

FUTURE ENERGY ***Annual*** ***2006***

featuring

Highlights from Future Energy eNews 2005

&

IRI Annual Report for 2005

Thomas Valone, Editor



CREDITS

**Integrity Research Institute wishes to acknowledge the following sources for
this IRI Member's Annual Report**

Discovery News

New York Times

E – The Environmental Magazine

New Scientist

Nature

IEEE Spectrum

National Geographic

Technology Review

Washington Post

EE Times

**Integrity Research Institute
5020 Sunnyside Avenue, Suite 209
Beltsville MD 20705
202-452-7674**

A nonprofit 501(c) 3 corporation

www.IntegrityResearchInstitute.org

Table of Contents

IRI OFFICERS AND DIRECTORS - 2006 4

President’s Letter..... 5

INTEGRITY RESEARCH INSTITUTE HIGHLIGHTS 2005..... 6

Energy Inventions Advocated by Integrity Research Institute..... 8

A Visit To The California Desert To See The Integratron 9

ARTICLES & PAPERS 13

Multi-Rotor Orbiting Homopolar Device 14

Meditation Gives Brain a Charge, Study Finds 19

The Daintiest Dynamos 22

Spray-On Solar-Power Cells Are True Breakthrough..... 29

Tesla’s Legacy of Electromagnetic Healing Devices 31

10 Simple Ways to Save Energy 32

Scientists Claim Nuclear Fusion in Tabletop Test 33

Physicists Look To Crystal Device For Future Of Fusion 34

Electrogravitics Becomes Validating..... 36

Possible Declassification of Propulsion Technology..... 37

It’s Getting Cheaper to Tap the Sun..... 39

English Words Identified on a Triangular Craft..... 42

Gigahertz Stimulates DHEA in Elderly Patients 44

What Lies Beneath the Void..... 45

Powdered Metal: The Fuel of the Future 46

Study: Human Hands Emit Light..... 51

IBM Claims Better LED 53

IRI OFFICERS AND DIRECTORS - 2006

Officers



**Thomas Valone
President**



**Wendy Nicholas
Secretary**



**Jacqueline Panting
Executive Director
Treasurer**

BOARD OF DIRECTORS

Thomas Valone, PhD

Wendy Nicholas, PE

Jacqueline Panting, ND

ADVISORS TO THE BOARD OF DIRECTORS

Scott Chubb, Ph.D

Elliot Maynard, Ph.D

Peter Hunt, MBA

John Powers, Ph.D

Beverly Rubik, Ph.D

Jeff Norris, MBA

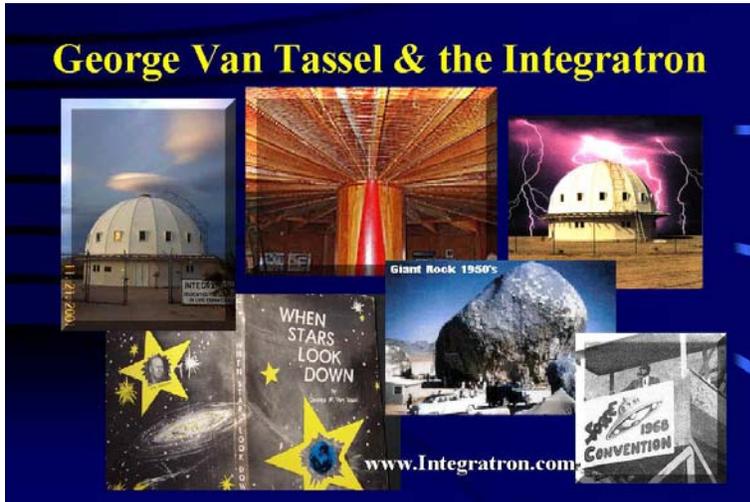
Mitchell Swartz, MD, PhD

Ivan Kruglak

Phoebe Pfaeler

President's Letter

Looking at the accomplishments of 2005 for this *Future Energy Annual Report 2006* is a wonder because of the new and exciting adventures we experienced. Seeing the historic and mysterious Integratron for the first time answered a lot of questions for me about George Van Tassel and his quest for a rejuvenation chamber. It seems that the building could be completed



with a primary coil around the central column and with some insulated wire as the secondary pancake coil under the second floor. I submitted a letter of recommendations to the owner Joanne who also has an engineer that works with her. To the left is a collage that I prepared with some of their website images and George's book cover that inspired me to investigate the structure.

In 2005, we also had the honor of being a part of the National Space

Society's International Space Development Conference (ISDC) here in Washington DC. The cover of our Future Energy magazine had a picture of Jackie behind the IRI booth. An article transcribing my very poignant conversation with the Deputy Director of the National Reconnaissance Office is included in this Annual Report and well worth reading. ISDC also gave me an opportunity to have an interview taped which is part of a new two-DVD set for IRI.

Lastly, the 2005 Whole Person Healing Conference also gave me a new experience as a plenary speaker, with a rare honorarium, as well as a first time being a moderator for a panel discussion. Dr. Larry Dossey, famous for his books on prayer and medicine, gave me a memorable bit of praise after my talk on bioelectromagnetics.

Overall, the 2005 work that IRI did has paved the way for the tradition of researching scientific integrity in the emerging energy sciences.

Sincerely,

Thomas Valone, PhD, PE
President

INTEGRITY RESEARCH INSTITUTE HIGHLIGHTS 2005

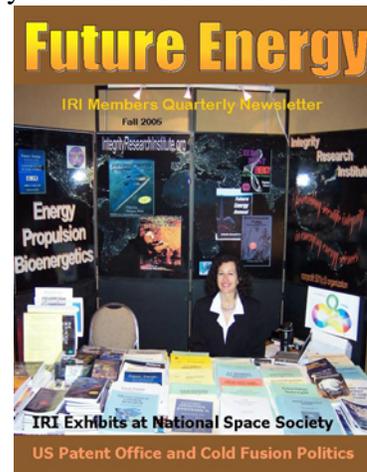
- Bioelectromagnetics Program.** IRI continued to be very busy in 2005 researching bioelectromagnetics and participating in conferences all over the country. Most notable was the “*Whole Person Healing Conference and Qigong Annual Meeting*” sponsored by *Penn State Materials Science Research Dept, The International Qigong Association and Friends of Science*. The conference took place at the Bethesda Holiday Inn in May, 2005. Dr. Valone gave a plenary presentation on the history of



bioelectromagnetics and also was Moderator and Chair for the Panel Discussion that took place on Saturday. Eminent scientists in this field were present, including Larry Dossey, MD Guy Obolensky, Dr Bart Flick and Dr Rustum Roy. In August, IRI board members visited the famous “**Integratron**” (Valone stands in front of it on the left) out in the desert near Giant Rock in Southern California. An impressive building that was started by Mr. Van Tassell following the directions of extraterrestrials, with the purpose of giving health and longevity remains unfinished. The building is currently owned by two extraordinary critical care nurses who

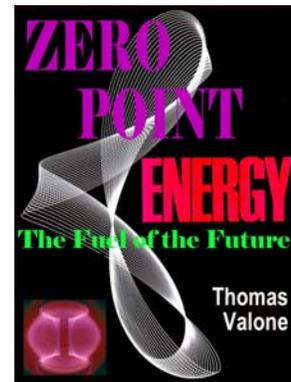
have made several repairs and improvements and who make it available to the public for weekend retreats. Look for our exclusive article in latter pages of this report.

- Future Energy Program.** IRI continued to research and promote future energy technologies. We were pleased that our *Future Energy Annual Report* has become a favorite to many of our supporters, who look forward to it every year. It is free to our members and available to the public for only \$10. The Report is complete with our Highlights, Financial Reports and selected articles. Another first was the publication of our *IRI Publications and Product Catalog* in full color 20 pages filled



with our books, reports, DVD's CDs Videos and bioelectromagnetic products *Future Energy eNews*, the monthly electronic newsletter, which is distributed free of charge, continues to grow in popularity with over 4,000 subscribers worldwide.

- **Zero Point Energy Program.** IRI continued to research the latest findings and papers on Zero Point Energy. The overwhelming response to the “Practical Conversion of ZPE” book has been really encouraging and has become our bestseller. The layman’s version of the “Zero Point Energy Feasibility Study” was proposed in 2005 and titled *Zero Point Energy, The Fuel of the Future*. It took two years to complete for our online catalog and release to the public in the Spring of 2007.



- **Dr Andrija Puharich Preservation Project.** IRI continues to preserve the laboratory notes and works of the great physician and scientist, Andrija Puharich, M.D. relating to his seminal research on the origin of life creation of amino acids from basic electrolytes which included transmutation of elements. An American as well as Japanese firm, are now replicating his experiments.

- **Lecture Appearances.** IRI officers kept very busy in 2005. There were many conference



presentations along with exhibit booths that helped educate the public and professionals on emerging energy technologies and groundbreaking theories such as Zero Point Energy, Electrogravitics and Bioelectromagnetics. A milestone was Dr Valone’s presentation at the National Space Society Conference in Washington DC. With appearances by Astronauts Rusty Swieckert, Buzz Aldrin, and Space Tourism

heavyweights Burt Rutan and Peter Diamondis, it was a thrilling conference. (Valone talks with billionaire Peter Diamondis above.) Another appearance was at the United States Psychotronics Association www.psychotronics.org where the latest findings on future energy and propulsion was presented. Also, presentations were done at the Tesla Tech Conference in Salt Lake City regarding “antigravity and propulsion, and a presentation at the Twenty Third IUOFC Conference in Laughlin, Nevada, regarding Magnetic Motors Applications.

Energy Inventions Advocated by Integrity Research Institute

- 1) **FocusFusion.org** – Controllable hot fusion project that is compatible with electricity extraction. Makes the Tokamak obsolete. Eric Lerner has already achieved the necessary billion-degree threshold demanded by nuclear physics while funded by a small NASA grant. An environmentally safe, abundant energy source: decaborane. Hydrogen-boron fusion uses a plasma focus device. A recent simulation confidently predicts the LPP reactor can reach break even at 1.5 MA (MA = megamps = million amperes) and produce net energy at 2 MA. Low risk and high payback. Contact: Eric Lerner, Lawrenceville Plasma Physics, 973-736-0522, email: elerner@igc.org or Dr. George Miley, U of Illinois, email: GHMiley@uiuc.edu
- 2) **Pre-Seismic Earthquake Predictor & Triangulator** – Patented invention (US Patent #4,724,390) by a university physics professor, provides days of advance warning before a major earthquake or volcanic eruption. Published in several journals, texts and conference proceedings, the T-1050 has had several trials and successful predictions of earthquakes. Contact Dr. Elizabeth Rauscher, 480-982-2285 email: FlyingWG@msn.com
- 3) **Magnetic Energy Converter (MEC)** – A robust power-generating device that can produce electricity and a propulsive force. Business plan brings this amazing invention to market within three years. The MEC converts a known energy source that quantum physicists call zero point energy (ZPE), into conventional electromagnetic energy, which can be harnessed as electricity, used to turn wheels, turbines, etc. Inventors Godin and Roshchin (US patent #6,822,361) have published several journal articles, with proof-of-principle prototypes to their credit. Contact Ivan Kruglak, 818-681-0091 email: ivan@ionsky.com, website: www.ep-systems.net
- 4) **Wireless Electric Power Transmission** – Over 10 years of experimental and theoretical work by university professor that confirms all aspects of this revolutionary invention, pioneered by Nikola Tesla. Two articles reprinted in Valone's *Harnessing the Wheelwork of Nature* by the inventors describe more details of the safe and highly efficient (95%) electricity transmission method. Contact Dr. James Corum, 304-291-0466 email: jcorum@ieee.org
- 5) **Russ George - Planktos** – Presented at COFE2, this project has proven its ability to create artificial algae blooms. The purpose is to absorb literally thousands of tons of carbon dioxide and send it to deep storage at the bottom of the sea, as the algae dies. Planktos offers probably the only solution to global warming by attacking the problem directly as new energy sources slowly become available. The website also offers certified carbon credits based on this algae seeding. email: russ@planktos.com website: www.planktos.com
- 6) **Electrotherapy Teslatron** – Installation in a CA clinic of a successful million volt Tesla coil therapy machine in a room-size treatment protocol for stubborn and terminal disease patients. Several medical doctors routinely work with this inventor and send patients for treatment. 10-patient study ongoing. Contact Guy Obolensky, 845-753-2782 email: soliton@optonline.net
- 7) **EM-Probe.com** – Pocket-size magnetic pulser developed by a medical doctor who cured himself of congestive heart condition. DVD available from IRI featuring Dr. Gordon. The EM-Pulse is endorsed by doctors and the subject of a NASA four-year study. Contact Glen Gordon MD, 360-297-8736 email: DrGordon@em-probe.com website: www.em-probe.com
- 8) **Transformative Energy Projects:** (1) *Spiral Magnetic Motor* which uses a magnetic gradient to achieve torque. The motor can be configured into a car motor which will use voltage without current to spark each cycle. The finished prototype will be incorporated into a Bitterly Flywheel vehicle for a followup Phase II project. No fuel is required since the increasing magnetic attraction (gradient) performs useful work. A microturbine powered by magnets is another spinoff project. (2) *Electricity-Generating Shock Absorber* for electric cars that can be prototyped within an 18-month period. (3) *Zero Point Energy* solid-state diode electricity generator rectifying vacuum fluctuations, which can be mass-produced into panels similar to LED panels for TV and video. (4) *Planetary Protector* for incoming meteors, tsunami amelioration, and tornado/hurricane dispersion, uses a Podkletnov projectable gravity impulse device. Journal articles published on collimated beam experimental results. Contact Dr. Thomas Valone, email: iri@erols.com
Integrity Research Institute, 202-452-7674, 301-220-0440, 800-295-7674

A Visit To The California Desert To See The Integratron

Jacqueline Panting, N.D.



THE INTEGRATRON

The Integratron is the creation of Astronautical Engineer and test pilot, Mr. George Van Tassel, He based on the design of Moses' Tabernacle, the writings of Nikola Tesla, Georges Lakovsky bioelectromagnetic machines and telepathic directions from extraterrestrials. This one-of-a-kind building is a 38-foot high, 55-foot diameter, non-metallic structure originally designed by Van Tassel as a rejuvenation and time machine in the 1970's. Today, it is the only all-wood, acoustically perfect sound chamber in the U.S. (photos by Tom Valone)

It was a real sunny California afternoon. We left the hustle and bustle of Los Angeles and headed west to see the famous building, created by George Van Tassell known as “The Integratron.” On the way, we enjoyed the unusual views of the California desert. Although hot, about 110 degrees, the dry air was very welcome by us, after enduring the heavy humidity of our home in the East Coast. Picturesque adobe homes and typical desert trees adorned the landscape. About 30 minutes away from the Integratron, we got to see one of the largest wind farms in the world. It was a very impressive sight indeed! Hundreds of huge white columns with their windmills moving at the wind’s melodious pace. To know that so much energy was being produced in an ecological friendly manner was refreshing.



