Azevedo R et al (1986) "Powerful water-plasma explosions", *Phys Lett A*, 117:101.
48. Correa PN & Correa AN (1995) "Electromechanical transduction of plasma pulses", USPTO Pat.# 5,416,391.
49. Correa PN & Correa AN (1994) "Pulse generator", WIPO, WO94/0391.
50. Correa PN & Correa AN (1996) "Direct current energized pulse generator utilizing autogenous cyclical pulsed abnormal glow discharge", Mar. 26, USPTO, Pat.#5,502,354.
51. Correa PN & Correa AN (1995) "Energy conversion system", USPTO Pat.# 5,449,989.
52. Correa PN & Correa AN (1996) "Excess energy (XS NRG) conversion system utilizing autogenous pulsed abnormal glow discharge (aPAGD)", *Proc. 3rd Int. Symp. New Energy*, 1996, Denver, Colorado, pp. 43-62. Also at:
aetherometry.com/publications/direct/ISNE3.pdf

53. Aspden H (1996) "Power from Space: the Correa Invention", Energy Science Report No. 8, Sabberton Publications, Southampton, England. Originally written for IAI, Israel Aircraft Industries.

54. Aspden H (1995) "Energy from a cold-cathode discharge: a 30-year saga", NEN, 12:6.

55. Aspden H (1996) "Free-Energy" as seen on British TV", NEN, 2:10.

56. Aspden H (1996) "Space energy blows NASA's fuse", NEN, 3:1.

57. Aspden H (1996) "Aether science papers", Sabberton Publications, Southampton, England.

58. Aspden H (1996) "The contemporary Aether", Proc.s Int. Conf. on Descartes and Scientific Thought, Perugia, Italy, September 4-7.

59. Aspden H (1996) "The reality of Perpetual Motion", Infinite Energy, 8:15.

60. Aspden H (2002) "Our future energy source - the vacuum!", Lecture No. 27 for the 2002 Berlin meeting, at haroldaspden.org/lectures/27.htm

61. Aspden H (2005) "Tapping nature's energy source: an introduction to electrodynamic energy science", Akronos Publishing, Concord, ON, Canada.

62. Aspden H (2005) "A problem in plasma science", Akronos Publishing, Concord, ON, Canada.

63. Aspden H (2006) "Creation - the physical truth", Book Guild Publishing, Sussex, England.

64. Correa PN & Correa AN (2002) "Aether power from pulsed plasmas", Labofex Scientific Report LS-25, Akronos Publishing, Concord, ON, Canada. Delivered at the 1st Berlin Conf. On Innovative Energy Technologies, Berlin, Germany, 2002.

65. Von Engel A (1967) "Ionized gases", Oxford University Press, England, p. 285.

66. Correa PN & Correa AN (1997, 2001) "A light-irreducible split-aether continuum encompassing production of black (HFOT) and thermal (LFOT) photons", Akronos Publishing, Concord, ON, Canada, ABRI monograph AS2-11.

67. Lafferty JM (Ed) (1980) "Vacuum arcs - theory and applications", GE Co, Schenectady, NY, pp. 254-255.

68. Correa PN & Correa AN (2025) "Critical Appraisal of XXIst century energy science and technology (1): relevance of Nikola Tesla's inventions and discoveries, from the perspective of Aetherometry", *J Aetherom Res*, 4, 1:1-54.

69. Correa PN & Correa AN (2024) "Experimental Confirmation of the Aetherometric Theory of Temperature and the Conversion Equivalence of Electric and Thermal Energies", *J Aetherom Res*, 3(6):1-9.

70. Correa PN & Correa AN (1999) "Photoinduced arrest of the spontaneous electroscopic discharge and the Hallwacks experiment revisited", Akronos Publishing, ABRI Monograph AS2-08.

71. Correa PN & Correa AN (1999) "Aetherometric treatment of the energy radiation output by Tesla coils (2): massfree and massbound nonelectromagnetic frequency functions and resultant characteristic electromagnetic frequency of the coil", Akronos Publishing, ON, Canada, ABRI monograph AS2-14.

72. Correa PN & Correa AN (1999) "The indirect 'ORgone effect' of Tesla radiation: solar spectra for ambipolar Aether and Blackbody radiation", Akronos Publishing, ABRI Monograph AS2-17A.

73. Correa PN & Correa AN (2012) "What is a photon? And how and why are photons massless?", *J Aetherom Res*, 2(9):1-30.

74. Correa PN & Correa AN (2012) "The Hartree Energy of Hydrogen and the Impedance of the 'Vacuum'", Volume III of Aetherometric Theory of Synchronicity (AToS), Akronos Publishing, Concord, ON, Canada, ABRI monograph AS3-III.6.

75. Gewartowski JW & Watson HA (1965) "Principles of Electron Tubes", Bell Telephone laboratory Series, D. Van Nostrand Co., NY, NY.

76. Correa PN & Correa AN (2013) "Electroinertial Treatment of the de Broglie "Matter-Waves", Particle Acceleration, and the Compton Effect", Volume III of Aetherometric Theory of Synchronicity (AToS), Akronos Publishing, Concord, ON, Canada, ABRI monograph AS3-III.8.

