

In practice, mitigation may be difficult to implement, both politically and economically. Making progress in this endeavor requires incentives that are both appealing and feasible, long-term commitments by its champions, and an investment of financial resources by its backers, usually in the face of a highly uncertain threat. It is much easier to pass along the problem to the next generation.

It is therefore encouraging that mitigation is receiving increased emphasis, a situation that has come about through a combination of circumstances.

Mitigation Emerges as Major Strategy for Reducing Losses Caused by Natural Disasters
Board on Natural Disasters, *Science* **284**, 1943-1947 (1999)

A severe storm lasts hours but can leave years of damage behind. So scientists are keen to find out more about what triggers hurricanes and typhoons... In the meantime, we remain vulnerable, as demonstrated by the devastation of New Orleans by Hurricane Katrina in August 2005. News@nature.com, 5 October 2005

8 March 2006

Dr Donald Kennedy
Editor-in-Chief
Science
Washington, DC 20005

Dear Dr Kennedy,
Hurricane Mitigation

I am submitting herewith a short paper for your kind consideration for publication in your esteemed journal. Please be good enough to give it some serious consideration. Based on the proposed method, loss to life and property in tropical cyclones could in future be minimized worldwide.

Natural disasters are better predicted, mitigated or even circumvented when the underlying physics is better known. As you may also agree, it should matter little whether a possible solution comes from within the physics community or from without. (I am an engineering consultant by profession, having also worked for some leading Houston-based international project-management consultancies in the past; *Discover*, April 2002, pp 66-71, has a feature on my research work and includes a short biography.)

What's new in the paper here is the insight into "geoneutrinos" as the prime mover in hurricanes. Predominantly antineutrinos from the Earth's radioactive core, these were predicted in my [book](#) published in New York in 1999; but the unexpected breakthrough findings by KamLAND (in a "landmark article" in *Nature*) came only last year, perhaps, in response to my [appeal](#) to the KamLAND Collaboration in 2003.

The neutrino propagates in an ever-expanding circle from the equator of the parent nucleon. The neutrino thus intercepts much more atoms than the essentially needle-like photon does. However, with intensity dropping as an inverse function of distance, it is the detection of neutrinos that becomes ever a challenge, in contrast to photons. Therefore, contrary to popular belief, the neutrino does affect *every single subatomic particle of matter* in its path, though ever so subtly; the occasional electron getting detectably hit being the result of constructive interference of the neutrino wavefronts.

The strategy with hurricanes, therefore, is to encounter them – collectively, rhythmically, and at the early stages of their formation – with as much air mass as can be mustered to reduce or eliminate their potential. And all this is done by proxy from a central location without going after the budding twisters individually, thanks to the “butterfly effect,” or the communion of atoms.

Coriolis forces, global warming, and such, can now be deemed only as secondary factors contributing to the final strength of the hurricane. Not surprisingly, the neutrino holds not only answers to the nagging questions on hurricanes but also explanations to other seemingly strange atmospheric phenomena universally. One such of late concerns the startling observation that some light solar-wind and cosmic-ray particles (electrons) at the geomagnetic poles are even getting accelerated back into space (by the outbound neutrinos, naturally)! Also detected now in Jupiter and Saturn, these go to demonstrate the effect of neutrinos on matter. (As predicted further in my book, the neutrino flux from a planet or star would peak in intensity at the poles.)

Professor Giorgio Gratta of Stanford University was the topmost academic in the KamLAND Collaboration who took me somewhat seriously and corresponded with me at a time when Earth’s core was not even in their scope of work. However, my continued appeal to neutrino observatories worldwide seemed to have a positive effect at least in Russia and the Netherlands, as [reported](#) in *Discover*, July 2004. This may well have been the deciding factor for the KamLAND team to jump the gun and bring the Earth’s core quickly into focus for possible antineutrinos; and focus they did, with astounding results. Professor Gratta may still remember my work and may be a good referee for this paper.