We continue on our way to Landers, and finally arrived at “The Integratron”. Seeing this beautiful building for the first time was very thrilling. Up till now we had seen many pictures, artist’s drawings and slides. But to finally see it with our own eyes was a very special feeling. A perfectly round, winter white building etching the dessert landscape. What a peaceful spot, so quiet and relaxing, all you can hear is the wind blowing softly. We were met by Joanne who currently owns with her sister the whole property. They are to be commended for all the repairs and improvements they have made! The building is now in almost perfect condition. She



was a most gracious and generous host, who showed us the whole building as well as gave us precious tidbits of information regarding Van Tassell and the Integratron.

As we entered the building, you could see the walls covered with Van Tassell memorabilia of all kinds. Historical posters, pictures of Van Tassell and lovely esoteric paintings. In the middle of the room stands a huge column reminiscent of a Tesla coil with windings, instantly giving away the fact that this building was built with bioelectromagnetic principles for healing.

To give some background information, George Van Tassel, creator of the Integratron, was an aeronautical engineer and test pilot who worked for Lockheed, Douglas Aircraft and alongside Howard Hughes at Hughes Aviation . He was also one of the leaders in the UFO movement who

held annual "Spacecraft Conventions" at Giant Rock for 25 years. Van Tassel said UFO channelings and ideas from scientists such as Nikola Tesla led to the unique architecture of the

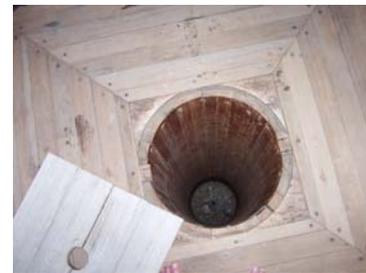


Integratron. He spent 18 years constructing the building. Although he knew he would not live to see the building completed he kept on until the day he died, telling everyone that the ET's would return to finish it.

He moved with his family to Giant Rock in 1947. He leased four square miles of land from the government, including Giant Rock, a 7-story high, freestanding boulder formerly sacred to the Native Americans who lived in the area. He began conducting weekly meditation sessions in 1953 in the rooms underneath Giant Rock which, he

claimed, led to UFO contacts and finally to an actual encounter with extra-terrestrials when, in August of that year, a saucer landed, woke Van Tassel up and invited him onto the ship. There the aliens gave him the technique for rejuvenating living cell tissues. In 1954 he and his family began building a structure they called The Integratron to perform the rejuvenation. George described his creation this way, **"The Integratron is a machine, a high-voltage electrostatic generator that would supply a broad range of frequencies to recharge the cell structure."**

According to Van Tassel, the Integratron is located on an intersection of powerful geomagnetic forces that, when focused by the unique geometry of the building, will concentrate and amplify the energy required for rejuvenation and healing. In 2005, a geophysicist measured the earth's magnetic field for up to 15 miles in every direction from the Integratron and then inside the dome. She proclaimed that there is a significant, unexplainable spike in the earth's magnetic field in the center of the Integratron.



SOUND VORTEX

We can testify that just entering the building, you feel energy flowing immediately through your body. The most impressive part of the building is the upper chamber. Perfectly round, the wood used was pressed and place to keep its perfect shape with no nails. In the middle of this upper room is a sound vortex that you cannot deny, which reflects all sound back to the person in the center. Many people come and rent the Integratron for the weekend, just to experience its sound and healing properties . Joanne has set up the room so cozy, with Navajo blankets and mattresses placed surrounding the sound vortex



She also uses the crystal sound bowls to heighten the healing experience.

nor.

After spending several hours examining records, taking pictures and talking, we decided to go to Giant Rock, which is only about 15 minutes from The Integratron. As we walked to our car, Joanne was very gracious in giving us a whole bunch of grapes that grow on the property. She told us that they are full of energy and healing properties since they grow on the magnetic vortex. We are happy to say that we had them just breakfast in our hotel room for the next couple of days and felt very energized after eating them.

We want to heart fully thank Joanne for making special arrangements to meet with us and give us such a delightful tour of this magnificent building and for her generosity in allowing us to take pictures, see the many documents and gives us lots of historical data.



Plaque honoring Mr George Van Tassel and his Integratron, erected by the Billy Holcomb Chapter of the Clampus Vitus Society in association of the Morongo Basin Historical Society

For further information: Send correspondence to: PO Box 3461, Landers, CA 92285
 Street Address: 2477 Belfield Boulevard, Landers, CA 92285
 Phone: 760-364-3126 Email: integratron@gmail.com

ARTICLES & PAPERS

Including

Highlights of

Future Energy eNews

Multi-Rotor Orbiting Homopolar Device

Energy patent drafted by Valone at IRI for inventors - from *Future Energy eNews*, Jan., 2005

S. Godin and V. Roschin, US Patent #6,822,361, Nov. 23, 2004

<http://12.espacenet.com/espacenet/viewer?PN=US6822361&CY=gb&LG=en&DB=EPD>

Back in 1831, Michael Faraday discovered that a cylindrical magnet suspended by a string and touching a mercury bath at the bottom could generate electricity while spinning along its axis if a second electrical contact was made at the periphery of the midpoint of the magnet. His experiment was a one-piece homopolar machine since the magnet and conductor were joined together. Such Faraday generators have also been called acyclic, unipolar or homopolar generators because no commutation or alternating of the magnetic poles is necessary for this machine in order to generate electricity. The type of electrical output is most often direct current (DC) unless specific means are designed to provide an interruption of radial conduction and thus simulate alternating current (AC). Historically, DC was championed by Thomas Edison during the early part of the 20th century while at the same time AC was championed by Nikola Tesla and George Westinghouse. In the future, DC will be coming back into style with the emergence of ambient temperature superconductive cables. Therefore, highly efficient homopolar generators will be in demand to meet the market demand for electricity.

Homopolar generators usually have a single disk or drum rotating in a stationary magnetic field with sliding contacts. The sliding contacts often present high resistance however. The construction and operation of homopolar machines for electric propulsion of marine vessels or railguns for example is already well known. Such machines include motors and generators wherein electrical current flows through a conductor situated in a magnetic field during rotation of the machine rotor. In the case of a homopolar motor, the current will develop a $\mathbf{J} \times \mathbf{B}$ force perpendicular to the direction of its flow through the conductor and that of the magnetic field. In the case of a homopolar generator, a voltage dependent on the rotational speed, magnetic field, and radius, is induced in a conductor moving within the magnetic field. When current is drawn from the homopolar generator, it also develops a $\mathbf{J} \times \mathbf{B}$ force for the same reason as with the motor but is referred to as back torque or armature reaction. General reference information including basic principles used to reduce back torque can be found in *The Homopolar Handbook* by Thomas Valone (ISBN 0-9641070-1-5).

The prior art rarely includes a one-piece homopolar machines that rotate the magnet with the disk. Even more unknown is the concept of rolling contacts. Eliminating sliding contacts is shown in the "Planetary Homopolar Generator," *IBM Technical Disclosure Bulletin*, Vol. 17, No. 6, p. 1786-87, Nov., 1974, H. D. Varadarajan. Using a conducting belt or rolling contacts to gather current from a magnetic field flux cutting rotor, there is an annular magnetic field through which the rotor executes a planetary motion. The large stresses resulting from the centrifugal force of the massive, unbalanced planetary rotor is a distinct disadvantage, prohibiting high speed operation. Thus, only a low rate of rotation is possible with the IBM design.

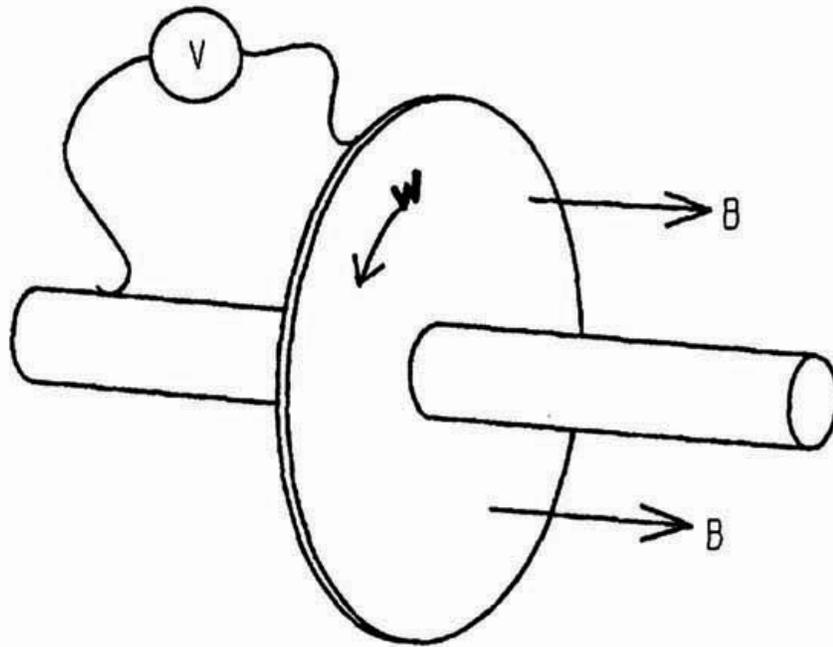


FIG. 1
PRIOR ART

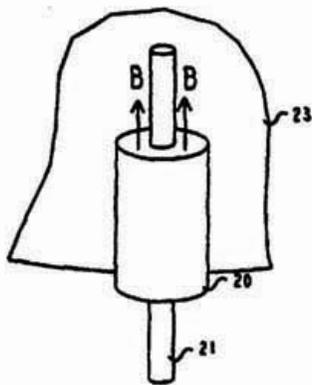


FIG. 2

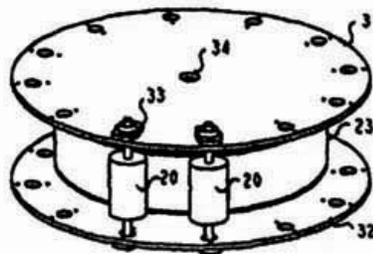


FIG. 3

The "Direct Current Homopolar Machine" U.S. Pat. No. 5,587,618 to Hathaway demonstrates an analogous concept of relative motion between conductive orbiting shaft and a stationary disc-shaped magnetized armature. Science Applications International Corporation claims an obvious conductive belt, dual disk "Homopolar Motor-Generator" in U.S. Pat. No. 5,241,232 to Reed that was already invented as the "Dynamo Electric Machine" of U.S. Pat. No. 406,968, patented by none other than Nikola Tesla in 1889, also with two unipolar magnetized rotors connected by a conductive belt. The belted dual unipolar machines solve one of the problems that plague the field by offering two sliding contacts at the low speed surface on the axle.

However, the present invention requires only one sliding contact on the axle. These conductive belt machines also demonstrate, in principle, the concept of a multi-rotor, planetary design, by the process of coordinate transformation, since relative motion is the key to the operation of a homopolar generator. The concept of rolling contact is demonstrated with the Dalen "Dynamo Electric Machine" U.S. Pat. No. 645,943, where two disks are turning in opposite directions while in contact with each other at their periphery. However, the axle of each disk must remain fixed in place whereas each axle is in orbiting motion in the present invention. The Roshchin machine Russian Pat. No. 2155435 contains a basic concept of magnet rotors orbiting a circular stator but does not include the intimate electrical contact necessary to utilize the homopolar generation of the present invention or to initiate a homopolar motoring effect.

Homopolar machines can reversibly function as motors as well such as flywheels and used as energy storage devices. First used in transportation applications in the 1950's, flywheel powered buses were designed to have the flywheel accelerated at every stop. Composite rotors currently have been developed which can spin at very high revolutions (100,000 revolutions per second); and the speed is limited by the tensile strength of the rim of the rotor. By using a multi-rotor design, the centrifugal forces of a large disk can be greatly reduced and still maintain high energy storage or production. By using magnetic bearings, the friction on the axis of the rotor can be reduced sufficiently so that such rotors can maintain most of the energy for several days. Electricity can then be tapped, as with a battery, on demand.

The IBM Varadarajan planetary rotor is unbalanced and has a low rate of magnetic flux cutting due to its annular magnetic field design. The Hathaway direct current machine has unbalanced conductive material orbiting the central magnetized disk which limits the rotational speed. The conductive belt designs can be subject to oxidation and slippage, even requiring a toothed timing belt on each axle as well. With most disk models of homopolar generators, as opposed to drum designs, sliding contacts are the single most important contribution of resistance inhibiting the power output of the machine. Internal resistance is the only limit to the output capability of a homopolar generator and it is important to reduce all sources of internal resistance to obtain maximum power output for a given input torque. Rather than use high resistance carbon brushes, medium resistance silver-graphite brushes or dangerous conductive liquids such as mercury, low temperature solder, or sodium-potassium, there is a need to eliminate frictional sliding contact at the high speed periphery of the magnetized rotor completely. Furthermore, rather than maintaining two sliding contacts which contribute friction and resistance, even in the rolling and

belted designs, there is a need to cut the number in half to only one high current sliding contact. The present invention satisfies both of these needs.

Summary of the Invention

The primary object of the invention is orbiting multi-rotor cylindrical magnets in rolling contact that eliminates friction while generating DC electricity.

Another object of the invention is to provide high efficiency, low noise and low resistance in a high generator.

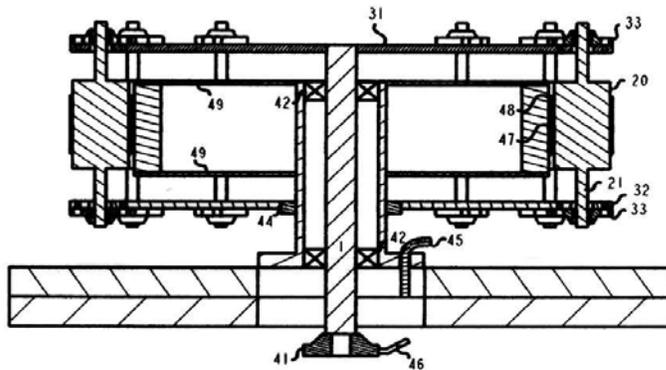


FIG. 4

Another object of the invention is that it uses readily available materials in a dynamically balanced arrangement.

A further object of the invention is safety through reduced internal stress than comparable homopolar machines with a single rotor.

Yet another object of the invention is that it provides distributed generation around an air core.

Other objects and advantages of the

present invention will become apparent from the following descriptions, taken in connection with the accompanying drawings, wherein, by way of illustration and example, an embodiment of the present invention is disclosed.