77. Correa PN & Correa AN (1995) "Manually-operated stand-alone XSNRG™ conversion system", Labofex Scientific report Series, S1-021. **Submitted to Ontario Hydro in 1995. Published in IE, 1999, Vol. 4, 23:35-37.**

78. Shoulders K (2007) "Electron ensembles", *Infinite Energy*, No. 75:41-42.

79. Egely G (2013) "Fusion by pseudo-particles, Part I", *Infinite Energy*, No. 107:18-28.
80. Lafferty (Ed) (1980) *op. cit.*, pp. 282-283.
81. Correa PN & Correa AN (2025) "A (dis)conversation with ChatGPT on science", *J Aetherom Res*, 4, 4:1-23.
82. Greshko M (2019) "Cold fusion remains elusive - but these scientists may revive the quest", *National Geographic*, May 29.
83. Bakhoum EG (2009) "Very small scale electrostatic-confinement fusion apparatus", *IEEE Trans Plasma Sci*, 37:2090-2097.
84. Stephen LP et al (2002) "Motionless electromagnetic generator", USPTO Pat.# 6,362,718, March 26.
85. Bearden (2002), *op. cit.*, pp. 596-599.
86. Bearden T et al (2001) "The Motionless Electromagnetic Generator: extracting energy from a permanent magnet with energy-replenishing from an active vacuum", published by Magnetic Energy Limited, Huntsville, AL.
87. Aspden H (1994) "Power from magnetism", *Energy Science Reports #1*, Sabberton Publications, Southampton, England.
88. Pais S (2019) "Piezoelectricity-induced temperature superconductor", USPTO Pat. # 2019/0348597, November 14.
89. Pais S (2015) "The high energy electromagnetic field generator", *Int J Sci & Eng*, 3,4:312.
90. Pais S (2018) "Craft using an inertial mass reduction device", USPTO Pat. # 101,144,532 B2, December 4.
91. Correa PN & Correa AN (2020) "Human Experimental Bioenergetics", Vol. II of *Foundations of Aetherometric Biophysics*, Monograph AS2-29, published electronically by Akronos Publishing, Concord, ON, Canada.
92. Correa PN & Correa AN (2023) "The Toroidal Plasmaspheres of Stars and Planets under Gravitational-Ambipolar Equilibrium and the Dual-Sourced Geomagnetic Fields", Volume VII of *Aetherometric Theory of Synchronicity (AToS)*, Akronos Publishing, Concord, ON, Canada, ABRI monograph AS3-VII.8. See pp. 74-77.
93. Bostick WH (1957) "Experimental study of plasmoids", *Phys Rev*, 106, 3:404-412.

94. Zebuhr W (2015) "Charge clusters: the work of Ken Shoulders", *Infinite Energy*, No. 61:1-4.

95. Iriarte M (2018) "Naval Research Lab, MacB team up to design and test pulsed power sources", *Military Embedded Systems*, August 28 News, at militaryembedded.com

96. Krivit SB (2013) "Review of low-energy nuclear reactions", in *Reference Module in Chem, Mol Sci & Chem Eng*, J. Reedjik (Ed), Elsevier, Waltham, MA.

97. Correa PN & Correa AN (2004) "'Global Warming': An Official Pseudoscience", *J Aetherom Res*, 1(5):1-58.

98. Chadwick J (2023) "Is this the key to unlimited clean energy? Scientists beam solar power to Earth from space in world first", June 12, *Daily Mail online*.

APPENDIX 1

Labofex

Experimental and Applied Plasma Physics
42 Rockview Gardens
Concord, Ontario
Canada, L4K 2J6
Tel: (905) 660-1040
Fax: (905) 738-8427

August 6, 1996

Coastal Systems Station
CODE 2510, John Shelburne
6703 West Highway 98
Panama City
Florida
USA 32407-7001
Fax Address 1-904-235-5879

Dear Mr. Shelburne,

Thank you for your fax transmission and attached extensive enclosures, of August 2, 1996. I will pass this material on to our counsel, Mr. Conor McCourt, when he returns in early September, for his evaluation.

Following discussion with my partner, and subject to what Mr. McCourt might advise when he returns, I should like however to make a few remarks which you or Mr. Harvey Gilbert may want to address, and the answer to which may help our counsel formulate his advice.

The first element that occurs in this context refers to the legal situation you yourself are in. It seems to me that indeed you are well bound to principles and duties, but these are binding on you vis a vis the US government, not binding on you vis a vis myself and my partner nor, more importantly, binding on the US government or the Navy vis a vis myself and my partner. If you were a free agent acting for yourself as an entrepreneur, it might make some sense for us to sign a non-disclosure agreement with you as an individual, say if you had at your disposal the manufacture infrastructure required for a specific product application you had in mind. But you are essentially representing your employer, so, signing an agreement with you without your employer being the responsible Recipient Party is out of the question. That is precisely the kind of situation our standard disclosure agreement aims to prevent - we deal with representatives not intermediaries.