As you may only be too aware, there’s a paradox at the heart of present-day physics. Instead of producing answers to original questions, basic research is churning out only more new questions (with also the risk of dissuading top students and funds more and more from the field). The divergence could only mean that our very fundamentals are in dire straits, despite the hype that convergence, or unification, is just around the corner; please see also box below.

Since this all-embracing final theory is yet to surface in the mainstream, the aforementioned work of mine is referenced in the paper as a tributary wherever relevant. **HOWEVER, THE LATTER MAY BE ENTIRELY IGNORED OR EDITED OUT SINCE THE RATIONALE FOR THE MITIGATION METHOD HERE PROPOSED SHOULD FIND ACCEPTANCE BASED SIMPLY ON PREVAILING EMPIRICAL KNOWLEDGE AND EVERYDAY EXPERIENCE.**

Although the controversy linking hurricane strength to global climate changes seems still to persist, I am confident that you will, from your esteemed position, weigh impartially what is presented here to alleviate the related human suffering which is never in dispute.

Hope you will also find the paper worthy of a preliminary field test to be carried out without delay. The Federal Emergency Management Agency, Board on Natural Disasters, National Oceanic and Atmospheric Administration, Department of Defense, National Aeronautics and Space Administration, and others, too, could subsequently review the paper for any joint commitment to the pilot project. It would be a great first step toward effectively responding, once and for all, to that annual distress call of humanity to its science tower.

The USA stands most to gain; and so, the first choice of submission of this paper had to be to – *Science*.

I await your kind response.

Thank you and best regards.

Sincerely,

Eugene Sittampalam

There is a paradox at the heart of present-day physics that is not often remarked upon. It goes as follows. There is tremendous excitement among particle physicists, who are trying feverishly to develop a unified theory of all interactions and particles, and believe they are getting closer and closer to that goal. But the reality is that physics is becoming more and more fragmented. The unity that has been a great underlying theme in the development of physics is sharply contrasted with what is happening to the subject in practice.

No ultimate truth in grand unification

George Ellis (Mathematics Department, University of Cape Town, South Africa), *Nature* **401**, 527-528 (1999)

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Hurricane Mitigation

Eugene Sittampalam

Spin of the hurricane is what amasses and concentrates its destructive forces to lay waste life and property to alarming proportions in its wake. Neutralize or attenuate this angular momentum and you correspondingly reduce the final statistics. It's easier said than done; or so it seems to us even today in view of the stupendous energy and mechanical strength the giant wheel can muster, dwarfing even man's nuclear weaponry (1).

Admittedly, you can't beat them with sheer brute-force intervention. Why not then join them at their own game and nip them in the bud? In other words, counter the forming hurricanes – collectively, rhythmically and at the early stages – with as much air mass as possible to reduce or eliminate their potential.

More specifically:

- team up with a comparable air mass in the vicinity and gently stoke it up – in rhythmic pulses and to spin in the opposite sense;
- the sympathetic response, or resonance, would stir up more and more air mass into the artificially created stream circle;
- the thus waxing counter spin would increasingly attract the forming hurricanes in the wider basin around; and,
- cause the two opposing vortices to gradually and harmlessly dissipate their kinetic energy (wind energy) over the trap area.

The communion of atoms

Winds and hurricanes have long-distance contacts and are influenced by one another (2). At the quantum mechanical level, we call it weird, or nonlocality; but the atom is indeed a breathing entity and the ultimate communicator in nature (3). Spontaneous exchanges, at the speed of light, occur between atoms at every given atomic energy level even in the ground state. The atom is thus in ever vibrant contact with all other atoms near and far removed even in its so-called unexcited state (making absolute zero temperature unattainable in nature even in principle). Thus, all of nature – classical matter and the classical vacuum alike – is closely knit as a vibrant whole; and nothing physical ever occurs in “absolute isolation,” a nonevent in our world of observation.

Hurricane seedlings are thus indeed vulnerable:

1. They can be artificially neutralized, or their potential rendered harmless, even by proxy.
2. This mitigating action can be maximized rhythmically with available energy and technology.

And these two are the main features of the simple game plan proposed here.