The present invention comprises an improved homopolar machine with dynamically balanced, axially parallel, cylindrical, electrically conductive magnets arranged circumferentially around the vertical axis of central stator ring. Such a design can be referred to as distributed generation since each magnet rotor generates only a fraction of the current that is transmitted through the machine. Thus, the conductive bearings contacting the center of each end of the magnet rotors may carry only one tenth or less of the total current. The multi-rotor homopolar also does not include sliding contacts at each magnetized rotor rim but instead utilizes a suitable rolling means attached separately to magnets and also to the stator ring for intimately contacting and engaging non-slip rolling between magnets and stator as they orbit around the stator. The magnetized rotors maintain rotational synchronism and equal relative position to each other with a bearing means rotatably securing the top and bottom end of each magnet to a corresponding electrically conductive circular endplate. The electrical energy is extracted, or inputted if used as a motor, through contacts on the conductive stator and at the machine's electrically conductive axle located in the center of the machine while rigidly attached to the top circular endplate that rotates with all of the individually magnetized rotors. The only high current, moving contact that is required is a single electrically conductive thrust bearing that supports the central axle. An

insulating thrust bearing meanwhile separates the axle from the center of bottom circular endplate. The stator, which is of course stationary, accomplishes the second contact means through a standard electrical connection with no need for any relative motion sliding contact. The stator may be optionally magnetized in the opposite direction to the magnetized rotors in order to improve the coercive force or magnetic flux density of the rotors by closing the magnetic circuit.

The drawings constitute a part of this specification and include exemplary embodiments to the invention, which may be embodied in various forms. It is to be understood that in some instances various aspects of the invention may be shown exaggerated or enlarged to facilitate an understanding of the invention.

(See below for the rest of patent which is more technical – Ed note)

More information

Experimental Research of the [Magnetic-Gravity Effects](#) with Magnetic Energy Converter (MEC) by [V. V. Roschin](#) and [S. M. Godin](#)

[Roshchin-Godin article about Physical Effects in a Dynamic Magnetic System](#)
(http://users.erols.com/iri/Roshchin_Godin.PDF)

[Summary of MEC Research Proposal](#) (<http://users.erols.com/iri/MECProposal.htm>) - Contact EPS CEO Ivan Kruglak at ivan@ionsky.com for complete proposal

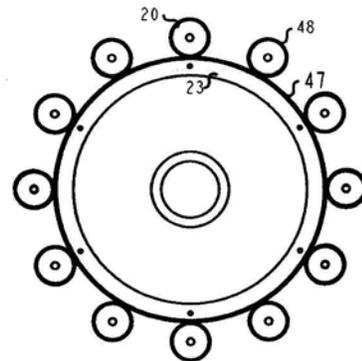


FIG. 5

Mechanical Energy Converter

Summary of Observed Effects by Godin & Roshchin

- Starter motor is disengaged from device
- Generation of self-powered electrical energy up to 7 kW output
- Change of weight of the device averaging 35% loss or gain
- Loss or gain above 200 RPM depends on direction of rotation
- Observation of hysteresis between CW and CCW rotations
- Weight influenced by high-voltage application to electrodes
- Weight influenced by variation of speed & electrical load
- Concentric magnetic and temperature fields up to 15 meters
- Presence of corona discharge with violet light and ozone smell
- Threshold at 550 RPM which exhibits a tendency toward exponential increase in speed with or w/o loading

US Patent and Trademark Office
Website for Patent Number
Search
<http://patft.uspto.gov/netahtml/srchnum.htm>

Google Patent Retrieval Service
(free of charge)
www.google.com/patents

Meditation Gives Brain a Charge, Study Finds

By Marc Kaufman, *Washington Post*, Jan 3, 2005, P. A05

<http://www.washingtonpost.com/wp-dyn/articles/A43006-2005Jan2.html>



Brain research is beginning to produce concrete evidence for something that Buddhist practitioners of meditation have maintained for centuries: Mental discipline and meditative practice can change the workings of the brain and allow people to achieve different levels of awareness.

Those transformed states have traditionally been understood in transcendent terms, as something outside the world of physical measurement and objective evaluation. But over the past few years, researchers at the University of Wisconsin working with Tibetan monks have been able to translate those mental experiences into the scientific language of high-frequency gamma waves and brain synchrony, or coordination. And they have

pinpointed the left prefrontal cortex, an area just behind the left forehead, as the place where brain activity associated with meditation is especially intense.

"What we found is that the longtime practitioners showed brain activation on a scale we have never seen before," said Richard Davidson, a neuroscientist at the university's new \$10 million W.M. Keck Laboratory for Functional Brain Imaging and Behavior. "Their mental practice is having an effect on the brain in the same way golf or tennis practice will enhance performance." It demonstrates, he said, that the brain is capable of being trained and physically modified in ways few people can imagine.

Scientists used to believe the opposite -- that connections among brain nerve cells were fixed early in life and did not change in adulthood. But that assumption was disproved over the past decade with the help of advances in brain imaging and other techniques, and in its place, scientists have embraced the concept of ongoing brain development and "neuroplasticity."

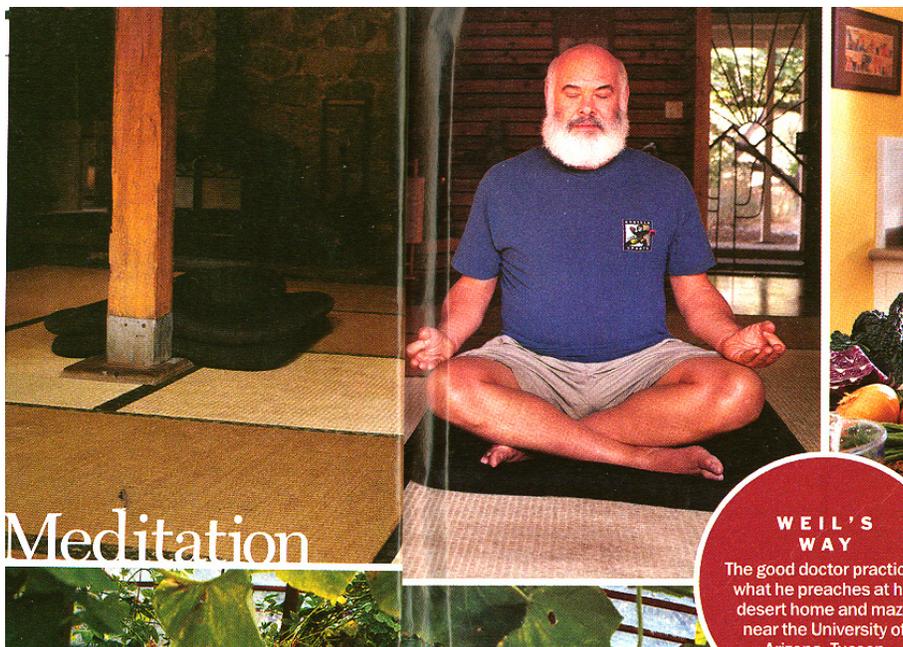
Davidson says his newest results from the meditation study, published in the *Proc. of the National Academy of Sciences* in November, take the concept of neuroplasticity a step further by showing that mental training through meditation (and presumably other disciplines) can itself change the inner workings and circuitry of the brain.

The new findings are the result of a long, if unlikely, collaboration between Davidson

and Tibet's Dalai Lama, the world's best-known practitioner of Buddhism. The Dalai Lama first invited Davidson to his home in Dharamsala, India, in 1992 after learning about Davidson's innovative research into the neuroscience of emotions. The Tibetans have a centuries-old tradition of intensive meditation and, from the start, the Dalai Lama was interested in having Davidson scientifically explore the workings of his monks' meditating minds. Three years ago, the Dalai Lama spent 2 days visiting Davidson's lab.

The Dalai Lama ultimately dispatched eight of his most accomplished practitioners to Davidson's lab to have them hooked up for electroencephalograph (EEG) testing and brain scanning. The Buddhist practitioners in the experiment had undergone training in the Tibetan Nyingmapa and Kagyupa traditions of meditation for an estimated 10,000 to 50,000 hours, over time periods of 15 to 40 years. As a control, 10 student volunteers with no previous meditation experience were also tested after one week of training.

The monks and volunteers were fitted with a net of 256 electrical sensors and asked to



meditate for short periods. Thinking and other mental activity are known to produce slight, but detectable, bursts of electrical activity as large groupings of neurons send messages to each other, and that's what the sensors picked up. Davidson was especially interested in measuring gamma waves, some of the highest-frequency and most important

electrical brain impulses.

Both groups were asked to meditate, specifically on unconditional compassion. Buddhist teaching describes that state, which is at the heart of the Dalai Lama's teaching, as the "unrestricted readiness and availability to help living beings." The researchers chose that focus because it does not require concentrating on particular objects, memories or images, and cultivates instead a transformed state of being.

Davidson said that the results unambiguously showed that meditation activated the trained minds of the monks in significantly different ways from those of the volunteers. Most important, the electrodes picked up much greater activation of fast-moving and

unusually powerful gamma waves in the monks, and found that the movement of the waves through the brain was far better organized and coordinated than in the students. The meditation novices showed only a slight increase in gamma wave activity while meditating, but some of the monks produced gamma wave activity more powerful than any previously reported in a healthy person, Davidson said.

The monks who had spent the most years meditating had the highest levels of gamma waves, he added. This "dose response" -- where higher levels of a drug or activity have greater effect than lower levels -- is what researchers look for to assess cause and effect.

In previous studies, mental activities such as focus, memory, learning and consciousness were associated with the kind of enhanced neural coordination found in the monks. The intense gamma waves found in the monks have also been associated with knitting together disparate brain circuits, and so are connected to higher mental activity and heightened awareness, as well.

Davidson's research is consistent with his earlier work that pinpointed the left prefrontal cortex as a brain region associated with happiness and positive thoughts and emotions. Using functional magnetic resonance imaging (fMRI) on the meditating monks, Davidson found that their brain activity -- as measured by the EEG -- was especially high in this area.

Davidson concludes from the research that meditation not only changes the workings of the brain in the short term, but also quite possibly produces permanent changes. That finding, he said, is based on the fact that the monks had considerably more gamma wave activity than the control group even before they started meditating. A researcher at the University of Massachusetts, Jon Kabat-Zinn, came to a similar conclusion several years ago.

Researchers at Harvard and Princeton universities are now testing some of the same monks on different aspects of their meditation practice: their ability to visualize images and control their thinking. Davidson is also planning further research.

"What we found is that the trained mind, or brain, is physically different from the untrained one," he said. In time, "we'll be able to better understand the potential importance of this kind of mental training and increase the likelihood that it will be taken seriously."

More Information

"Introduction to Modern Meditation, Part II" *Explore*, Vol. 12, No. 1, 2003 by Thomas Valone (article summary)

http://www.explorepub.com/articles/summaries/12_1_valone.html

The Daintiest Dynamos

By Amit LaL & James Blanchard, *IEEE Spectrum*, September, 2004

<http://www.spectrum.ieee.org/WEBONLY/publicfeature/sep04/0904nuct1.html>

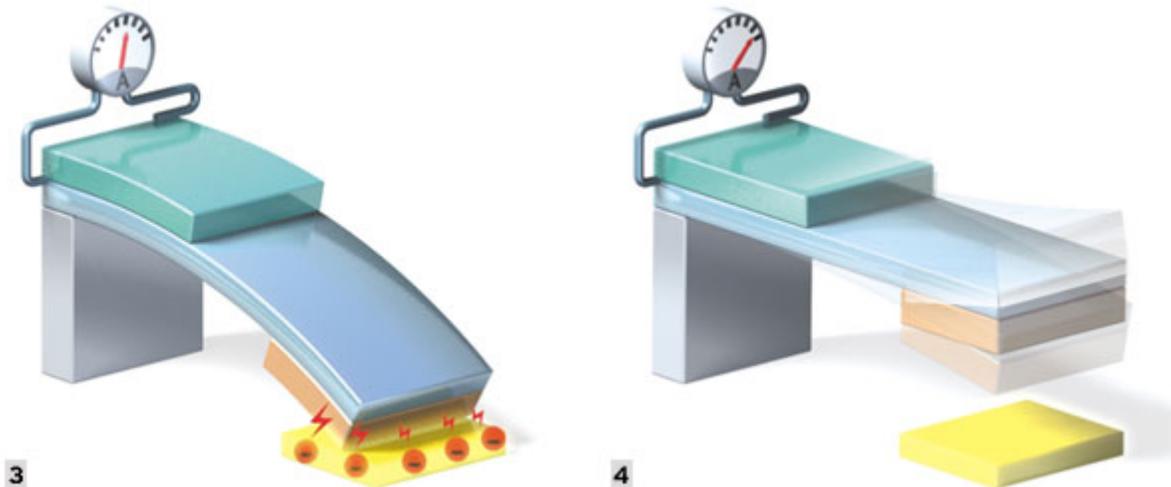
By harvesting energy from radioactive specks, nuclear microbatteries could power tomorrow's microelectromechanical marvels—and maybe your cellphone, too

For several decades, electronic circuitry has been shrinking at a famously dizzying pace. Too bad the batteries that typically power those circuits have not managed to get much smaller at all.

In today's wrist-worn GPS receivers, matchbox-size digital cameras, and pocketable personal computers, batteries are a significant portion of the volume. And yet they don't provide nearly enough energy, conking out seemingly at the worst possible moment.

The reason is simple: batteries are still little cans of chemicals. They function in essentially the same way they did two centuries ago, when the Italian physicist Alessandro Volta sandwiched zinc and silver disks to create the first chemical battery, which he used to make a frog's leg kick.

Now, with technologists busily ushering in a new age of miniaturization based on



microelectromechanical systems (MEMS), batteries have arrived at a critical juncture. MEMS are finding applications in everything from the sensors in cars that trigger air bags to injectable drug delivery systems to environmental monitoring devices. Many of these systems ideally have to work for long periods, and it is not always easy to replace or recharge their batteries. So to let these miniature machines really hit their stride, we'll need smaller, longer-lasting power sources.

For several years our research groups at Cornell University and the University of Wisconsin-Madison have been working on a way around this power-source roadblock: harvesting the incredible amount of energy released naturally by tiny bits of radioactive material.

The microscale generators we are developing are not nuclear reactors in miniature, and they don't involve fission or fusion reactions. All energy comes from high-energy particles spontaneously emitted by radioactive elements. These devices, which we call nuclear microbatteries, use thin radioactive films that pack in energy at densities thousands of times greater than those of lithium-ion batteries [see table, "Energy Content"].

A speck of a radioisotope like nickel-63 or tritium, for example, contains enough energy to power a MEMS device for decades, and to do it safely. The particles these isotopes emit, unlike more energetic particles released by other radioactive materials, are blocked by the layer of dead skin that covers our bodies. They penetrate no more than 25 micrometers in most solids or liquids, so in a battery they could safely be contained by a simple plastic package [see sidebar, "Not All Radioisotopes Are Equal."]

Our current prototypes are still relatively big, but like the first transistors they will get smaller, going from macro- to microscale devices. And if the initial applications powering MEMS devices go well, along with the proper packaging and safety considerations, lucrative uses in handheld devices could be next. The small nuclear batteries may not be able to provide enough electric current for a cellphone or a PDA, but our experiments so far suggest that several of these nuclear units could be used to trickle charges into the conventional chemical rechargeable batteries used in handheld devices. Depending on the power consumption of these devices, this trickle charging could enable batteries to go for months between recharges, rather than days, or possibly even to avoid recharges altogether.