So, the only way to move forward with Confidential Information (and this includes any and every demonstration) is to engage in some form of a Confidentiality Agreement that binds your employer. Now, in this context, if Mr. Gilbert or any superior officer with the proper authority wants to, it suffices to add to the non-disclosure agreement, such as we submitted it to you, the clauses that they deem to be necessary and acceptable to them. We are flexible up

APPENDIX 1

LabofexExperimental and Applied Plasma Physics

to a point, and it makes more sense to engage our (expensive) counsel once there is something drafted on the table to consider concretely, rather than us incurring expense in drafting something that you or your employers have in mind. In a very real way this will save time, given that Mr. McCourt is away. It will also justify our bill, as we will have something concrete to present him with. In this context, I realize what you told me regarding your need to generate interest amongst your superior officers. This is not a novel situation, and we do appreciate your interest. But if your employers have previously considered financing investigation of devices such as the Adams motor, the Patterson Power Cell and others, it seems to me that the interest must be there to resolve what is in effect an obvious problem, the limitations of existing energy sources. So I do suggest that you seek the support of a superior officer in your endeavors, given that I know that commercial development of our technology for the applications you have in mind will take substantially more than the budgets that you appear to have been given in the past.

Mr. Gilbert is correct in advising you that as a point of contact regarding what is in the public record there is no need indeed for a Non-disclosure Agreement. But all the information is not in the public domain and is, by the very fact we protect it, in the confidential domain, and this includes know-how, commercial secrets, recent developments, projects and blueprints for intended applications, undisclosed methods of measurement, etc.

By the same token, you should also bear in mind that a Non-disclosure Agreement, if it contains rights/duties for a Recipient Party, implies absolutely no commitment to a business arrangement. All that it does, is to enable the interested party to evaluate the technology subject to the conditions of the Agreement.

So, I am afraid that as things now stand, and if you would like to move this matter forward, you must gather some support for someone with the proper authority to negotiate a Non-Disclosure Agreement with us, along the lines we have here described.

Do let us know your thoughts on these matters at your earliest convenience. Thanks for your interest in our work and your consideration of this matter.

Sincerely,

Paulo Correa, M.Sc., Ph.D.

facsimile
TRANSMITTAL

to: Dr. Paulo Correa
fax #: 905-738-8427
re: Responding to your fax of August 6, 1996
date: August 19, 1996
pages: 3, including cover sheet.

Dr. Correa,

I must apologize for sending the wrong legal document last time. That document covers contractual rules, viz. "Federal Acquisition Regulations - FAR's." What I should have sent you follows. It is "18 U.S.C. 1905 - Disclosure of confidential information generally". We have no contract, so "FAR's" do not apply. What is in place is a section from the U.S. Criminal Code that protects you, the holder of confidential information from unauthorized disclosure. Mr. Harvey Gilbert, CSS Patent Counsel, reminded me of the correct laws and provided this copy. He will answer any questions by you or Mr. McCourt regarding the specifics of further negotiations on your inventions and demonstrations of it. His number is 904-234-4646.

The whole point of trying to set up a demonstration is to stimulate interest. All of my sponsors require this, as the science establishing the operation of free energy devices cannot be confirmed at this time or likely accepted without a demonstration, they say. All other inventors I investigated (4) agreed to the protection of 18 USC 1905, but no one has yet come forward with a successful demonstration of a free energy device except Dr. Patterson. I hope you will be the next I am willing to discuss this and please write or call.

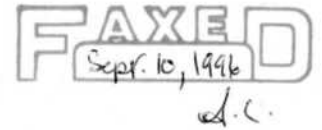
From the desk of...

JOHN SHELburnE
Mechanical Engineer
Coastal Systems Station.
6703 W. Hwy. 98
Panama City, FL 32407-7001

(904) 763-4077 (h), (904) 234-4485 (w)
Fax: (904) 235-5879 (w)

Labofex

Experimental and Applied Plasma Physics
42 Rockview Gardens
Concord, Ontario
Canada, L4K 2J6
Tel: (905) 660-1040
Fax: (905) 738-8427



September 10, 1996

Coastal Systems Station
CODE 2510, John Shelburne
Mechanical Engineer
6703 West Highway 98
Panama City
Florida
USA 32407-7001
Fax Address 1-904-235-5879

Dear Mr. Shelburne,

Thank you for your facsimile transmission of August 19, 1996, and enclosure. I apologize that it has taken me some time to respond to you. We have been waiting for our counsel, Mr. Conor McCourt, to return from vacation and to have a chance to consult with him regarding your interest in our technology.

We have now had a chance to meet with Mr. McCourt concerning these pending matters and have determined that the best way to proceed would be to have Mr. Harvey Gilbert, CSS Patent Counsel, call Mr. McCourt for a direct discussion during the week of September 16th-20th when Mr. McCourt will be in Toronto. Please let us know if this will be acceptable.

You may be interested to know that Dr. Harold Aspden has recently published a monograph entitled Energy Science Report No. 8- "Energy From Space: The Correa Invention". This is now available from:

Sabberton Publications
P.O. Box 35, Southampton
SO16 7RB, England.
Tel: Int. + 44-1703-769-361
Fax: Int + 44-1703-769-830.

Please do not hesitate to fax or call if I may be of further assistance.

I look forward to hearing from you-

Sincerely,

Paulo Correa, M.Sc., Ph.D.