The rhythm of life

The unenergetic and virtually lifeless tot emerges effortlessly from the mother’s womb only by the rhythmic stimulation of its environment, immediate and distant. It is never otherwise (save for man’s brute-force, or caesarian, intervention). In quantum mechanics, we call it counterintuitive, or bizarre, or the tunneling effect; but fundamentals remain the same across nature’s vibrant realm. The five-minute wave period of the Sun’s resonance, or helioseismic oscillation, that are now known to sweep through Earth incessantly in the form of energetic particles (4, 5) and the five-minute contractions that the mother feels just before baby’s arrival

(6; or ask a mother!) need not be sheer coincidence.

More to the point here of mitigation rather than solely inducement, it takes much energy for that child, in later years, to reach a high peak on her own on that garden swing in the backyard. But once her potential is reached and should she tire, a gentle – yet rhythmic – prod is all that is required of the mother to maintain the motion. By the same token, to stop an energetic yet errant child hurting other little ones around with that swing, the projectile could even be brought down to rest within minutes by a gently opposing and rhythmic tap from the delicate mother, without recourse (and hurt!) to super-man father.

The Prime Mover

The tornado has a narrow path and is often accompanied by a funnel-shaped cloud; whereas the hurricane (or tropical cyclone or typhoon) has a violent wind of a much larger extent. The basic mechanism that seeds or triggers these violent and persistent storm systems is still ill-understood. There are many unanswered questions to this day about these scourges that whip life and property year in and year out (7). Perhaps, the most mystifying is: What sustains these violent vortices?

Fundamentally, the agent that stokes these whirlwinds, even over relatively cold water, is the electron antineutrino (hereinafter referred to as neutrino, for brevity) from the Earth's radioactive core (8, 9). It is the same countergravitational flux, emanating predominantly from the region of the core-mantle boundary, that stimulates tectonic plates to move, continents to drift, mountains to grow, and even keep our Moon in stable orbit under eons of perturbation (10, 11). And the effect reaches a devastation peak in hurricanes when the Sun, too, comes in to aid and abet.

Another long-vexing problem for societal safety has concerned the hurricane's track and intensity forecasts (12). However, placing the deluge of data today in proper perspective, it's not hard to see even that aspect of the final picture emerging. How, why, and when a hurricane's intensity changes or its trajectory shifts may now be traced mostly to the solar remote control (13, 14, 15).

The solar wind is already known to consist essentially of (sub-c) protons and electrons (16, 17). But equal in particle number to the electrons are the hitherto unknown (speed-c) neutrinos in the same coronal discharge. The proton, electron, and neutrino of this solar efflux are the products of neutron decay, which final stage of radioactivity creates the solar corona (18). Naturally, the solar wind would gust during high solar activity, visible signs of which are the sunspots the large coronal mass ejections (CMEs) leave in their wake during such heightened periods (19, 20). The earthbound wind particles smack Earth's atmosphere right across the (dayside) face. While the protons and electrons tend to get diverted more toward Earth's magnetic poles, the neutral neutrinos penetrate deeper with least scattering normal to Earth. The influx of solar neutrinos is thus more intense closer to Earth's equator; and the resulting pressure depression (in the energy field of atmospheric molecules) triggers vertical and elongated swirls in Earth's atmosphere, the warmer (more agile) regions being more susceptible and responsive to the call. Not surprisingly, Earth weather and solar activity are much more interrelated than we may now suspect.

Clearly, a swirl formed as above may spin in either direction; but the ones that get sustained are determined by the torquing action of the Earth's short-range field. This may be visualized as follows. Take a sprawling body of matter such as a mass of air in the Earth's northern hemisphere. Along the latitude, the body would experience an eastward force from the Earth's

pro-rotational neutrino field; but the force will be greater on the half that is in the lower latitudes compared to the other half in the upper latitudes. This is consequent to the fact that Earth's core rotates in the same sense as the mantle (21, 22); the geoneutrinos will thus have a net prograde influence on outside bodies (Moon included!); which tangential and eastward effect would peak at the equator; wherefrom it would drop gradually to zero at the poles, where the radial and outward (countergravitational) effect would peak. Thus, an air mass which is swirling counterclockwise (as viewed from above) would have a better chance of survival than an equally energetic one swirling clockwise. It is the simple reason why we see the long-lived twisters in the northern hemisphere to have a counterclockwise spin. (A similar argument holds for clockwise spin in the southern hemisphere.)