"IT IS A STAGGERINGLY SMALL WORLD THAT IS BELOW," said physicist Richard P. Feynman in his famous 1959 talk to the American Physical Society, when he envisioned that physical laws allowed for the fabrication of micro- and nanomachines and that one day we would be able to write the entire Encyclopaedia Britannica on the head of a pin.

Feynman's vision has finally begun to materialize, thanks to ever more sophisticated microelectronics. Micro- and nanoscale machines are poised to become a multibillion-dollar market as they are incorporated in all kinds of electronic devices. Among the revolutionary applications in development are ultradense memories capable of storing hundreds of gigabytes in a fingernail-size device, micromirrors for enhanced displays and optical communications equipment, and highly selective RF filters to reduce cellphone size and improve the quality of calls.

But, again, at very small scales, chemical batteries can't provide enough juice to power these micromachines. As you reduce the size of such a battery, the amount of stored energy goes down exponentially. Reduce each side of a cubic battery by a factor of 10 and you reduce the volume—and therefore the energy you can store—by a factor of 1000. In fact, researchers

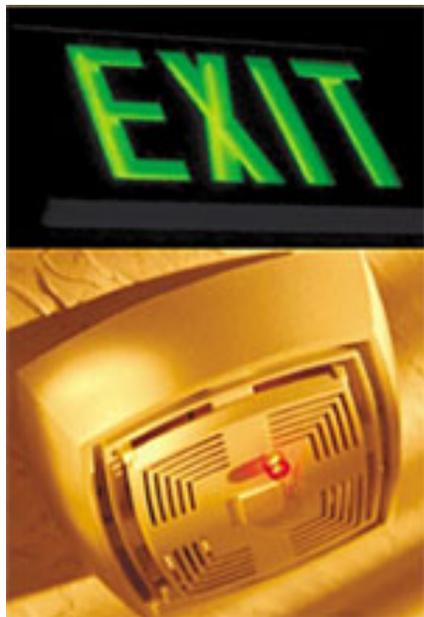
developing sensors the size of a grain of sand had to attach them to batteries they couldn't make smaller than a shirt button.

IN THE QUEST TO BOOST MICROSCALE POWER GENERATION, several groups have turned their efforts to well-known energy sources, namely hydrogen and hydrocarbon fuels such as propane, methane, gasoline, and diesel. Some groups are developing microfuel cells that, like their macroscale counterparts, consume hydrogen to produce electricity. Others are developing on-chip combustion engines, which actually burn a fuel like gasoline to drive a minuscule electric generator.

There are three major challenges for these approaches. One is that these fuels have relatively low energy densities, only about five to 10 times that of the best lithium-ion batteries. Another is the need to keep replenishing the fuel and eliminating byproducts. Finally, the packaging to contain the liquid fuel makes it difficult to significantly scale down these tiny fuel cells and generators.

The nuclear microbatteries we are developing won't require refueling or recharging and will last as long as the half-life of the radioactive source, at which point the power output will decrease by a factor of two. And even though their efficiency in converting nuclear to electrical energy isn't high—about 4 percent for one of our prototypes—the extremely high energy density of the radioactive materials makes it possible for these microbatteries to produce relatively significant amounts of power.

For example, with 10 milligrams of polonium-210 (contained in about 1 cubic millimeter), a nuclear microbattery could produce 50 milliwatts of electric power for more than four months (the half-life of polonium-210 is 138 days). With that level of power, it would be possible to run a simple microprocessor and a handful of sensors for all those months.



And the conversion efficiency won't be stuck at 4 percent forever. Beginning this past July we started working to boost the efficiency to 20 percent, as part of a new Defense Advanced Research Projects Agency program called Radio Isotope Micro-power Sources.

Space agencies such as NASA in the United States have long recognized the extraordinary potential of radioactive materials for generating electricity. NASA has been using radioisotope thermoelectric generators, or RTGs, since the 1960s in dozens of missions, like Voyager and, more recently, the Cassini probe, now in orbit around Saturn. Space probes like these travel too far away from the sun to power themselves with photovoltaic arrays.

RTGs convert heat into electricity through a process known as the Seebeck effect: when you heat one end of a metal bar, electrons in this region will have more thermal energy and

flow to the other end, producing a voltage across the bar. Most of NASA's washing-machine-size RTGs use plutonium-238, whose high-energy radiation can produce enormous heat.

But as it turns out, RTGs don't scale down well. At the diminutive dimensions of MEMS devices, the ratio between an object's surface and its volume gets very high. This relatively large surface makes it difficult to sufficiently reduce heat losses and maintain the temperatures necessary for RTGs to work. So we had to find other ways of converting nuclear into electric energy.

ONE OF THE MICROBATTERIES WE DEVELOPED early last year directly converted the high-energy particles emitted by a radioactive source into an electric current. The device consisted of a small quantity of nickel-63 placed near an ordinary silicon p-n junction—a diode, basically. As the nickel-63 decayed, it emitted beta particles, which are high-energy electrons that spontaneously fly out of the radioisotope's unstable nucleus. The emitted beta particles ionized the diode's atoms, creating paired electrons and holes that are separated at the vicinity of the p-n interface. These separated electrons and holes streamed away from the junction, producing the current.

Nickel-63 is ideal for this application because its emitted beta particles travel a maximum of 21 μm in silicon before disintegrating; if the particles were more energetic, they would travel longer distances, thus escaping the battery. The device we built was capable of producing about 3 nanowatts with 0.1 millicurie of nickel-63, a small amount of power but enough for applications such as nanoelectronic memories and the simple processors for environmental and battlefield sensors that some groups are currently developing.

The new types of microbatteries we are working on now can generate substantially more power. These units produce electricity indirectly, like minute generators. Radiation from the sample is converted first to mechanical energy and then to oscillating pulses of electric energy. Even though the energy has to go through the intermediate, mechanical phase, the batteries are no less efficient; they tap a significant fraction of the kinetic energy of the emitted particles for conversion into mechanical energy. By releasing this energy in brief pulses, they provide much more instantaneous power than the direct-conversion approach.

For these batteries, which we call radioactive piezoelectric generators, the radioactive source is a 4-square-millimeter thin film of nickel-63. On top of it, we cantilever a small rectangular piece of silicon, its free end able to move up and down. As the electrons fly from the radioactive source, they travel across the air gap and hit the cantilever, charging it negatively. The source, which is positively charged, then attracts the cantilever, bending it down.

A piece of piezoelectric material bonded to the top of the silicon cantilever bends along with it. The mechanical stress of the bend unbalances the charge distribution inside the piezoelectric crystal structure, producing a voltage in electrodes attached to the top and bottom of the crystal.

After a brief period—whose length depends on the shape and material of the cantilever and the initial size of the gap—the cantilever comes close enough to the source to discharge the accumulated electrons by direct contact. The discharge can also take place through tunneling or

gas breakdown. At that moment, electrons flow back to the source, and the electrostatic attractive force vanishes. The cantilever then springs back and oscillates like a diving board after a diver jumps, and the recurring mechanical deformation of the piezoelectric plate produces a series of electric pulses.

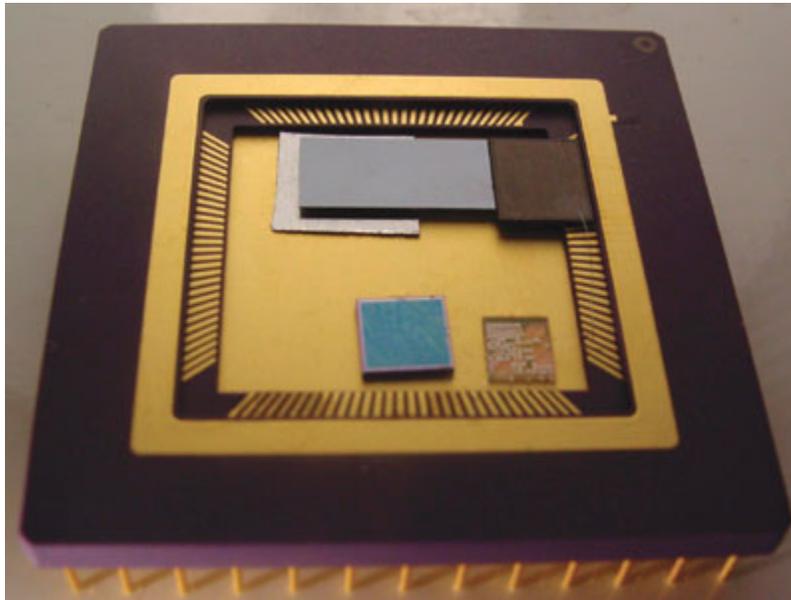
The charge-discharge cycle of the cantilever repeats continuously, and the resulting electric pulses can be rectified and smoothed to provide direct-current electricity. Using this cantilever-based power source, we recently built a self-powered light sensor [see photo, "It's Got the Power"]. The device contains a simple processor connected to a photodiode that detects light variations.

Nuclear batteries can pack in energy at densities THOUSANDS OF TIMES greater than those of lithium-ion batteries

Also using the cantilever system, we developed a pressure sensor that works by "sensing" the gas molecules in the gap between the cantilever and the source. The higher the ambient pressure, the more gas molecules in the gap. As a result, it is more difficult for electrons to reach and charge the cantilever.

tracking
cantilever's
the sensor even
millipascal
low-pressure
like a vacuum

To get the
at a distance,
cantilever work
and emit radio
we could
away—in this
little machine
active" in more
The cantilever,
material with a



Hence, by
changes in the
charging time,
detects
variations in a
environment
chamber.

measurements
we made the
as an antenna
signals, which
receive meters
application the
was "radio
ways than one.
built from a
high dielectric

constant, had metal electrodes on its top and bottom. An electric field formed inside the dielectric as the bottom electrode charged. When it discharged, a charge imbalance appeared in the electrodes, making the electric field propagate along the dielectric material. The cantilever thus acted like an antenna that periodically emitted RF pulses, the interval between pulses varying accordingly to the pressure.

What we'd like to do now is add a few transistors and other electronic components to this system so that it can not only send simple pulses but also modulate signals to carry information. That way, we could make MEMS-based sensors that could communicate with each other wirelessly without requiring complex, energy-demanding communications circuitry.

NUCLEAR MICROBATTERIES MAY ULTIMATELY CHANGE the way we power many electronic devices. The prevalent power source paradigm is to have all components in a device's circuitry drain energy from a single battery. Here's another idea: give each component—sensor, actuator, microprocessor—its own nuclear microbattery. In such a scheme, even if a main battery is still necessary for more power-hungry components, it could be considerably smaller, and the multiple nuclear microbatteries could run a device for months or years, rather than days or hours.

One example is the RF filters in cellphones, which now take up a lot of space in handsets. Researchers are developing MEMS-based RF filters with better frequency selectivity that could improve the quality of calls and make cellphones smaller. These MEMS filters, however, may require relatively high dc voltages, and getting these from the main battery would require complicated electronics. Instead, a nuclear microbattery designed to generate the required voltage—in the range of 10 to 100 volts—could power the filter directly and more efficiently.

Another application might be to forgo the electrical conversion altogether and simply use the mechanical energy. For example, researchers could use the motion of a cantilever-based system to drive MEMS engines, pumps, and other mechanical devices. A self-powered actuator could be used, for instance, to move the legs of a microscopic robot. The actuator's motion—and the robot's tiny steps—would be adjusted according to the charge-discharge period of the cantilever and could vary from hundreds of times every second to once per hour, or even once per day.

THE FUTURE OF NUCLEAR MICROBATTERIES depends on several factors, such as safety, efficiency, and cost. If we keep the amount of radioactive material in the devices small, they emit so little radiation that they can be safe with only simple packaging. At the same time, we have to find ways of increasing the amount of energy that nuclear microbatteries can produce, especially as the conversion efficiency begins approaching our targeted 20 percent. One possibility for improving the cantilever-based system would be to scale up the number of cantilevers by placing several of them horizontally, side by side. In fact, we are already developing an array about the size of a postage stamp containing a million cantilevers. These arrays could then be stacked to achieve even greater integration.

Another major challenge is to have inexpensive radioisotope power supplies that can be easily integrated into electronic devices. For example, in our experimental systems we have been using 1 millicurie of nickel-63, which costs about US \$25—too much for use in a mass-produced device. A potentially cheaper alternative would be tritium, which some nuclear reactors produce in huge quantities as a byproduct. There's no reason that the amount of tritium needed for a microbattery couldn't cost just a few cents.

Once these challenges are overcome, a promising use for nuclear microbatteries would be in handheld devices like cellphones and PDAs. As mentioned above, the nuclear units could trickle

charge into conventional batteries. Our one-cantilever system generated pulses with a peak power of 100 milliwatts; with many more cantilevers, and by using the energy of pulses over periods of hours, a nuclear battery would be able to inject a significant amount of current into the handheld's battery.

How much that current could increase the device's operation time depends on many factors. For a cellphone used for hours every day or for a power-hungry PDA, the nuclear energy boost won't help much. But for a cellphone used two or three times a day for a few minutes, it could mean the difference between recharging the phone every week or so and recharging it once a month. And for a simple PDA used mainly for checking schedules and phone numbers, the energy boost might keep the batteries perpetually charged for as long as the nuclear material lasts.

Nuclear microbatteries won't replace chemical batteries. But they're going to power a whole new range of gadgetry, from nanorobots to wireless sensors. Feynman's "staggeringly small world" awaits.

FOR MORE INFORMATION (appended by IRI)

See [Nuclear Solutions](#) website for details of the "betavoltaic battery" invented by Dr. Paul Brown. Brown's patents include "Layered Metal Foil Semiconductor Power Device" #6,118,204, "Isotopic Semiconductor Batteries" #6,236,812, "Apparatus for Direct Conversion of Radioactive Decay Energy to Electrical Energy" #4,835,433 at www.uspto.gov.

Other nuclear beta particle battery patents include:

- Lucent Technologies' "Self-Powered Device" #5,642,014
- Ohmart's "Radio Electric Generator" #2,696,564, "Radioactive Battery with Chemically Dissimilar Electrodes" #3,019,358 and "Method and Apparatus for Converting Ionic Energy into Electrical Energy" #3,142,254
- Linder's "Method and Means for Generating and/or Controlling Electrical Energy" #2,548,225

Spray-On Solar-Power Cells Are True Breakthrough

Stefan Lovgren, *National Geographic*, January 14, 2005

http://news.nationalgeographic.com/news/2005/01/0114_050114_solarplastic.html

Scientists have invented a plastic solar cell that can turn the sun's power into electrical energy, even on a cloudy day.

The plastic material uses nanotechnology and contains the first solar cells able to harness the sun's invisible, infrared rays. The breakthrough has led theorists to predict that plastic solar cells could one day become five times more efficient than current solar cell technology.

Like paint, the composite can be sprayed onto other materials and used as portable electricity. A sweater coated in the material could power a cell phone or other wireless devices. A hydrogen-powered car painted with the film could potentially convert enough energy into electricity to continually recharge the car's battery.

The researchers envision that one day "solar farms" consisting of the plastic material could be rolled across deserts to generate enough clean energy to supply the entire planet's power needs.