CSS. DIVING SYSTEM BR

ID:1-904-235-5879

SEP 11 '96

9:58 No.001 P.01

facsimile
TRANSMITTAL

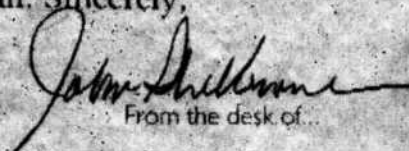
to: Dr. Paulo Correa
fax #: (905) 738-8427
re: Legal Counsel Telephone Discussion
date: September 11, 1996
pages: 1, including cover sheet.

Dr. Correa:

Thank you for your fax message of 10 September. I spoke with Mr. Harvey Gilbert today and he is agreeable to talk with Mr. McCourt during the week of September 16th through the 20th. I will place the call to you or Mr. McCourt (need tel. #) when Mr. Gilbert is ready and after I have Mr. McCourt on the line. I will bring in Mr. Gilbert via conference call at our location. The time frame is Monday or Tuesday morning, the 16th or 17th around 10:00am CDST.

I am excited at the prospect of working with you. I have been carrying on a self-motivated unfunded educational program here at CSS to educate scientists and engineers on the reality of new energy discovery, progress and inventions. Several people are "mind" believers, but I need some "heart" believers; someone who will work with me to get a funded program started here. I have determined that a demonstration device shown here is the best way to make further progress. It can function in a "black box" manner; it would only be necessary to show the over-unity phenomenon in a controlled experiment in a so-called "closed system" manner (but, of course, with ZPF and o/u systems, we suppose that all systems are open).

Also, thank you for Dr. Aspden's information. I will order his Report No. 8. I will also try to get some long-sought information on the work of Dr. Eric Laithwaite. Please confirm a trial date and time to set up the call. Sincerely,


From the desk of

JOHN SHEIL BURNE
Mechanical Engineer
Coastal Systems Station,
03 W. Hwy 98
Panama City, FL 32407-7001

(904) 763-4077 (h), (904) 234-4485 (w)
Fax: (904) 235-5879 (w)

Labofex

Experimental and Applied Plasma Physics
42 Rockview Gardens
Concord, Ontario
Canada, L4K 2J6
Tel: (905) 660-1040
Fax: (905) 738-8427

September 12, 1996

Coastal Systems Station
CODE 2510, John Shelburne
Mechanical Engineer
6703 West Highway 98
Panama City
Florida
USA 32407-7001
Fax Address 1-904-235-5879

Dear Mr. Shelburne,

We have received and thank you for your facsimile transmission of September 11th, 1996. We have forwarded a copy of your letter to Mr. McCourt's attention but have learned from his assistant that she is unable at this time to confirm the exact time of 10:00AM on the mornings of September 16th or 17th. We think it preferable, as Mr. McCourt has been fully apprised of our communications with you and is in possession of all pertinent documentation, that the best way for you to proceed is to have Mr. Gilbert call Mr. McCourt directly (with you on the line, if you so wish) rather than attempting to coordinate a conference call with all parties on hand simultaneously. Mr. McCourt is fully aware of our requirements and if he and Mr. Gilmore are able to reach an understanding regarding confidentiality which will satisfy your needs as well as our own, it will then be quite straightforward for us to hammer out the specifics of the next steps.

Mr. McCourt's address and numbers are as follows:

Mr. Conor D.M. McCourt,
McCarthy & Tétrault

We hope this is satisfactory and look forward to hearing from you.

Sincerely,

Paulo Correa, M.Sc., Ph.D.

DIVING SYSTEM BR ID:1-904-235-5879

OCT 23 '96 9:41 No.001 P.01

facsimile
TRANSMITTAL

to: Dr. Paulo Correa
fax #: 905-738-8427
re: Where do we go from here?
date: October 23, 1996
pages: 2, including cover sheet.

Dr. Correa,

I haven't heard from you lately. Do you hold out any hope that you can do a demonstration for the U.S. Navy? The two legal counsels have talked, but what have you decided?

For your information, I have made no further progress getting technical or administrative help from my associates here. They indicate they are through reading about free energy, and say they have "closed the book!" I asked them about having a demonstration of a device that showed some anomalous behavior. This seems to be the only method to access any of their interest in further sponsoring a project based on such a device. I am left wondering how to get the world at large started on the way to seriously considering anything to do with free energy? Will it take another energy crisis? Or perhaps some adversary using a form of free energy to the western world's disadvantage? Perhaps that's the human condition: forever working on damage control; never planning proactively. Do we need some form of spiritual metamorphosis before we can handle these situations rationally?

Tom Bearden talked here on October 11th. for a few souls that turned out to hear him. I thought that he gave the best physics foundations lecture that I ever heard. An orthodox scientist which attended later remarked, "I'm closing the book on this subject!" What I was left with was the knowledge that I had at least tried to educate them on new energy science.

From the desk of...