It may also be (rightly) argued that Earth's ground rotation directly influences these so-called cyclonic directions, that is, by Coriolis forces and air friction transmitted from ground to the storm clouds above. Nevertheless, the planet's prograde and countergravitational neutrino field should prove the *primary* cause to explain not only this but also all the other related observations universally.

One such universal feature now coming strongly to light is the model-shattering reality that the inbound solar and cosmic mass particles are not only resisted by the planet's atmosphere but a good and detectable part of the lighter particles (electrons) are also even accelerated back into space (23) – by the planet's own outbound neutrinos! On home planet, when conditions are right, these encounters between inbound mass particles and outbound neutrinos (both fluxes of which are most intense at the magnetic poles) are seen to create the now all too familiar auroras over the polar regions (23). Thus, in a similar manner over the equator, hurricanes become the

creation of the inbound and outbound neutrinos: solar neutrinos seed and sustain the whirls and their long vertical funnels; and the countervailing geoneutrinos help stoke angular momentum at a natural frequency.

Further, the power of the earthbound neutrinos may be indirectly inferred. The protons and electrons of the solar wind and cosmic rays are resisted also by the Earth's cloud cover. Consequently, the less inertial electrons tend to accumulate more in the upper clouds, while the much higher-momentum protons pierce through to collect in net in the lower layers and even terra firma. The energy released in lightning globally (between clouds and between clouds and ground) thus becomes an indicator of the approximate strength of these two extraterrestrial particles. The third musketeer, the neutrino, although not much hindered by the clouds, nevertheless, ripples through the vacuum energy field affecting, subtle though it be, every single atom in its radiant path (24). Its strength would thus be comparable to that of its electron sibling – far in excess to scatter in and sustain the low-pressure vortex funnel of any killer hurricane.

HOWEVER, IT IS HEREBY EMPHASIZED THAT IDENTIFYING THIS PRIME MOVER OR EVEN REFUTING THE BASIC (NEUTRINO) THEORY IS NOT AT ISSUE HERE TO FIND A PRACTICAL SOLUTION TO NEGATE OR MITIGATE HURRICANES (OR OTHER TWISTERS) ALONG LINES PROPOSED HERE.

The rationale for which, on the other hand, should be second nature to us by now.

St Louis Blues

Certain global locations and environs offer the warm, throbbing, and agile conditions required for swirling cloud masses to accumulate and intensify therein to life-threatening thresholds.

Counter it in good time with as much air mass as can be mustered to swirl in the opposite direction and you even eliminate in its entirety the destructive potential of the forming hurricanes around.

The USA, especially, has the wherewithal today to put together such a timely countermeasure and that, too, in her own backyard – the Gulf of Mexico. Three sisters, Katrina, Rita, and Wilma, lately caught everyone here by surprise by the extent of the devastations caused, especially by Katrina. The next time around, why not invite such sisters (and brothers, too) for a swing while they're still young... and bump them off in the backyard itself?