"The sun that reaches the Earth's surface delivers 10,000 times more energy than we consume," said Ted Sargent, an electrical and computer engineering professor at the University of Toronto. Sargent is one of the inventors of the new plastic material.

"If we could cover 0.1 percent of the Earth's surface with [very efficient] large-area solar cells," he said, "we could our energy habits with a clean and renewable."

Infrared Power

Plastic solar cells are not materials are only able visible light. While half of the visible spectrum, the infrared spectrum.



percent of the Earth's efficient] large-area solar in principle replace all of source of power which is

new. But existing to harness the sun's the sun's power lies in other half lies in the

The new material is the first plastic composite that is able to harness the infrared portion.

"Everything that's warm gives off some heat. Even people and animals give off heat," Sargent said. "So there actually is some power remaining in the infrared [spectrum], even when it appears to us to be dark outside."

The researchers combined specially designed nano particles called quantum dots with a polymer to make the plastic that can detect energy in the infrared.

With further advances, the new plastic "could allow up to 30 percent of the sun's radiant energy to be harnessed, compared to 6 percent in today's best plastic solar cells," said Peter Peumans, a Stanford University electrical engineering professor, who studied the work.

Electrical Sweaters

The new material could make technology truly wireless.

"We have this expectation that we don't have to plug into a phone jack anymore to talk on the phone, but we're resigned to the fact that we have to plug into an electrical outlet to recharge the batteries," Sargent said. "That's only communications wireless, not power wireless."

He said the plastic coating could be woven into a shirt or sweater and used to charge an item like a cell phone.

"A sweater is already absorbing all sorts of light both in the infrared and the visible," said Sargent. "Instead of just turning that into heat, as it currently does, imagine if it were to turn that into electricity."

Other possibilities include energy-saving plastic sheeting that could be unfurled onto a rooftop to supply heating needs, or solar cell window coating that could let in enough infrared light to power home appliances.

Cost-Effectiveness

Ultimately, a large amount of the sun's energy could be harnessed through "solar farms" and used to power all our energy needs, the researchers predict.

"This could potentially displace other sources of electrical production that produce greenhouse gases, such as coal," Sargent said.

In Japan, the world's largest solar-power market, the government expects that 50 percent of residential power supply will come from solar power by 2030, up from a fraction of a percent today.

The biggest hurdle facing solar power is cost-effectiveness.

At a current cost of 25 to 50 cents per kilowatt-hour, solar power is significantly more expensive than conventional electrical power for residences. Average U.S. residential

power prices are less than ten cents per kilowatt-hour, according to experts. But that could change with the new material.

"Flexible, roller-processed solar cells have the potential to turn the sun's power into a clean, green, convenient source of energy," said John Wolfe, a nanotechnology venture capital investor at Lux Capital in New York City.

Tesla's Legacy of Electromagnetic Healing Devices

Thomas Valone, Friends of Health and Campaign for Better Health, www.wholepersonhealing.com

Whole Person Health Summit 2005, April 14-17, 2005, Holiday Inn, Bethesda MD

The Whole Person Health Summit to be held on April 14-17, 2005 at the Bethesda Holiday Inn, with sessions devoted to The Structure of Water, Ayurvedic Medicine, Law and Policy, Electromagnetic Healing, Education and Languaging, Spiritual Healing, and Qigong. Larry Dossey, MD, founding editor of *Alternative Therapies*, will be giving the opening plenary talk Thursday night at 7 PM with Congressman Chris Cannon (R, Utah) and Fmr. Rep. Berkley Bedell (D- Iowa), founder of the Nat. Found. for Alter. Medicine.



Future Energy eNews Editor Honored

Thomas Valone, PhD, is being honored as one of the four plenary speakers on Friday, April 15, the opening day of the symposium, on the topic of "Tesla's Legacy: Electromagnetic Healing Devices." In 1898, Nikola Tesla presented his findings of therapeutic uses for his newly invented high frequency Tesla coil oscillator to the eighth annual meeting of the **American Electro-Therapeutic Association**. Thirty years later, in 1932, Dr. Gustave Kolisher announced to the American Congress of Physical Therapy that "Tesla's high-frequency electrical currents are bringing about highly beneficial results in dealing with cancer, surpassing anything that could be accomplished with ordinary surgery." With the historical suppression by the AMA and FDA, most doctors today are unaware of the scientific wealth of techniques for healing with electrotherapy. Recent studies have continued to demonstrate incontrovertible evidence for the benefits of electromagnetic healing devices, for a wide variety of illnesses, with a surprising lack of harmful side effects. The discovery that *electrons are antioxidants*, for example, will change the way we fight free radicals in the future. An overview of the rich history of early devices, thanks to archives of the www.ElectrotherapyMuseum.com, and some of the recent scientific findings, based on the science of bioelectromagnetics, will be presented.

Further Information: calling Meredith Weber at Penn State University, 814-865-2510.

10 Simple Ways to Save Energy

Jennifer Vogel, *E - The Environmental Magazine*,
March 20, 2005, <http://www.emagazine.com/view/?2313>

Saving energy means saving pennies, but some energy-saving techniques such as adding insulation or installing new windows are costly for homeowners and unavailable to renters. Here are 10 inexpensive ways to save energy in your home or apartment without breaking the bank or launching major projects.



1. **Switch to compact fluorescents** for your five most-used lights. Yes, compact fluorescents are initially more expensive (\$2 to \$20) than conventional incandescent bulbs, but some utilities subsidize them and the remaining extra cost is worth it. According to the Natural Resources Defense Council (NRDC), a single compact fluorescent will shave \$60 off your energy bill in its lifetime and keep a half ton of the greenhouse gas carbon dioxide out of the atmosphere. The federal Energy Star program notes that if every household in the nation switched five bulbs, we could shut down 24 power plants. Compact fluorescent bulbs use at least two-thirds less energy and last six to 10 times longer than conventional bulbs—not a bad return on your small investment!
2. **Insulate your windows.** If you don't have double-pane windows and can't afford to install them, consider putting up plastic. Window plastic comes in kits (\$4 to \$6 per window) that are available at most hardware stores, and can be installed easily. According to the U.S. Department of Energy (DOE), the pocket of air created between the plastic and the window serves as insulation, reducing heat loss by 25 to 50 percent.
3. **Don sweaters and fuzzy slippers.** Before turning up the thermostat, ask yourself if you might be just as comfortable putting on some layers. The DOE calculates that your energy bill will go up three percent for each degree you raise the thermostat. Remember that tightly knit clothing is warmer than loose-knit, and wool is warmer than cotton.
4. **Use hot water efficiently.** Install low-flow showerheads and faucet aerators—you'll use less water, so you'll have to heat less water. The DOE notes that a low-flow showerhead reduces the amount of water you must heat by 20 gallons, without reducing the quality of your shower. A \$10 to \$20 showerhead will pay for itself within three or four months. Wash clothes in cold water whenever possible and use the washer only with a full load. Keep your water heater set between 120 and 140 degrees Fahrenheit.
5. **Watch your appliance use.** Everyday appliances siphon huge amounts of energy off the grid, but those with Energy Star ratings use 10 to 50 percent less energy than standard models. When cooking, the NRDC advises consumers to "resist the urge to open the oven door to peek—each opening can reduce the oven temperature 25 degrees." Efficiency Vermont suggests keeping refrigerators at 36 to 38 degrees, and freezers at zero to five degrees. Unplug televisions when not in use, as they will continue to draw power even when switched off. Computers should be set to "hibernate" when abandoned temporarily.

6. **Use blinds and curtains wisely.** In the winter, open window coverings during the day to let in solar radiation and shut them at night to keep the heat in. Emulate the pioneers by only exposing south and west-facing windows. In the summer, apply this principle in reverse. Keep windows shaded during the day to keep the heat out.
7. **Pay attention to your thermostat.** The NRDC recommends setting the thermostat to 68 degrees in the winter, and dropping it down to 55 degrees when you are asleep or are away from the house for more than a couple hours.
8. **Stop drafts in windows and under doors.** The Utah Department of Natural Resources suggests you can reduce your energy bill by 10 percent by ferreting out and sealing up air leaks. The DOE advises consumers to "pay special attention around windows and where siding or bricks and wood trim meet." Caulking, sealant, and weather stripping will do the trick and are available at most hardware stores. Cute little draft blockers can be had at most craft fairs.
9. **Close doors and vents to unused rooms.** Many of us live in houses with more space than we need, yet we still spend the money to heat empty rooms. The DOE calculates that, "by closing the vents to just one spare bedroom in a five-room house, you can instantly cut your heating bills by as much as 20 percent."
10. **Use an humidifier.** According to the DOE, "It's not the heat; it's the humidity." Moisture from a humidifier will increase the "heat index," making 68 degrees feel like 76. Maintain a relative humidity between 30 to 50 percent to keep condensation off the windows.

[Energy Department home guide](#)

Energy Star EPA Washington, DC 20460 Phone: (888) 782-7937

JENNIFER VOGEL *is an energy-conscious Yale graduate student and E intern.*

Scientists Claim Nuclear Fusion in Tabletop Test

Associated Press, April 28, 2005; *Washington Post*, p.A09

<http://www.washingtonpost.com/wp-dyn/content/article/2005/04/27/AR2005042702111.html>

Energy Created Was Too Little to Harness for Inexpensive Power, They Say

LOS ANGELES -- In the latest attempt to create nuclear fusion under laboratory conditions, scientists reported they achieved it in a tabletop experiment that uses a strong electric field generated by a small crystal.

While the energy created was too small to harness cheap fusion power, this new way of making nuclear fusion could have potential uses in the oil-drilling industry and homeland security, said Seth J. Putterman, a physicist at the University of California at Los Angeles, who conducted the study.

The experiment is reported Thursday in the journal *Nature*.*

For decades, scientists have sought to produce controllable nuclear fusion, the power that lights the sun. Fusion power has been promoted as the ultimate solution to the world's energy needs and a cleaner alternative to fossil fuels such as coal and oil, but even investigating potential ways of generating it requires enormous reactors that cost millions of dollars.

Claims of tabletop fusion have been met with skepticism.

In one of the most notable cases, B. Stanley Pons of the University of Utah and Martin Fleischmann of Southampton University in England shocked the world in 1989 when they announced they had achieved so-called cold fusion at room temperature. Their work was discredited after repeated unsuccessful attempts to reproduce it.

Fusion experts said the UCLA experiment was credible because, unlike the 1989 work, it did not violate basic principles of physics.

"This doesn't have any controversy in it because they're using a tried-and-true method," said David Ruzic, professor of nuclear and plasma engineering at the University of Illinois at Urbana-Champaign. "There's no mystery in terms of the physics."

In fusion, light atoms are joined in a high-temperature process that frees large amounts of energy. Fusion produces virtually no air pollution and does not pose the safety and long-term radioactive waste concerns raised by modern nuclear power plants, where heavy uranium atoms are split to create energy in a process known as nuclear fission.

In the UCLA experiment, scientists placed a *tiny crystal that can generate a strong electric field into a vacuum chamber filled with deuterium gas, a form of hydrogen*. Then the researchers activated the crystal by heating it.

The reaction gave off an isotope of helium along with neutrons, subatomic particles that are released in fusion reactions. The experiment did not, however, produce more energy than was put in, an achievement that would be a breakthrough.

Putterman said future experiments will focus on refining the technique for potential commercial uses, including designing portable neutron generators that could be used for oil-well drilling or scanning luggage and cargo at airports.

*"Observation of nuclear fusion driven by a pyroelectric crystal"

B. Naranjo, J.K. Gimzewski, S. Putterman

Nature 434, 1115-1117 (28 Apr 2005) *Letters to Editor*

Physicists Look To Crystal Device For Future Of Fusion

Mark Peplow, London, *Nature* 434, 1057 (28 April 2005) | <http://www.nature.com/nature/journal/v434/n7037/full/4341057a.html>

Abstract Desktop apparatus yields stream of neutrons.

Seth Putterman is usually on the side of the sceptics when it comes to tabletop fusion. But now he has created a device that may convince researchers to change their minds about the 'f-word'.

Tabletop fusion has been a touchy subject since Stanley Pons and Martin Fleischmann said in 1989 that they had achieved 'cold fusion' at room temperature. Putterman helped to discredit this claim, as well as more recent reports of 'bubble fusion'.

Now Putterman, a physicist at the University of California, Los Angeles, has turned a tiny crystal into a particle accelerator. *When its electric field is focused by a tungsten needle, it fires deuterium ions into a target so fast that the colliding nuclei fuse to create a stream of neutrons.*

Putterman is not claiming to have created a source of virtually unlimited energy, because the reaction isn't self-sustaining. But until now, achieving any kind of fusion in the lab has required bulky accelerators with large electricity supplies. Replacing that with a small crystal is revolutionary. "The amazing thing is that the crystal can be used as an accelerator without plugging it in to a power station," says Putterman.

Putterman got the idea when he delivered a lecture on sonoluminescence and energy focusing at the Georgia Institute of Technology, Atlanta. Physicist Ahmet Erbil suggested that Putterman should instead consider ferroelectricity.

"Here's someone telling me in front of 100 people that I'm working on the wrong thing," recalls Putterman. But the comment got him started on his fusion reactor. The result is published in this week's Nature (see page 1115).

Will he be able to avoid the controversy that has dogged other fusion claims? "My first reaction when I saw the paper was 'oh no, not another tabletop fusion paper'," says Mike Saltmarsh, an acclaimed neutron hunter who was called in to resolve the dispute over bubble fusion. "But they've built a neat little accelerator. I'm pretty sure no one has been able to generate neutrons in this way before."

Putterman himself isn't worried. "If people think this is a crackpot paper that's just fine," he says. "We're right. Any scientist who says this is too wonderful to believe is welcome to reproduce the experiments."

Related links RELATED STORIES

- [Collapsing bubbles have hot plasma core http://www.nature.com/uidfinder/10.1038/news050228-7](http://www.nature.com/uidfinder/10.1038/news050228-7)
- [US review rekindles cold fusion debate http://www.nature.com/uidfinder/10.1038/news041129-11](http://www.nature.com/uidfinder/10.1038/news041129-11)
- [Nuclear flash in a pan http://www.nature.com/uidfinder/10.1038/news020304-3](http://www.nature.com/uidfinder/10.1038/news020304-3)
- [Table-top nuclear fusion http://www.nature.com/uidfinder/10.1038/news990408-2](http://www.nature.com/uidfinder/10.1038/news990408-2)
- [Putterman on energy focusing http://www.physics.ucla.edu/Sonoluminescence/page2.html](http://www.physics.ucla.edu/Sonoluminescence/page2.html)
- [Fusion tutorial http://hif.lbl.gov/tutorial/tutorial.html](http://hif.lbl.gov/tutorial/tutorial.html)

Electrogravitics Becomes Validating

Thomas Valone, Integrity Research Institute, News Release July 1, 2005
www.IntegrityResearchInstitute.org

Electrogravitics II is the second in a series of books with scientific articles, just released by publisher Integrity Research Institute, on the connection of high voltage electric fields and gravity. The Navy, Air Force, NASA and Northrop-Grumman have all pursued and implemented T.T. Brown's discoveries of electrokinetics and electrogravitics for aviation improvements.