JOHN SHELburnE
Mechanical Engineer
Coastal Systems Station
6703 W. Hwy. 98
Panama City, FL 32407-7001

(904) 763-4077 (h), (904) 234-4485 (w)
Fax: (904) 235-5879 (w)

Labofex

Experimental and Applied Plasma Physics
42 Rockview Gardens
Concord, Ontario
Canada, L4K 2J6
Tel: (905) 660-1040
Fax: (905) 738-8427

October 31, 1996

Coastal Systems Station
CODE 2510, John Shelburne
Mechanical Engineer
6703 West Highway 98
Panama City
Florida
USA 32407-7001
Fax Address 1-904-235-5879

Dear Mr. Shelburne:

I am sorry that naturally you feel disappointed regarding the fact that our negotiations have not really gone anywhere. So do I. Yet, I have few comments that I should like to make.

First of all, if the US Navy has been investigating all the devices you have mentioned, I can see why they are through with 'free energy', for indeed there is close to nothing out there, and where there is something, that something requires a real research effort, rather than a mere consultancy. But being through with such matters is too easy a proposition, as it is like saying that one is through with living or through with investigating the unknown when so much is unknown about everything. If this is the attitude and policy of the US Navy then, and even though I can understand why, it is a bad sign of sclerosis in a major American institution and a major hurdle to its very survival into the XXIst century. For how long can the US Navy rely on oil and atomic power? Can the Admirals afford to be forever asleep at the wheel? By what you say, it seems that they think they can. Well, then, good luck to them!

Now, on a personal note: I can and I do empathize with your position, and in this I share the views of Dr. Aspden. If your situation is as you describe it, it looks like you should probably quit before even your job is declared superfluous! Unfortunately, I do not believe that bringing in Bearden was the smartest move you could have made as, I for one, believe (and *know*) that his 'theories' and papers *are* pure gibberish.

I would also like you to understand my position and that of my partner. Our approach to

LabofexExperimental and Applied Plasma Physics

the matters at hand is a very simple one: our purpose is to develop and license the technology. It is a business purpose, not one of education or publicity, per se. We do provide access to know-how and information to interested parties that are (1) serious about doing business with us, (2) have something to offer us, and (3) will commit to protect our rights on our terms, which are reasonable and subject to alteration via any negotiation with a clear cut purpose. We do not believe in black-box demonstrations. Either you 'see' it and it is there, or it is there but you cannot 'see' it, which is as good as naught. Hence, our approach to this matter is simple: once we have adequately satisfied ourselves that any prospective party is serious, we execute our standard CDA and provide any of a set of open demonstrations, some of which may involve fees. Now, you avow that your sponsors are not serious due to their waning lack of interest in the matter of 'free-energy'. Secondly, you need support from the brass in order to get our CDA executed. As there is none, we are effectively at an impasse. Your solution of appealing to our generosity and provide the infusion of belief needed to re-interest the brass, hopefully in our technology, is a non-starter as it assures us zero protection from competitors and the US Navy itself, no matter how many patents we have been granted. It has been some time since business was carried out on trust alone- we, unfortunately, are not a society of gentle men and women. This approach is therefore out of the question, no matter how much I may empathize with your situation.

Lastly, you are dead right about the fact that it is indeed our social condition to be forever condemned to damage control, with little or no foresight. Even the energy crises have had little effect, no matter how carefully they were crafted. The problem is endemic to the social psyche of Man. The machine is out of control and, like it or not, only ghosts are at the commands.

With this grim bit of humor, I shall sign off. I'll be pleased to hear from you at your convenience.

Sincerely,

Paulo Correa, M.Sc., Ph.D.

APPENDIX 2

Source:

<http://www.repp.org/discussion/green-power/200004/msg00010.html>

REPP-CREST
1612 K Street, NW, Suite 202
Washington, DC 20006

Green-power Archive for April 2000
12 messages, last added Mon Oct 29 19:05:45 2001

[Date Index][Thread Index]
GP: Shelburne Submission to Strategic Plan 2000

> -----Original Message-----
> From: Shelburne John W DLPC
> Sent: Friday, April 21, 2000 1:08 PM
> To: 'Strategic_Plan@hq.doe.gov'
> Cc: Ramey R A (Tony) DLPC
> Subject: Submission to Strategic Plan 2000

[snip]

I have worked for the U. S. Navy for ten years as a civil service mechanical engineer. Since 1993, I have investigated on a not-to-interfere, unfunded basis alternative sources of energy and ultra-high technology. These possible technologies offer unique solutions to intractable problems we face in providing the Navy with efficient solutions.

Here is a list of scientists and inventors who I strongly believe can demonstrate the practicality of clean-energy technology:

- 1.) H.E. Puthoff, Ph. D., theoretical basis for practical extraction and use of "Zero-Point Energy (ZPE),"
- 2.) Harold Aspden, Ph. D., workable, simplified theoretical approach to extraction of ZPE and anti-gravity,
- 3.) Paulo Correa, Ph. D., patented, functional "Over-Unity Coefficient Of Performance (COP > 1)" ZPE extraction device,
- 4.) Randall Mills, Ph. D., patented and functional COP > 1 energy production from "below ground state" hydrogen atoms,
- 5.) James Griggs, functional COP > 1 steam generator,
- 6.) John Bedini & T. E. Bearden, COP > 1 battery power supply,
- 7.) Takahashi; Kawai; Minato, COP > 1 electromagnetic engines (over-unity electric motors),
- 8.) Perfect Science Company, Turkey, remediation of existing super-fund class toxic waste problems.