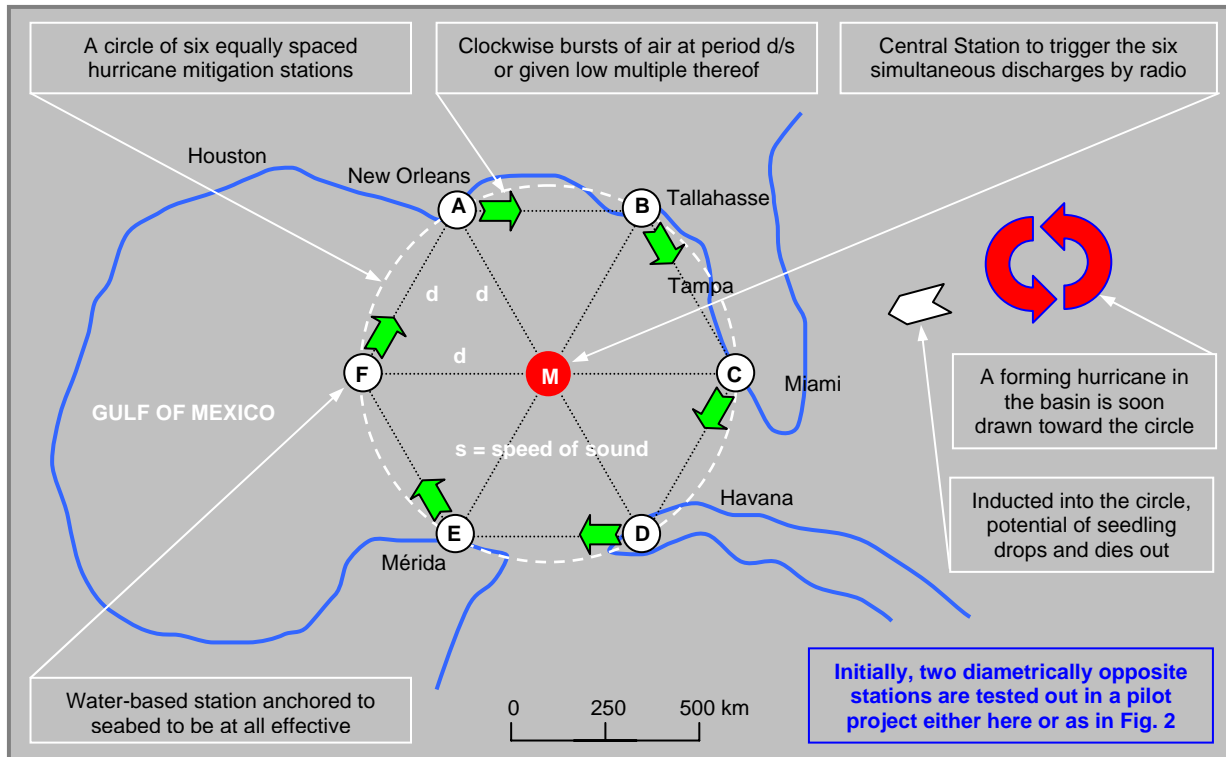


Fig. 1. An ideal setting for six hurricane mitigation stations, A to F, for the Atlantic basin.