The scientific validation of a science that connects gravity to electricity usually could face an uphill, skeptical battle. This has been true of the 1994 publication of *Electrogravitics Systems: Reports on a New Propulsion Methodology* by Thomas Valone. However, eleven years later, a follow-up second volume called ***Electrogravitics II: Validating Reports on a New Propulsion Methodology*** has just been released which contains journal articles by the Army Research Lab and Honda Corporation on their experiments and theory of how electrogravitics can work, besides patents by NASA and others. In addition, the author introduces the subject with a discovery that the classical "electrokinetic field" equation can predict how and why pulsed electrogravitics will work best. He also explains in his article that the historic T. Townsend Brown experiments which led to the "Biefeld-Brown Effect" actually comprise electrogravitics and electrokinetics, which differ from each other.

With Science, Historical, Testimonial and Patent Sections, the book appeals to various audiences very well. For those who are interested in the details of the history, a complete reproduction of the three-part series on "Conquest of Gravity: Aim of Top Scientists in the U.S." is included, which appeared in the N. Y. *Herald Tribune*, November 20-22, 1955.

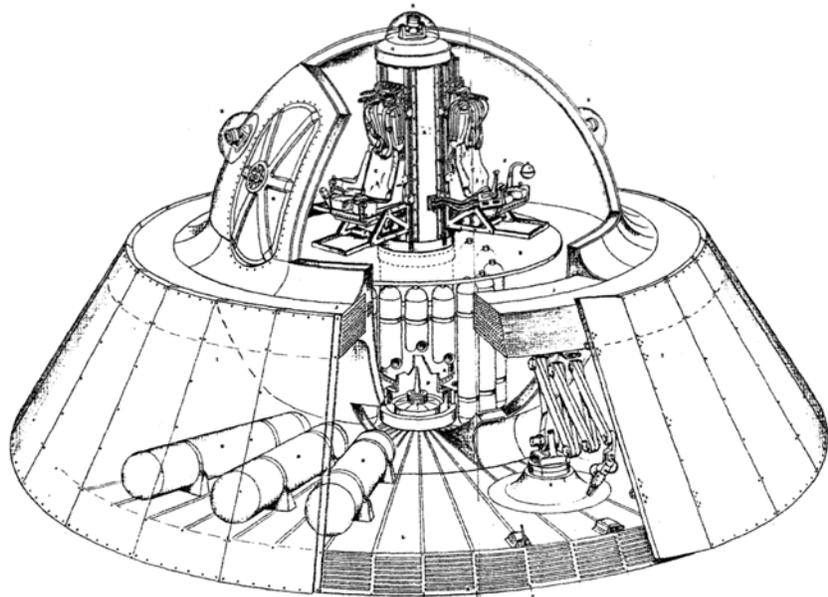
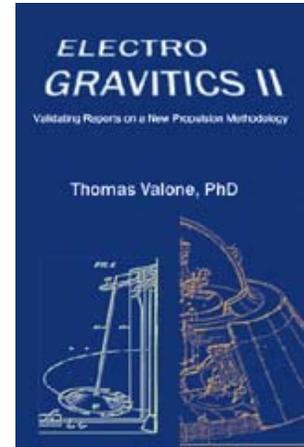
Overall, the book is interesting and scientific. The historical articles and the first-person testimonials are also intriguing. More compelling and convincing than first book in the series, *it is possible* that the discovery of pulsed electrokinetics will now be declassified as a result of the publication of *Electrogravitics II*.

For more information:

<http://users.erols.com/iri/electrogravitics.html>

Inside the book pictures and review available at Amazon.com:

http://www.amazon.com/exec/obidos/tg/detail/-/0964107090/ref=cm_rv_thx_vie/103-7979356-1241431?%5Fencoding=UTF8&v=glance



Norton AFB 1988 "hovercraft" explained in *Electrogravitics II* anthology, "Testimony of Mr. Mark McCandlish December, 2000" is probably a good candidate for declassification because of its age

Possible Declassification of Propulsion Technology

Thomas Valone, Integrity Research Institute, July 15, 2005,
www.IntegrityResearchInstitute.org

In May, 2005, while attending the National Space Society's **International Space Development Conference** (www.nss.org), it was sad to see X-Prize winner Burt Rutan, and keynote speaker, complain bitterly that no improvements in aviation or rocketry have been produced since the 1960's. Later on, it was interesting to observe the dynamics of a visual exchange between representatives from the National Science Foundation (NSF) and the National Reconnaissance Office (NRO). Watching the television show, *Alias*, one finds the NRO is mentioned frequently in conjunction with CIA activities but otherwise the NRO operates in relative obscurity, though it is bigger than the CIA. At the NSS conference presentation of Dr. Paul Werbos from NSF, Paul mentioned that he needed some "black technology" that he knew the military had classified. While insisting that he needed it for his space-bound nuclear reactor solar collector, he kept looking at the NRO Deputy Director, Bennett Hart.

During the NRO's presentation at the same panel discussion, Bennett indicated that the NRO was contemplating "major muscle moves" with 18-month turn-around for satellite launch requests. During the Q & A, I asked Bennett if it was possible that he would consider some inter-agency advocacy to declassify technology we need for space travel. He repeated the question to clarify it and then said "Yes."

Afterwards, I approached him personally to show him a few slides from my NSS talk that included the discussion about high voltage inertial shielding and the triangular planes using this that have been sighted repeatedly all over the country, exhibiting right angle turns. Since Newton's second law says that $F = ma$, I told him that this proves that inertial mass m can be reduced and shielded. With that technology alone, the lifting power or force "F" we currently used would be vastly improved with mass "m" greatly reduced and acceleration "a" increased.

He identified the concern for security issues and the fact that once something is classified and has value, it usually goes up the levels of classification until "it is out of sight." He also indicated that even if they fail in a project that is classified, it still will not be declassified. This reminded me of the story retired CIA agent A. Glenn Foster told me about Project X and the T. Henry Moray device he worked on before he died. (The project results are still classified though they found flaws in the process.) The conversation turned to **today's antiquated energy and propulsion methods that are decades old**. Even the photo of the triangular craft I showed him was over ten years old. Bennett indicated that they usually encourage industrial partners to pursue avenues of development which they know exist, so that it may "come out at a lower classification level." I complained that this means the taxpayers will pay twice for it and Congressmen

have been quoted in the press saying the same thing. I also expressed my opinion that **we are living with WW II technology that has been perpetuated by this military policy of not declassifying things soon enough for civilian economic benefit.** He said that he thought it was trickling out fast enough. I showed him a *Washington Post* article from Dec. 10, 2004 and said that if he was right, the new Public Interest Declassification Board would not be necessary. I told Bennett that I am 54 years old and during all my life, I have not seen any new energy or propulsion technology released by any military agency. However, we all know that due to public pressure alone, at least they declassified the Global Positioning System by removing the scrambling, which has benefitted thousands of civilians, with very few negative security repercussions.

Then, I retrieved my *Electrogravitics Systems* book to show him the use of electrogravitics on the B-2 as well as my *Electrogravitics II* book which explains electrokinetics and has the amazing **Norton AFB saucercraft with 1950's rivets but still hovers.** However, neither one has been declassified even into the 21st century. I said, since he indicated in his talk that he needs more lifting capability and faster launch schedules, the NRO needs improved propulsion technology as much as the civilian space program needs it. Several people had come to our IRI exhibit booth expressing a specific interest in new breakthrough propulsion technology as well.

I asked him if he knew AF people in high black areas who could be convinced to leak or declassify some of the propulsion technology to the public sector and whether he would do something about it. He said he would try.

We ended the conversation with me stating that our economy would benefit and he would benefit as well. He agreed that we were "both on the same wavelength" and we shook hands. Only time will tell if this historic encounter will be the turning point for the future.

A month later, while manning our exhibit booth at the Noetics Institute conference, I unexpectedly had a conversation with a senior official from the DOD counterintelligence office, who pointed enthusiastically at my *Electrogravitics Systems* book subtitle and announced, "I know all about the B-2 bomber." After an exchange of ideas and his purchase of everything IRI has on propulsion, antigravity, etc., I was convinced he was truthful. It also confirmed my long-standing belief in Dr. Paul LaViolette's article on the B-2 bomber's auxiliary electrogravitics system. Furthermore, I asked the gentleman whether we could have a future dialogue on the possible declassification of this propulsion technology. He replied that he needed to know what I knew about it first. This answer also indicated that one of the methods the military acknowledges declassification requests: you have to know specifically what to ask for.

As a postscript, it is worth noting that a DOE insider recently indicated to me that Boeing wants to use engine technology for their commercial aircraft that they developed for stealth vehicles. Apparently, it is a high voltage turbine and electrostatic shield that saves over 50% on jet fuel when in operation. It sounded like the benefits from

electrogravitics to me, which are well-known to include laminar flow of air over the wings. However, when Boeing applied in the past year to their customer, the US Air Force, for declassification permission, it was denied. Thus, once again, **we civilians are stuck burning fossil fuel at exponentially increasing rates, with consequential global effects**, mainly because of such non-democratic military decisions.

No further information is available on this topic, except by contacting your Congressman, Office of Naval Research, or Department of Defense. Recommended reading includes the *Disclosure* book by Dr. Steven Greer or the hardcover book, *The Body of Secrets* by James Bamford.

It's Getting Cheaper to Tap the Sun

By BARRY REHFELD, New York Times, June 18, 2005

<http://query.nytimes.com/mem/tnt.html?emc=tnt&tntget=2005/06/18/business/18solar.html&tntemail1>



Annette Benedict gave a party to celebrate the installation of solar panels on the roof of her Bronx home over a year ago.

John Sunde bought three systems in three years for the two Long Island homes he owns - two for the Brentwood house he lived in and a third for a Hampton Bays home he lives in now.

Susan Ferraro and her husband, Nick, featured their new network in the sales ad for their summer home on Shelter Island, N.Y., earlier this year.

Excitement over residential solar energy may not be running this high everywhere, but providing homes with electricity and heat from the sun is getting more buzz than it has in decades.

In the 70's it seemed that buyers of solar systems were mostly isolated tree huggers who somehow had a small fortune to spend on panels, but now urban and suburban homeowners are looking to the sun hitting their roofs for relief from rising electricity and heating costs.

Higher utility bills, though, are just the stick. The carrot is the falling cost of solar systems that are lighter and more efficient and feature new designs, like solar panels

that double as window awnings. Standardized installations and economies of scale for equipment production have helped drive costs lower.

In moving toward the energy mainstream, solar expenses have dropped to around **\$8 a watt**, from roughly \$100 three decades ago; the cost is even less if a system is installed as part of a new home's construction.

In either case, that puts the price of a system that can reduce electric bills significantly - like a three-kilowatt system - in the \$20,000 range. That's still a lot of money, but buyers may be able to get a lot of it back immediately, through government incentives. And with energy prices rising, the payback period for the rest is getting steadily shorter.

State programs developed in the last few years are making it possible for homeowners to cut the cost of a system by more than half, to less than \$4 a watt. These programs include rebates, tax refunds and access to utility grids, enabling homeowners to sell excess electricity back to power companies.

"Oil prices give people a reason to look, but then it's all about the incentives," says Gary Minick, president of Go Solar, in Riverhead, N.Y., who has been installing systems for 26 years. "I get eight calls a week now. I'm all booked."

While incentives can be found across the country, New York, New Jersey and Connecticut tend to give good deals. Forty states allow selling excess power back to utilities, according to the Database of State Incentives for Renewable Energy, and 19 offer rebates.

Typically, California led the charge when one of its utilities opened its grid to homeowners over a decade ago. Within a few years, New York was establishing itself as an East Coast solar beachhead. Now more than 700 New York homeowners have solar energy systems hooked up to utilities. New York has also licensed some 50 solar equipment installers.

"We've building for the long term," said Adele Ferranti, who works for the New York State Energy Research and Development Authority, which regulates solar installations. "We haven't had one failure for anything installed by the people we certify."

On Long Island, Mr. Sunde's systems are working smoothly, and he expects them to keep doing so over their guaranteed 25-year life. A staunch environmentalist who had dreamed of owning solar panels since he was a boy, he now has more power than he needs.

He couldn't have done it without the incentives. With rebates and tax refunds, he chopped nearly 75 percent off the \$115,000 bill, bringing the cost down to \$30,000. With about 7.5 kilowatts for each house, he wound up paying about \$2 a watt.

He did so well because Long Island kicked off New York's incentive programs with rebates of up to \$6 a watt. Now it's in line with the rest of the state, offering \$4, while the

newer New Jersey program, is the most generous in the New York metropolitan area, with **incentives of \$5.50 a watt.**

Exactly how much electricity a system provides and how long it takes for an installation to pay for itself, though, depends on many factors besides costs and incentives. Also important is the amount of shade at a house, the pitch of a roof (25 degrees is good, and typical for the Northeast except in areas that get heavy snow), and the direction the roof faces.

An additional factor is the amount of sunshine received, which depends on both latitude and average number of days with cloud cover. In Mr. Sunde's case, his new home has the edge over the old because its roof faces south. Over all, he calculates the payback period at a bit over 15 years.

"It's worth it," he said. "There's nothing to break. No moving parts. When I've saved as much as it cost me in the first place, I'll have free electricity."

Irene Pletka has two different solar energy systems at her Sag Harbor, N.Y., summer house. Copper tubing panels are used to heat her swimming pool, while silicon panels provide all the electricity for her home.

The copper panels for the pool's heating are alongside the roof deck, and the silicon modules providing electricity are attached like awnings above a bank of first-floor windows to keep out the summer sun. Copper trumps silicon for heating. For one thing, it warms water directly, where silicon panels must first convert solar energy to electricity. While there are no rebates or tax breaks for thermal heating systems in New York, her **\$2,500 pool system will still pay for itself in about two seasons.**

"You're also not limited the way you are with oil," she said, "thinking about swimming too early or late in the season because of the fuel you may use up."

A big challenge for solar heating comes during the winter, for the simple reason that the sun is around the least when it is needed the most. It is also difficult to heat interior space; hot air cannot be stored the way water can.

Brian Flanagan, though, had special reasons for installing a solar heating system in the Brooklyn house he bought last year. The building had a boiler with only enough capacity to heat the commercial space he rented out on the ground floor; the upstairs was too big, with too many windows, to heat in the winter.

Buying a small boiler and installing a roof-top solar unit with vacuum tubes (which do not lose heat the way copper tubes do) - plus large hot water storage tanks to save heat for a cloudy day - would, he reasoned, be more economical in the long run. The package cost \$33,000 compared with \$20,000 for a separate large boiler for his living space. But with lower heating bills, he expects the system to pay for itself in eight years.

"I'm no longer a slave to oil prices," he said. "I pay a fifth of what my tenant pays."

It's still too early, though, to tell if the added expense of solar equipment makes a home more valuable. Based on Susan Ferraro's experience selling her vacation home, the answer just might be: not yet.

"We thought it very pioneering, and we put it in our ads, thinking people would think it was as exciting as we thought it was," she said of her year-old system. "But it never even came up, even with the people who bought the house."