I hope this submission and list will be evaluated fairly. I will stake my reputation and job on the validity of this submission.

I gave a briefing to the Pentagon Office of The Joint Chiefs J-6 for C4I on ultra-high technology electromagnetic applications in 1996. I know from talking with management officials in DARPA, ONR and NRL that these people recognize the reality of practical Zero-Point Energy extraction. The political climate was not right to talk about this in public, so their comments have to remain off the record. It is my most earnest wish that The DOE Strategic Plan staff will recognize ALL possible sources of non-polluting energy and begin a vigorous effort to research and develop these. Our environment which supports all of us is threatened. Let's be honest in doing something about the environmental problem.

Very Sincerely,

John Shelburne, Mechanical Engineer, Coastal Systems Station, NSWC - DD

John Shelburne

(850) 234-4485

ShelburneJW@ncsc.navy.mil

-----above forwarded by:

David Crockett Williams, C.L.U.

General Agency Services gear2000@lightspeed.net

<http://www.angelfire.com/on/GEAR2000/genagency.html>

APPENDIX 3

On the Mallove-Rothwell confrontation re Cold Fusion/LENR

This controversy was not just and simply about "cold fusion". It was about Mallove championing Aetherometry, including the latter's very different view of non-thermonuclear fusion than that espoused by Rothwell and the "cold fusioneers" (now the LENR peoploid), and about Rothwell and others trying to wrestle control of Mallove's *Infinite Energy* journal and laboratory from Mallove himself. We have documented this controversy - and will continue to do so - at the website:

eugenemallove.com

So, let us test ChatGPT on this subject:

Q: Who is Eugene Mallove?

ChatGPT: Eugene Mallove was a scientist and advocate for cold fusion research. He earned his PhD in Environmental Health Sciences from Harvard University and served as a science writer for MIT's Technology Review [**Not as any science writer, but as the Chief Science Writer for the MIT News Office!!**]. Mallove became widely known for his support of cold fusion, a controversial and disputed field in which he believed that nuclear reactions similar to those in stars could occur at room temperature, potentially revolutionizing energy production [**Note the ignorant language - "energy production"...**]. Mallove authored several books on cold fusion and alternative energy, aiming to bring greater attention and credibility to the field. Tragically, he was murdered in 2004 during a robbery at his Connecticut home [**False: at his parents' home that he had rented out**]. His death was a significant loss to the scientific community and to the advocacy for alternative energy research.

Remark: Notice that there is no mention of the overriding data-falsification nullifying the Pons & Fleischman cell results of anomalous heat evolution, that led Mallove to resign in disgust from his position as Chief Science Writer. Notice further that no mention is made of Mallove having, in the aftermath, created the *Infinite Energy* publication or the New Energy Foundation. Also, that the cold fusion/LENR field is called "controversial and disputed" - this is so when the chatbot refers to Mallove, but *not* when it refers to Rothwell:

Q: Who is Jed Rothwell?

ChatGPT: Jed Rothwell is a prominent advocate and researcher in the field of cold fusion, also known as low-energy nuclear reactions (LENR). He is the author of "Cold Fusion and the Future" and the co-author of "The Science of Low Energy Nuclear Reaction," both of which are important texts discussing the theoretical and experimental aspects of LENR.

Remark: The bot lies - it refers to Rothwell as a "researcher", yet this Literature bachelor has only co-authored one (1!) research paper (2019) in all his life (with the idiot T. Mizuno, who did the lifting) which purports to develop a new LENR method that yielded a grand COP of 1.12... With zero citations (and with semanticscholar.org

awarding him the lowest "h factor" of 1), Rothwel is "prominent", while Mallove is not... Likewise, according to ChatGPT, Rothwel has contributed "important texts", while Mallove apparently has not... Simply demeaning!

ChatGPT (cntnd): Rothwell has been actively involved in the advocacy and promotion of cold fusion research, particularly through his work with the nonprofit organization LENRIA (Lattice Energy LLC). He has contributed extensively to the understanding and dissemination of information related to cold fusion, often providing critical analysis and updates on research developments in the field. His efforts have been aimed at challenging the skepticism surrounding cold fusion and encouraging broader scientific investigation into its potential as a clean and abundant energy source. As such, Jed Rothwell is recognized as a key figure within the cold fusion research community.

Remark: Notice that nowhere does the chatbot bother to tell us that Rothwell *has no scientific qualifications*, and is no physicist - nor that he has never worked in a lab, at a bench. He is just a popularizer who has promoted 'cold fusion' under a new sobriquet, LENR. Yet, he is credited not with pseudoscience, but with "having contributed extensively to the understanding (...) of information related to cold fusion, often providing critical analysis". What analysis did Rothwel ever pen, let alone a critical one? Where did this cretin chatbot go to learn such high praise for this Rothwell, other than from its programmers? Are they not all simple hires from the masters of the multiverse? Watch the bot rinse clean the history of the Mallove-Rothwell confrontation (this is how historical revisionism distorts and eliminates the unwanted past):

Q: Why was Eugene Mallove against Jed Rothwell?