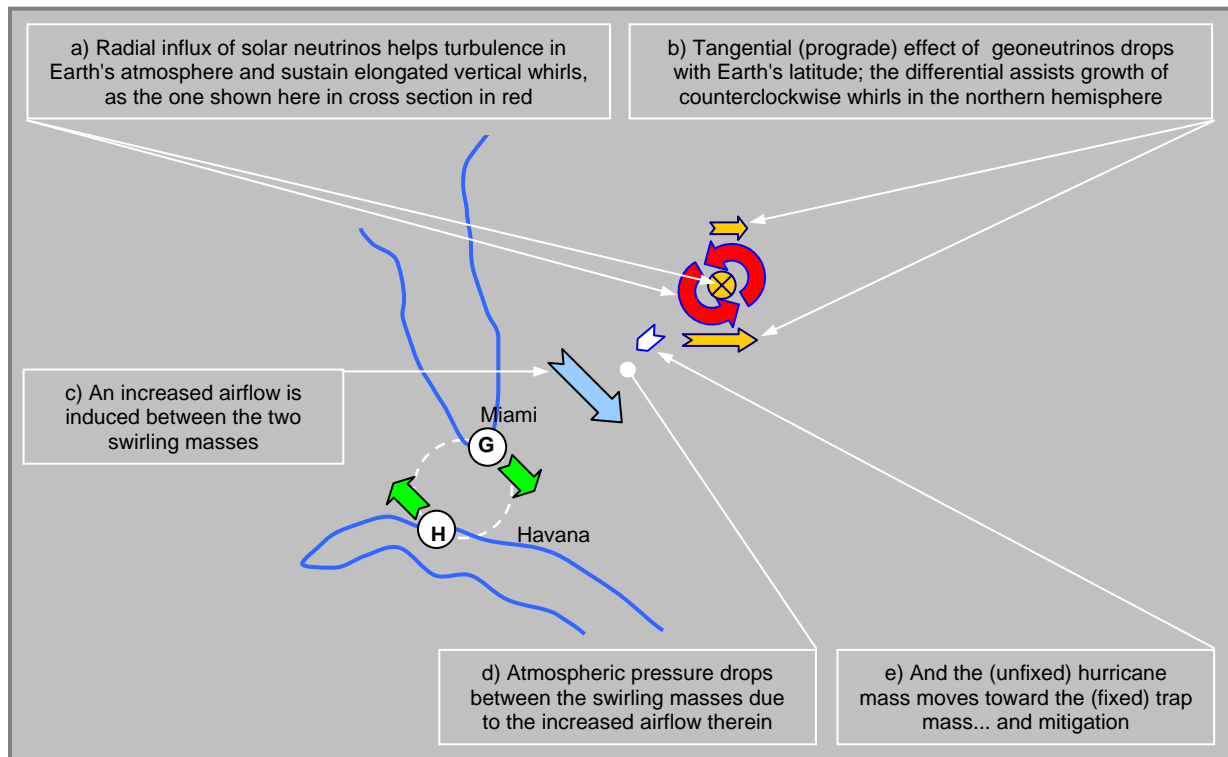


Fig. 2. The setting for two stations, G and H, for initial testing.

The Battle of New Orleans II

Fig. 1 shows an ideal setting for six stations, A to F, in this part of the Atlantic basin. These non-nuclear “artillery” centers are equally spaced, as much as practicable, around the circumference of a circle and in a clockwise sense. The stations are equipped to simultaneously detonate and explosively displace the maximum possible air mass at equal time intervals in a given horizontal direction (shown by the green arrows in Fig. 1). National Aeronautics and Space Administration’s (NASA’s) rocket boosters, which do indeed throttle and reverberate the entire environment even visibly for miles around (25), is a good and ready one to initially test with.

A new-generation rocket fuel, made from – believe it or not – candle wax, is presently undergoing tests at NASA’s Ames Research Center (26). What better way is there to field test this environmentally friendly fuel material, known as – again, believe it or not – hurricane candles, than at these ‘hurricane’ stations? Safer to handle and better for the environment than today’s solid rocket fuels, this modern twist on the ancient hurricane candle could someday beckon young hurricanes and chart them out of harm’s way for humanity.

The Federal Emergency Management Agency (FEMA), the Board on Natural Disasters (BOND), the National Oceanic and Atmospheric Administration (NOAA), the Department of Defense (DoD), NASA, and others could then put their heads together to come up with plans for the final installations and their locations.

The rhythmic period, t , of discharge of the ‘cannons,’ simultaneously at the six stations, may be taken as,

$$t = d/s, \tag{1}$$

or a simple multiple thereof (the lowest practicable, to ensure sustain for the intended effect);

where d is the spacing between stations (Fig. 1) and s is the average speed of sound at the time between stations.

The most efficient way, perhaps, is to have a central monitoring station, M (or a seagoing vessel at M), as shown in Fig. 1, which would also trigger the simultaneous discharges at the outer stations by radio control, with t predetermined for a set of firing.

To get an idea of this repeat discharge period, t , let us consider the following typical values.

Average distance between stations, $d = 500$ km.

Average speed of sound between stations, $s = 344$ m/s.

Hence, using Eq. (1),

Time period between discharges, $t = [500 \times 1000 / 344] / 60 = 24.22$ minutes

However, the exact period, t , should be determined in the field and the firings sustained at t until the hurricane threat is diminished to within safe limits.

Stormy Weather

At least two stations at diametrically opposite points, say, A and D or B and E (Fig. 1), should be initially tested out during stormy days to see the extent of the desired changes in the weather map, however feeble the effect but consistent with the continued 'drumming' from the stations. Additional stations can then be commissioned to improve on the results during such overcast days in the basin. Any sea-based stations should be (buttressed and) rigidly anchored to the seabed to be at all effective.