Some things will never change, though, like what got everyone interested in solar energy in the first place. "I read about it in a Sierra Club magazine," Annette Benedict said of her decision to install solar equipment. "It made sense. It was good for the environment." And good for her: she bought a piano with her rebate.

English Words Identified on a Triangular Craft

<http://www.ufocasebook.com/sydneytexas.html>

Occurred : 4/9/2005 19:09 (Entered as : 04/09/1905 19:09)

Reported: 4/13/2005 8:58:22 PM 20:58

Posted: 4/16/2005

Location: Sidney, TX

Shape: Triangle

Duration:3 minutes

English words identified on black triangular craft.

On 04-09-2005 I saw what I believe to be a UFO in Comanche County Texas at 9:12 local time. I offer some unique observations.

That evening, I was walking back to my motor home after wildboar hunting in an unpopulated area that I lease for hunting. The sky was clear; wind calm and the sun had just set. The sky was growing darker and darker blue straight above and stars were beginning to show. The sky was becoming black in the east. The setting sun was still keeping the western horizon illuminated and indirect lighting from the west made it possible to see my way without a flashlight.

I had my .243 Win. Remington 700 varmint rifle of which I am a quite an accomplished shooter. It is considered a "high-powered" rifle. I do quite a bit of bench rest competitive shooting with it as well as hunting. The rifle is set up with a high-tech "Leupold" optical sight, (scope) which is extremely accurate and highly specialized for great light gathering ability and performs best in low light conditions. It is not what is called a "night vision" sight. The scope magnifies the target image with great sharpness and definition and the magnification is adjustable from 4.5 to 14 times that of the natural image.

Upon my return to the motor home, I was tired after a long walk. I had carried quite a bit of equipment with me. I sat on a chair, took my eyeglasses off and toweled my face as it is already becoming hot in Texas. While I rested, without my glasses on, I noticed three very "unfocused" lights to my south and these lights were moving toward me. Immediately I put my glasses back on and saw what I believe was a UFO. (a) Is the appearance of the vehicle without my glasses on and (b) is the view I had with my glasses on.) (I drew the images on my pc) The object approached from the south-southwest and while moving north-north east, passed almost directly overhead making no sound whatsoever. I estimate its altitude to be somewhere about 800 feet and its airspeed speed approximately 30 mph. It "floated" and did not fly as it obviously had insufficient airspeed to fly. (I am a Physicist & an FAA Licensed Pilot) While the sky was almost entirely

black behind it, I could clearly see its underside as it was illuminated from the fading sunlight to the west. I estimate that the machine was about 60 feet wide and 80 feet long and 10 feet thick at the rear. Under its belly, there was a straight line going from its leading tip toward the center of the aft edge of the fuselage, which was perpendicular to its travel. This straight edge clearly showed its shape to be three-dimensional. The straight line showed that its belly was V-shaped, much like the hull of a speedboat. It was similar to the space shuttle as when viewed from in front and below the shuttle.

This machine was directly over me and I was alone in the middle of nowhere, therefore, I felt quite "uneasy." It made no threatening moves whatsoever, but I aimed my rifle at it and through the riflescope, which was set on 8.5 power, I could clearly see surface detail in explicit detail. The machine's surface detail appeared to be covered with well-fitted tiles, much like the ceramic tiles used on the United States Space Shuttle. Then in the fading light, I noticed a distinct marking.

This marking was absolutely shocking, as I could actually read it! It was white print outlined in black on a red arrow pointing toward a rectangle of sorts. The arrow pointed at a something rectangular that I cannot define, but I clearly could read these three words, "EMERGENCY RELEASE and RESCUE." In the same place were other words that appeared too fuzzy to read. I suspect that these words were "PULL FOR..." Instantly I realized that this was a military machine and no "flying saucer." I felt much better as I knew that these were surface details that were intended to help rescue people access and then be able to remove the pilots on board in the event of a crash.

I kept the crosshairs on the center of the aircraft as it disappeared into the darkness but as I realized it was "one of ours" and it was not a threat to my own personal safety (I think) I put the rifle safety back on. I can see however that others may have "defensively" shot at it --- and that may have resulted in a crash of the vehicle.

I am somewhat "pissed off" at the military as while this area is directly under the Ft. Hood, Texas MOPA and practice flights are flown daily, really - they should not be taking chances like this where someone on the ground could actually be shooting the damned things down! I am sure that the military pilots (if it even had a crew...) were aware of my presence but they NEVER expected possible "offensive action" to be taken against them on this low level flight. The last thing I would have ever have wanted would have taken a "defensive" shot and then find American military pilots onboard in the wreckage.

For further information

See <http://www.ufocasebook.com/sydneytexas.html> for physicist's illustration.

See <http://users.erols.com/iri/EnewsOct7,2004.htm> for "Black Flying Triangles" report from NIDS

See



<http://users.erols.com/iri/EnewsJan>

[6,2003.htm](http://users.erols.com/iri/EnewsJan6,2003.htm) "Electric

Propulsion Systems for Flying Triangles"

Gigahertz Stimulates DHEA in Elderly Patients

Excerpt from *Bioelectromagnetic Healing*, 6th Edition, Thomas Valone, PhD, p. 23
<http://users.erols.com/iri/Bioenergetics.html>

A medical doctor who worked with Nobel Prize winner, John C. Eccles, Dr. Norm Shealy has a journal publishing history extending back to his first papers in 1957 and neurophysiology papers with Eccles in the 1960's. He is the inventor of the transcutaneous electrical nerve stimulation (TENS) device in 1967, as well as the recent Shealy RelaxMate II. He is also noted for BEMS procedures that include Dorsal Column Stimulation - The control of pain by electrically stimulating the dorsal column of the spinal cord, and Facet Rhizotomy - The permanent, safe numbing of an irritating spinal joint nerve.

However, the most impressive achievement for longevity, that he discussed at a recent conference which I attended, is his Five Sacred Rings. These are different energetic circuits associated with acupuncture points which specifically optimize DHEA, Neurotensin, Beta-Endorphin, Aldosterone and markedly reduce Free Radicals. The one that stimulates the youth hormone, DHEA, is called the Ring of Fire and involves a 50 gigahertz signal device (GigaTENS) that touches the skin, one at a time, at several points in the circuit. Through repeated laboratory testing for careful monitoring of DHEA levels, Dr. Shealy was able to confirm the protocol that **restores youthful levels of the master hormone DHEA** by stimulating the pituitary gland to produce it. Shealy describes the unit as a Trip-Modulated GigaTENS with Optional Bipolar Spike as covered in his US Patent No. 5,851,223. The product has been incorporated into the ShealyTENS which is available by prescription for \$695 from Self-Health Systems <http://www.selfhealthsystems.com/> (417-267-2900).

His new book, *Life Beyond 100: Secrets of the Fountain of Youth*, contains the details of this amazing life-extension BEMS discovery. He also has a holistic university that offers degrees related to integrative health care. Dr. Shealy is also responsible for organizing the **first accredited Energy Medicine program in the country**, which is available at Greenwich University.

References

Dr. Norm Shealy Website: <http://www.normshealy.net/bibliography.htm>

Holistic University: <http://www.hugs-edu.org/>
<http://www.hugs-edu.org/sitemap.html>

Bioelectromagnetic Healing on Amazon: http://www.amazon.com/exec/obidos/tg/detail/-/0964107058/qid=1126141288/sr=8-1/ref=pd_bbs_1/103-7979356-1241431?v=glance&s=books&n=507846

What Lies Beneath the Void

Professor Chris Binns (Physics and Astronomy), University of Leicester, *eBulletin*, 2005
<http://ebulletin.le.ac.uk/features/2000-2009/2005/08/nparticle-82w-fqr-2cd>

Exciting project connected to the 'zero-point energy' of space

Three thousand years ago the Greek philosophers Leucippus and his student Demokritos proposed the concept of the atom, as a fundamental building block of materials, in order to circumvent a paradox that arises with continuous elements (such as earth fire air and water). They pointed out that if matter was really a continuum then you could cut it into smaller and smaller pieces ad infinitum and, in principle, cut it out of existence into pieces of nothing that could not then be reassembled. Thus, they reasoned, there must be a smallest piece of matter that could not be further divided the a-tomon (uncuttable) from which the word atom is derived. To complete the picture you also need a void in which the atoms move, a concept that produced fervent debate, for example, is the void a 'nothing' or a 'something' and is it a continuum or does the void itself have an uncuttable smallest unit.

While the atom, the legacy of Leucippus and Demokritos, is now a familiar part of the scientific landscape, the true nature of the void remains a mystery. In classical Physics the void is a 'nothing', a simple absence of all matter and energy. Quantum theory tells a different story and states that the void is definitely a 'something'. It is a seething mass of 'virtual' particles that fleetingly appear into and then disappear from our observable universe. This activity, known as quantum fluctuations, corresponds to an intrinsic energy of the void, the 'zero-point energy', which, if the void were a continuum, would be infinite. It is generally believed that there is a smallest piece of void, which makes the zero-point energy finite but still colossal beyond the imagination. Each cubic millimetre of empty space contains more than enough zero-point energy to create a new universe.

In a sense the actual value of the zero-point energy is not important because everything we know about is on top of it. According to quantum field theory every particle is an excitation (a wave) of an underlying field (for example the electromagnetic field) in the void and it is only the energy of the wave itself that we can detect. A useful analogy is to consider our observable universe as a mass of waves on top of an ocean, whose depth is immaterial. Our senses and all our instruments can only directly detect the waves so it seems that trying to probe whatever lies beneath, the void itself, is hopeless. Not quite so. There are subtle effects of the zero-point energy that do lead to detectable phenomena in our observable universe. An example is a force, predicted in 1948 by the Dutch physicist, Hendrik Casimir, that arises from the zero-point energy. If you place two mirrors facing each other in empty space they produce a disturbance in the quantum fluctuations that results in a pressure pushing the mirrors together. Detecting the Casimir force however is not easy as it only becomes significant if the mirrors approach to within less than 1 micrometre (about a fiftieth the width of a human hair). Producing sufficiently parallel surfaces to the precision required has had to wait for the emergence of the tools of nanotechnology to make accurate measurements of the force.

In the last decade this has happened and a spate of measurements using atomic force microscopes has confirmed Casimir's prediction to a precision of about 5% and the zero-point energy of the void is an experimental reality. This is just the beginning however as the force has only been measured in very simple geometries such as flat parallel plates. More recent calculations show that the force is sensitive to geometry and by changing the materials and the shape of the cavity you can alter the magnitude of the Casimir force and possibly even reverse it. This would be a ground-breaking discovery as the Casimir force is a fundamental property of the void and reversing it is akin to reversing gravity. Technologically this would only have relevance at very small distances but it would revolutionise the design of micro- and nano-machines.

The srif2 and srif3 investment by the University of Leicester in the Virtual Microscopy Centre and the Nanoscale Interfaces Centre has put the University in a key position to take a lead in Casimir force measurements in novel geometries. It has led to the award of an 800,000€ grant (NANOCASE) from the European framework 6 NEST (New and Emerging Science and Technology) programme to lead a consortium from three countries (UK, France and Sweden). The programme will use the ultra-high vacuum Atomic Force Microscope installed in the Physics and Astronomy department under srif2 to make very high precision Casimir force measurements in non-simple cavities and assess the utility of the force in providing a method for contactless transmission in nano-machines.

The new instrumentation to be installed soon following the srif3 investment will enable researchers to extend the measurements to yet more complex shapes and, for the first time, to search for a way to reverse the Casimir force.

This new wave of measurements will enable an unprecedented level of probing of the void and will provide important information on new theories of gravity and with sufficient precision will even put limits on the true number of spatial dimensions. Knowing how zero-point energy varies with the shape of an enclosure may also give clues to the origin of so-called 'dark energy', discovered recently.

Powdered Metal: The Fuel of the Future

Kurt Kleiner, NewScientist.com, Issue 2522, 22 October 2005,
<http://www.newscientist.com/channel/mech-tech/mg18825221.100>

Running on Metal

IF smog-choked streets test our love for petrol and diesel engines, then rocketing fuel prices and global warming could end that relationship once and for all. But before you start saving for the fuel-cell-powered electric car that industry experts keep promising, there's something you should know. The car of the future will run on metal.

So reckons Dave Beach, a researcher at Oak Ridge National Laboratory in Tennessee, who has come up with a plan to transform the way we fuel our engines. Chunks of metal such as iron, aluminium or boron are the thing, he believes. Turn them into powder with grains just nanometres across and the stuff becomes highly reactive. Ignite it, and it releases copious quantities of energy. With a modified engine and a tankful of metal, Beach calculates that an average saloon car could travel three times as far as the equivalent petrol-powered vehicle. Better still, because of the way that this metal nano-fuel burns, it is almost completely non-polluting. That means no carbon dioxide, no dust, no soot and no nitrogen oxides. What's more, this fuel is fully rechargeable: treat your spent nanoparticles with a little hydrogen and the stuff can be burnt again and again. It could spell the start of a new iron age, and not just for cars. All kinds of engines, from domestic heating units to the turbines in power stations, could be adapted to burn metal.

Topping up your tank with what are essentially iron filings might sound bizarre, but vehicles can run on all sorts of materials, from methane to coal dust or gunpowder. So why not metal too? After all, burning a heap of powdered iron releases almost twice as much energy as the same volume of petrol. And replacing iron with boron gives you **five times as much**.

Rockets already use metal powder as fuel. A dash of aluminium gives extra oomph to the space shuttle's solid rocket boosters, for instance, and metal powder is used in rocket-powered torpedoes.

However, putting metal inside a rocket engine is a very different proposition from using it in a car engine. When granules of metals such as iron and aluminium come into contact with air, they become coated with a layer of oxide that must be removed before the metal can ignite. To kick off combustion in most metals, you need a heat source with a temperature of at least 2000 °C, which is high enough to vaporise the oxide layer and expose the bare, reactive metal beneath. That might be fine for a rocket, but it's not so simple for a car engine. Another problem is that once the vaporised metal oxide starts to cool, it solidifies and forms ash. While high temperatures and clouds of ash present no problems in a one-shot rocket, they create a serious mess for anyone trying to burn metal powder in an internal combustion engine.

Solomon Labinov, also a researcher at Oak Ridge, is all too familiar with this problem. In the early 1980s, while he was the director of an engineering institute in Kiev, Ukraine, he and his team tried burning micrometre-sized iron particles in an internal combustion engine. They modified the engine to work at high temperatures, but found that the oxide ash deposited on the pistons, cylinder walls and valves, clogging up the engine. They couldn't find a way round the problem and gave up.

Labinov subsequently moved to the US, and went to work at Oak Ridge. In 2003 he suggested to Beach and theorist Bobby Sumpter that they take a fresh look at the problem, this time using nanoscale particles.

In experiments they found that iron nanoparticles measuring about 50 nanometres across ignited far more easily than the larger granules of iron that Labinov had worked with: heating them to around 250 °C, or even just a spark, could do the job. And the more the researchers looked, the more they realised that the nanoparticles behaved in a very different way to their less finely divided cousins.