ChatGPT: There isn't evidence to suggest that Eugene Mallove was specifically "against" Jed Rothwell [That's a good stalinist one!]. Both Mallove and Rothwell were proponents of cold fusion research and advocates for its recognition within the scientific community. They shared similar goals in promoting the study of low-energy nuclear reactions (LENR) and advancing understanding of its potential as an alternative energy source. It's possible that there might have been disagreements or differing viewpoints on certain aspects of cold fusion research within the community, as is common in scientific discourse. However, any specific personal animosity or direct opposition between Mallove and Rothwell is not well-documented or widely known. Both individuals contributed significantly to the field of cold fusion through their writings, advocacy, and efforts to promote scientific investigation into LENR. Their work has helped shape the ongoing discussion and research efforts in this area.

Remark: The chatbox is partially right in stating that the confrontation of Mallove and Rothwell is not well known, because it is mostly documented in emails and letters, and the cold-fusion community did its very best to suppress knowledge of it - specially so after the murder of Mallove. *Et pour cause!* However, it was well documented in the website

aetherometry.com
Also, *Vd infra*.

Q: What was the role of Aetherometry in the confrontation between Eugene Mallove and Jed Rothwell?

ChatGPT: Aetherometry, developed by Paulo and Alexandra Correa [!!!], is a theoretical and experimental approach that posits the existence of the aether as a fundamental medium underlying physical phenomena. It encompasses a range of theories and experimental findings that depart significantly from mainstream physics, particularly in areas such as energy, gravity, and electromagnetism. Regarding the confrontation [**But the chatbot just said that there was *no* confrontation...**] between Eugene Mallove and Jed Rothwell, it's important to note that Aetherometry played a peripheral role rather than being a central point of contention between them.

Remark: How does the chatbot know that Aetherometry was peripheral and not central to the confrontation between Mallove and Rothwell? In effect, it was more than central - it was largely causative! It was about fundamental science and physics issues. As to the campaign that Rothwell mounted against Mallove, and the latter's desire to sever their common partnership - it became even uglier, as Rothwell's allies secretly wrote purely judeophobic, slanderous letters to all of Mallove's sponsors, in the hopes of damaging both his reputation and his funding.

ChatGPT (cntnd): Both Mallove and Rothwell were primarily focused on advocating for cold fusion research and its recognition within the scientific community. They shared a common goal in promoting alternative energy technologies and challenging mainstream skepticism towards cold fusion. However, Aetherometry and its proponents, such as the Correas, have been controversial within scientific circles due to their departure from established physics principles and their assertions about the nature of the aether and its interactions with electromagnetic fields [**What is here so amusing in the loose language of the bot is that, in Aetherometry, there simply is no direct interaction between electromagnetic fields and massfree electric or ambipolar energy! It is only through the intermediacy of massbound charges that photons are related to ambipolons.**]. This controversy has led to debates and disagreements with mainstream physicists and researchers who adhere to conventional theories. In summary, while Aetherometry's unconventional theories may have contributed to broader debates within the alternative energy and physics communities, they were not a direct cause of the confrontation between Eugene Mallove and Jed Rothwell. Their disagreements were more likely related to differing perspectives on cold fusion research, its viability, and the appropriate strategies for gaining scientific acceptance.

Remark: The longer the chatbox babbles, the more it talks itself into believing there was a confrontation... One that it now explains by a soft lie: "...more likely related...". For an antidote to these automated blatherings, the reader is again directed to:
eugenemallove.com

Q: Did you know that Aetherometry was the reason why Eugene Mallove and Jed Rothwell had a confrontation?

ChatGPT: I couldn't find any information or credible sources that suggest Aetherometry was the direct reason for a confrontation between Eugene Mallove and Jed Rothwell. Both individuals were primarily focused on the field of cold fusion and advocating for its

recognition within the scientific community. Their interactions and any disputes likely revolved around differing views on cold fusion research, its experimental findings, and the broader implications for energy science. Aetherometry, developed by Paulo and Alexandra Correa, proposes alternative theories about the nature of the aether and its role in physics, which are distinct from mainstream scientific understanding. While Aetherometry has generated controversy and debate within scientific circles, there's no documented evidence that it was a central factor in any specific confrontation between Mallove and Rothwell. If there were any indirect connections or disagreements related to Aetherometry between Mallove and Rothwell, they would likely have been part of broader discussions or debates within the alternative energy and physics communities rather than a direct cause of personal confrontation between the two individuals.

ChatGPT can make mistakes. Check important info.

Remark: The bot just rinsed and repeated... As to what Paulo Correa responded to Rothwell, in the wake of the latter's long string of debasing attacks that began after the New Hampshire (Concord) Conference on New Energy in 1998, the reader is directed to a document that for over 20 years has been on the web - in the public domain - even if Google stubbornly refuses to index and list it, and the GPT chatterbot is unable to find it:

Correa PN (2004) "The serpent's tooth and its egg (or: how the stupid are so often malicious)", at

aetherometry.com/Electronic_Publications/Politics_of_Science/Serpents_Tooth/serpents_tooth.html

Note on the authors (paraphrasing the last situationist)

In science, whether in experimental research or in theory, the Correas always did what no one else was doing, and refrained from doing what everyone else was doing. To aggravate their case, they have been at it for 4 decades.