Alternatively, G and H, in Fig. 2, may be tried out as a diametrically opposite pair in a smaller

(imaginary) circle. The direction of fire here, of course, will be perpendicular to the line GH and clockwise in sense. (Here, too, coincidentally, the period will be approximately 24 minutes.)

Discussion and Conclusion

The first question that is likely to be raised here is: “Why hasn’t someone thought of this before?” The answer may be traced to the simple fact that even if someone had, it would have failed to result in any meaningful outcome due to lack of a solid theoretical basis. However, most redeemingly here to humanity, that foundational insight has since been achieved; one that hasn’t even been speculated before in the science mainstream.

In this final quantum mechanical perspective on the nature of things, we see the atom in vibrant communion with all of the other atoms near and far removed. The empirical data gathered painstakingly by dedicated researchers of that esteemed yet highly conservative mainstream, no less, have now thrown enough light on this “nonlocality” for even an outsider (equally dedicated, though) to take a step back and see the bigger picture: Everything is connected to everything else across the realm of physics. Thus, controlling hurricanes at the formative stages even from hundreds of kilometers away becomes a distinct possibility and a viable proposition. To ignore or downplay it would now be the *more costly option*; and not justifiable anymore in giving killer hurricanes free range.

What’s more, it doesn’t entail the daunting task of going after the twisters individually, considering the fact that hundreds of potentially lethal ones are formed each year and that, too, spread over thousands of square miles. Instead, the eddies are neutralized or made less potent from a fixed central location, to which clinic they would spontaneously respond and flock for the treatment, some getting it even en route!

It must also be noted that industrial and other man-made air pollutants can only be a secondary factor with regard to hurricane strengths. Nevertheless, locally and over short periods of time, increased use of fossil fuel, for example, could still be hazardous to life in general. Over the long haul of decades, on the other hand, such pollution would get “thinned out” into outer space, with Earth replenishing the atmosphere from within, and the Sun from without, to maintain Earth’s statistical eco-balance in this present epoch of steady state of the solar system. (In oblivion of these fundamental facts, artificially creating an atmosphere on the Moon or Mars, for instance, would be science fiction and never a viable venture.)

In final conclusion, hurricanes are generally seeded and nurtured by neutrinos from the Sun and Earth together. Earth’s atmospheric vortices are primarily caused and sustained by the neutrinos of the solar wind, and growth facilitated by neutrinos predominantly from the Earth’s core-mantle boundary. Neutrinos affect every single atom in their path; their effect, therefore, can be countered to a good extent by an artificially amassed quantity of matter. The devastating strengths that hurricanes attain can invariably be linked to increased Earth-core and/or solar activity. Blaming them on other causes, like global warming, can only be acceptable as secondary factors to the final toll. The sooner we have the greatness of mind to accept and get these under our hats for some serious and unbiased rethink, discourse, *and* action, the sooner will mankind be out of the woods (and levees!). And the Mardi Gras will once again come to town in all its glory, regalement, and splendor.

References

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2. “Cyclones may affect each other's trajectories even if thousands of kilometres apart.”
Typhoons have long-distance contact
<http://www.nature.com/news/2005/050207/full/050207-6.html>.
3. www.sittampalam.net/MassEnergy.htm, with journal and other references therein.
4. “Using a sophisticated method of analysis, [the Ulysses scientists] found a large number of tones corresponding with those identified by solar observers. Tones cluster around wave periods of about five minutes, Thomson said. Each five-minute period represents the time it takes for the Sun's motion to change from moving outward to moving inward and then back outward again. These waves are equivalent to normal sound waves traveling through the Earth's atmosphere, but the periods are too long for the human ear to hear.”
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10. <http://www.sittampalam.net/TheAntineutrinoDebut.htm>, with journal and other references therein.
11. <http://www.sittampalam.net/AntiGravity.htm>, with journal and other references therein.
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understood electron beams in Jupiter's magnetosphere^{7, 8}, demonstrate that anti-planetward acceleration is a universal feature of aurorae.”

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