Nanoparticles burn much more easily because their surface area to volume ratio is huge. Iron reacts very readily with oxygen, so if a lot of it is exposed to air at the same time, oxidation can generate enough heat to ignite the metal spontaneously. To prevent this, nanoparticles are usually given a protective oxide coating during manufacturing. But even with an oxide layer, the huge surface area of these nanoparticles means that with just a little heat, it is easy for oxygen molecules to diffuse through and trigger combustion.

One consequence of this is that once the nanoparticles are ignited by a spark, say, they burn rapidly and the combustion temperature peaks at around 800 °C - **hot enough to do useful work** but not so high as to melt an alloy engine. And crucially, unlike the micrometre-sized particles, nanoparticles don't burn hot enough to vaporise or even melt. They just oxidise, leaving a heap of oxide nanoparticles. And that means no sticking to the walls of the cylinder, and no clogged engine.

The tidy heap of iron oxide left over from the combustion process gave Beach an idea: he realised that it would be easy to convert the iron oxide back into usable fuel. He heated the burnt fuel to 425 °C in a flow of hydrogen. The iron oxide particles were reduced to iron, and the hydrogen combined with oxygen to form water. Now the fuel was ready to burn again.

There was one more problem to solve if the particles were to have any real potential as fuel. Individually, nanoparticles burn in a flash, releasing all their heat in a millisecond or so. But to make the metal fuel useful in a wide range of engines, the rate of heat production should not be so fast that an engine cannot deal efficiently with the heat produced. In internal combustion engines, for example, each burst of combustion can last anywhere between 5 and 20 milliseconds. If heat is released any faster, the fuel is used below its maximum efficiency.

So the team attempted to limit how quickly their fuel burnt by pressing the nanoparticles into larger clusters. The idea was to limit both how fast oxygen could diffuse into the nanoparticles and how fast heat could flow out of them, so reducing the rate of heat release.

The Plan Worked

Beach and his colleagues found they could create nanoparticle clusters weighing anything from 1 to 200 milligrams each, and by adjusting their size, shape and density they could control the burn rate. While single particles would burn in just milliseconds, the largest clusters could take from 500 milliseconds to two seconds.

With the first stage of the research complete, the team now plans to design an engine that can run on the fuel. It would be relatively easy, Beach believes, to convert external combustion engines such as the gas turbines that power jet aircraft and vehicles such as tanks, or even those used to generate electricity in power stations. These engines might operate on metal fuel without too much difficulty, he suspects, though they would certainly need modifications to the fuel-delivery systems, and he would need to find a way to collect the spent fuel.

Another option is to use the fuel to power a Stirling engine, an efficient external combustion engine in which a fluid or gas in a cylinder is alternately cooled and heated to move a piston (New Scientist, 11 December 1999, p 30). Stirling engines are used in domestic combined heat and power units, for example, and for cooling satellites.

When it comes to cars, a Stirling engine is a possibility: NASA and a number of car manufacturers, including Ford, have already experimented with Stirling engines designed to power vehicles. But Beach also hopes it will be possible to use his metal fuel in an internal combustion engine. A modified diesel engine might be able to burn nanoparticle powder as a fuel, just as a conventional diesel engine uses a mist of diesel fuel.

Beach suggests that metal powder or clusters could be injected into the engine cylinders from a storage tank, possibly using a jet of air, which could also supply the oxygen for combustion. A spark plug would trigger ignition and burnt fuel would be carried from the cylinder by the exhaust gases.

Beach's team must also find a way to collect that spent fuel. One possibility is to store it in the fuel canister, with a movable membrane dividing the canister into two sections, one for fresh and one for spent fuel. The burnt fuel might be collected using a filter or, since iron oxide powder is ferromagnetic, an electromagnet. When a driver needed a top-up, the entire canister could be unclipped and exchanged for a fresh one at a filling station, and the used fuel would then be recharged.

“Scrapyards full of old cars could become fuel for the vehicles of tomorrow”

The result would be an engine similar to a conventional one, but which emits no carbon dioxide, harmful particulates or even nitrogen oxides. These compounds usually form in combustion at high temperatures, but Beach has shown that he can lower temperatures to about 525 °C by varying the size of the clusters. However, plenty of work is still needed to strike the right balance between temperature, speed of combustion and engine efficiency.

A vehicle running on metal fuel should please both drivers and environmental campaigners. Beach calculates that a fuel tank holding 33 litres of his iron fuel will power a car engine for the same distance as a 50-litre tank of conventional petrol or diesel.

Heavy load

There are still major drawbacks, however, the most significant of which is weight, according to Nathan Glasgow, a consultant at the Rocky Mountain Institute, a think tank in Snowmass, Colorado. Although iron is a compact fuel compared to hydrogen, it is also extremely heavy, and even though its high energy content allows you to almost halve the size of a typical 50-litre fuel tank and still get the same energy out, a tank of fuel would weigh about 100 kilograms - more than twice as heavy as the petrol it replaces. And because the spent fuel is kept on board, unlike the polluting by-products of conventional fuel, this weight won't decrease as you drive - you must always lug the full load around. The weight of fuel will also add to the cost of shipping it back and forth to recycling facilities.

David Keith, a physicist at the University of Calgary in Alberta, Canada, is satisfied that the technology itself is sound, but believes there are fundamental difficulties with iron as a fuel. Even if everything works perfectly, he says, the fuel is simply too heavy to be really useful.

So for the ultimate in clean, green driving, perhaps hydrogen really is the answer. After all, it packs over 12 times as much energy per kilogram as iron.

Beach is unconvinced. Of course hydrogen is important, he says, but you don't want to be filling your tank with it. "What we're saying is that metal fuel is a more convenient, safer, and more practical energy carrier than hydrogen." And it's true that engineers are still struggling to find ways to store hydrogen at densities high enough to make it a practical alternative to petrol. In contrast, metal fuel is stable at room temperature, so it is easy to store and transport. "We've got a solid at ambient pressure. So moving it around on freight cars or storing it for long periods of time isn't a problem," says Beach.

Besides, there's a potentially more serious problem with hydrogen-powered vehicles that the use of metal would sidestep. The water produced by hydrogen fuel cells is usually just allowed to escape into the atmosphere. Some climate scientists are concerned that the huge amounts of water vapour released by millions of hydrogen-powered cars and trucks would accelerate global warming.

Recycling metal oxide fuel with hydrogen also produces water vapour, but it would be generated at large recycling units rather than by vehicles out on the road. This means that it would be simple to collect the water and recycle it - perhaps even using electrolysis to convert it back into hydrogen.

It might even be possible to dispense with hydrogen altogether. If carbon sequestration becomes viable, carbon monoxide could be used to recycle spent metal fuel, creating carbon dioxide. Carbon monoxide is a common by-product of coal gasification - one of the technologies likely to become more important as the coal industry attempts to reduce its contribution to global warming. Use this carbon monoxide directly for recycling fuel and the industry would get more useful energy out of its coal than before.

Beach has even got some solutions to the weight issue. Use aluminium nanoparticles rather than iron, for example, and you get about four times as much energy per kilogram. With boron you'd get almost six times as much. Of course, since these metals cost more than iron, the fuel would be more expensive in the first place. Aluminium, for instance, costs about 15 times as much as iron.

Clearly it is very early days for metal power. The Oak Ridge researchers are still applying for grants to build a prototype engine, and Beach has yet to carry out a full analysis to find out whether his fuel could be cost-effective. The team also plans a series of experiments to optimise the size of its nanoparticles, as well as to investigate the best way to package, inject and collect the stuff in a real engine. And even if their work succeeds, who is going to buy the first metal-powered car when there's nowhere to fuel it, and who is going to build a network of fuel stations until there are cars to fill?

At the very least, **metal-burning engines are another entry in the list of alternatives to oil.** And whatever happens, Beach's remarkable idea does raise one interesting possibility. In the past, energy magnates have earned billions from coal, oil and gas fields. In the future, they could grow rich from scrapyards full of yesterday's cars, by transforming them into fuel for the vehicles of tomorrow.

More Mech-Tech Stories

- • [Gunpowder: A blast from the past](http://www.newscientist.com/channel/mech-tech/mg18825241.800)
www.newscientist.com/channel/mech-tech/mg18825241.800
- • [The robot that thinks like you...](#) /channel/mech-tech/mg18825241.700
- • [Nanoscale 'spring' thermometers are highly sensitive](#) /mg18825245.200
- • [Explore: mech-tech](#) /channel/mech-tech/

Study: Human Hands Emit Light

Jennifer Viegas, *Discovery News*, September 6, 2005
http://dsc.discovery.com/news/briefs/20050905/handlight_print.html

Human hands glow, but fingernails release the most light, according to a recent study that found all parts of the hand emit detectable levels of light.

The findings support prior research that suggested most living things, including plants, release light. Since disease and illness appear to affect the strength and pattern of the glow, the discovery might lead to less-invasive ways of diagnosing patients.

Mitsuo Hiramatsu, a scientist at the Central Research Laboratory at Hamamatsu Photonics in Japan, who led the research, told *Discovery News* that the hands are not the only parts of the body that shine light by releasing photons, or tiny, energized increments of light.

"Not only the hands, but also the forehead and bottoms of our feet emit photons," Hiramatsu said, and added that in terms of hands "the presence of photons means that our hands are producing light all of the time."

The light is invisible to the naked eye, so Hiramatsu and his team used a powerful photon counter to "see" it.

The detector found that fingernails release 60 photons, fingers release 40 and the palms are the dimmest of all, with 20 photons measured.

The findings are published in the current *Journal of Photochemistry and Photobiology B: Biology*.

Hiramatsu is not certain why fingernails light up more than the other parts of the hand, but he said, "It may be because of the optical window property of fingernails," meaning that the fingernail works somewhat like a prism to scatter light.

To find out what might be creating the light in the first place, he and colleague Kimitsugu Nakamura had test subjects hold plastic bottles full of hot or cold water before their hand photons were measured. The researchers also pumped nitrogen or oxygen gas into the dark box where the individuals placed their hands as they were being analyzed.

Warm temperatures increased the release of photons, as did the introduction of oxygen. Rubbing mineral oil over the hands also heightened light levels.

Based on those results, the scientists theorize the light "is a kind of chemiluminescence," a luminescence based on chemical reactions, such as those that make fireflies glow. The researchers believe 40 percent of the light results from the chemical reaction that constantly occurs as our hand skin reacts with oxygen.

Since mineral oil, which permeates into the skin, heightens the light, they also now think 60 percent of the glow may result from chemical reactions that take place inside the skin.

Fritz-Albert Popp, a leading world expert on biologically related photons at The International Institute of Biophysics in Germany, agrees with the findings and was not surprised by them.

Popp told *Discovery News*, "One may find clear correlations to kind and degree (type and severity) of diseases."

Popp and his team believe the light from the forehead and the hands pulses out with the same basic rhythms, but that these pulses become irregular in unhealthy people. A study he conducted on a muscular sclerosis patient seemed to validate the theory.

Both he and Hiramatsu hope future studies will reveal more about human photon emissions, which could lead to medical diagnosis applications.

For further information:

Coherent natural and stimulated biophoton emissions are explained in detail, along with several charts and graphs from Popp, in Chapter 2 of the book, *Bioelectromagnetic Healing: A Rationale for its Use*. More details and "look inside the book" on Amazon: http://www.amazon.com/exec/obidos/tg/detail/-/0964107058/qid=1102310161/sr=1-1/ref=sr_1_1/102-5658383-5861757?v=glance&s=books

IBM Claims Better LED

R. Colin Johnson Nov. 17, 2005 www.eetimes.com

PORTLAND, Ore. — IBM Corp. unveiled Thursday (Nov. 17) what is said is the world's first electroluminescent nanotube transistor and claimed it glows 1,000 times brighter than a light-emitting diode with as much as 10,000 times more photon flux.

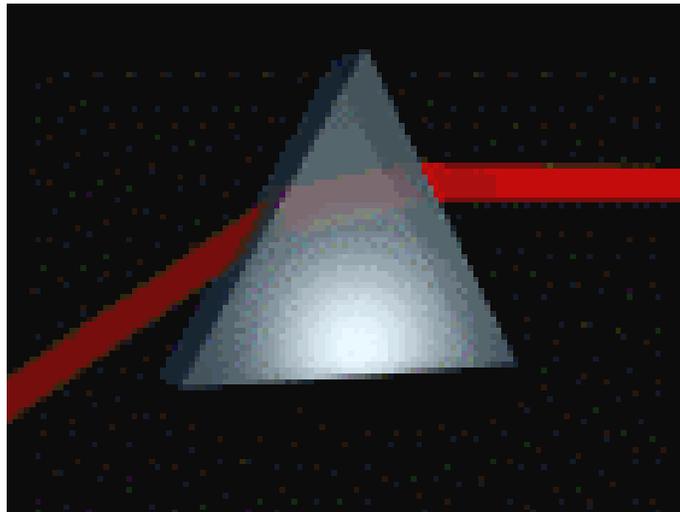
By emitting thousands of photons in silicon with the same energy expenditure as one photon in gallium arsenide, IBM predicted that carbon nanotube transistors will lead to integrated optics on silicon chips. According to IBM, integrated optics on silicon chips could lower costs, accelerate electronics and mitigate the need for exotic semiconductors like gallium arsenide.

IBM said its technique achieves 1000-fold brighter emissions by electrically stimulating a carbon nanotube suspended over a doped silicon wafer. The resulting excitons are electrically neutral, yet emit infrared light when recombined.

Other research groups have reported light emission by carbon nanotubes stimulated to photoluminescence with a laser. IBM claims its technique uses only electrical stimulation to create an exciton density that is 100-fold larger than photoluminescence in nanotubes.

IBM claimed it achieved very high efficiency with its light-emitting technique, IBM through the extreme confinement within a 2-nm-diameter carbon nanotube suspended from each end over a silicon back gate.

IBM fabricated the light-emitting transistor by etching trenches in a silicon dioxide film on a highly doped silicon wafer. The wafer substrate acted as a back gate to the carbon nanotube transistor. The resulting devices emitted infrared light with strength that was exponentially related to the back gate's drive current.



IRI Financial Report 2005

Figures from IRS Form 990-EZ

Revenue and Expenses: Fiscal Year Ending December 31, 2005

Revenue	
Contributions	\$6,265
Program Services	\$0
Investments	\$0
Special Events	\$0
Sales	\$17,533
Other (Memberships)	\$3,535
Total Revenue	\$27,333
Total Expenditures	\$25,385
NET GAIN/LOSS	\$1,948

Balance Sheet: Fiscal Year Ending December 31, 2005

Assets	Jan 1, 2005	Dec 31, 2005
Cash & Equivalent	\$3061	\$1237
Land and Buildings	\$0	\$0
Other	\$5020	\$6437
Total Assets	\$8081	\$7674

Liabilities	Jan 1, 2005	Dec 31, 2004
Total Liabilities	\$5715	\$3360

FUND BALANCE	\$2,366	\$4,314
---------------------	----------------	----------------