It is obvious today that there are no longer dangerous thinkers, damned artists or cursed scientists - not now that thought has been replaced by AI, that art has become entertainment, and science has been destroyed by the bureotechnocratic control of a fabricated consensus on metaphysics. Every quidam can ascend to the status of a "functionary or technician of culture". Hardly anyone says no to this state of affairs. And no one thinks, composes or researches, but as an institutional servant.

The Correas did not ply to this servitude. The world penalized them by ignoring their work. Thereby the world may have rendered itself just as perfectly insignificant as it judged their work to be.

Figure 1A
Conventional VI Diagram

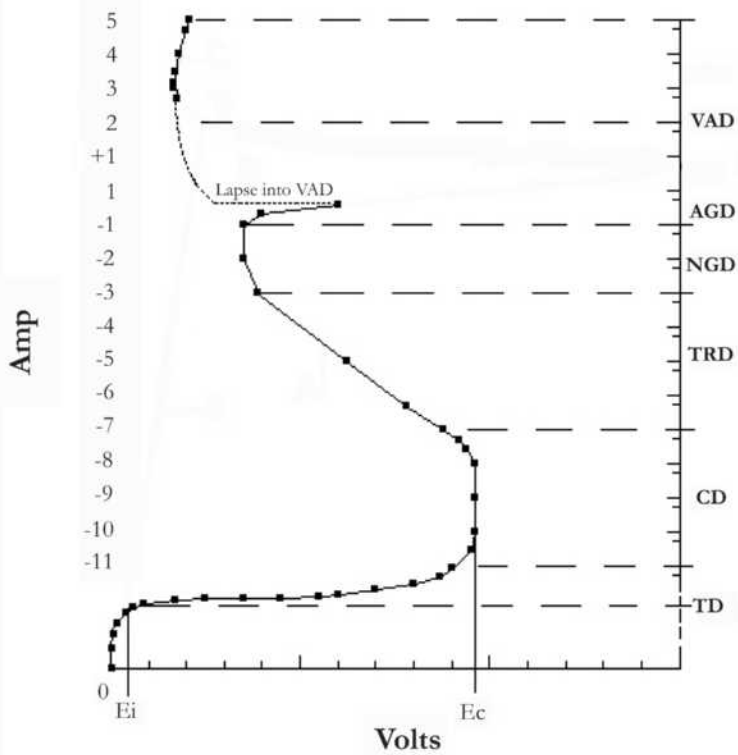
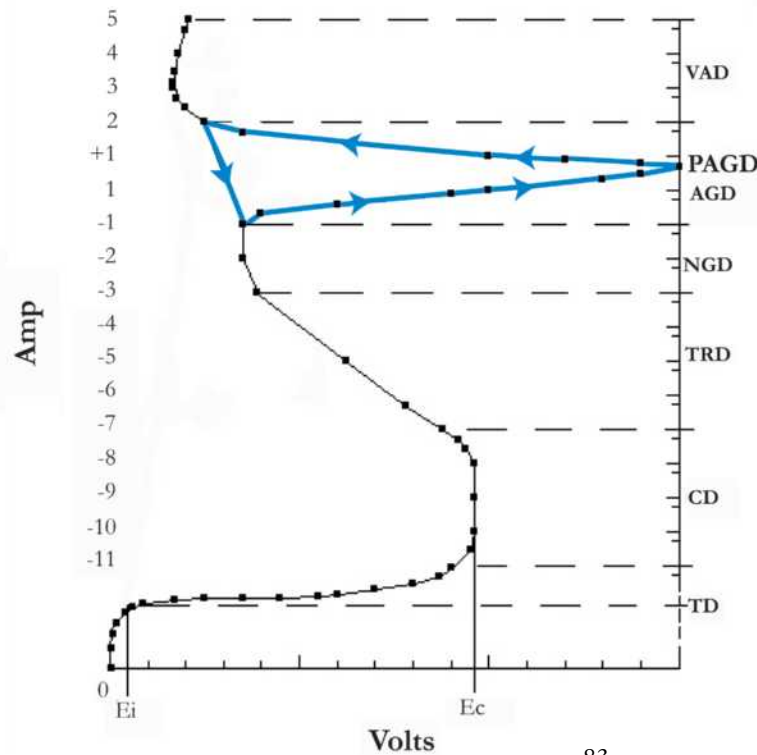


Figure 1B
Discovery of the PAGD VI Diagram



- PAGD - Pulsed Abnormal Glow Discharge
- VAD - Vacuum Arc Discharge
- AGD - Abnormal Glow Discharge
- NGD - Normal Glow Discharge
- TRD - Transitional Region Discharge
- CD - Constant Region Discharge
- TD - Townsend Discharge

Figure 2

PAGD reactor operated with outputs of up to 1 kilowatt,
provided with heat extraction and mirroring-prevention system of baffles.



Figure 3

Dual-cathode PAGD reactor with central tungsten rod. Electron plasma vortices are observed
in the lower cathode, and Al^{2+} positive columns are observed in the upper cathode, their
electron plasma channels having already struck the anode

