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Newsletter



NEW ENGLAND CHAPTER OF THE HEALTH PHYSICS SOCIETY

Volume XXXVII No. 6
APRIL 2002

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NECHPS MEETING NOTICE

Joint Meeting of the New England and Connecticut Chapters

Date: Thursday, April 25, 2002

Location: Marriott Hotel, Providence, RI

Time: 5:30 p.m. Registration/Cash Bar
6:00 p.m. Dinner
7:00 p.m. Guest Speaker

Topic: The Health Physics Society
"Health Physics Is About Education"

Speaker: John Frazier, President-Elect, Health Physics Society

Menu: Mixed Green Salad or Caesar Salad
Baked New England Scrod
OR
Chicken Forestiere (i.e. Chicken Marsala with Mushrooms)
Chef's Choice of Potato and Vegetable
Vanilla Ice Cream with toasted almonds, & chocolate chips

Cost: \$30.00 Members, \$40.00 Guests, \$15.00 Students

DIRECTIONS TO PROVIDENCE MARRIOTT (SEE REVERSE SIDE OF SHEET)

Registration Deadline is April 19, 2002.

Cancellations must be made before April 19, or you are responsible for payment.

Name: _____ Phone: _____

Dinner Choice (pick one): Fish or Chicken

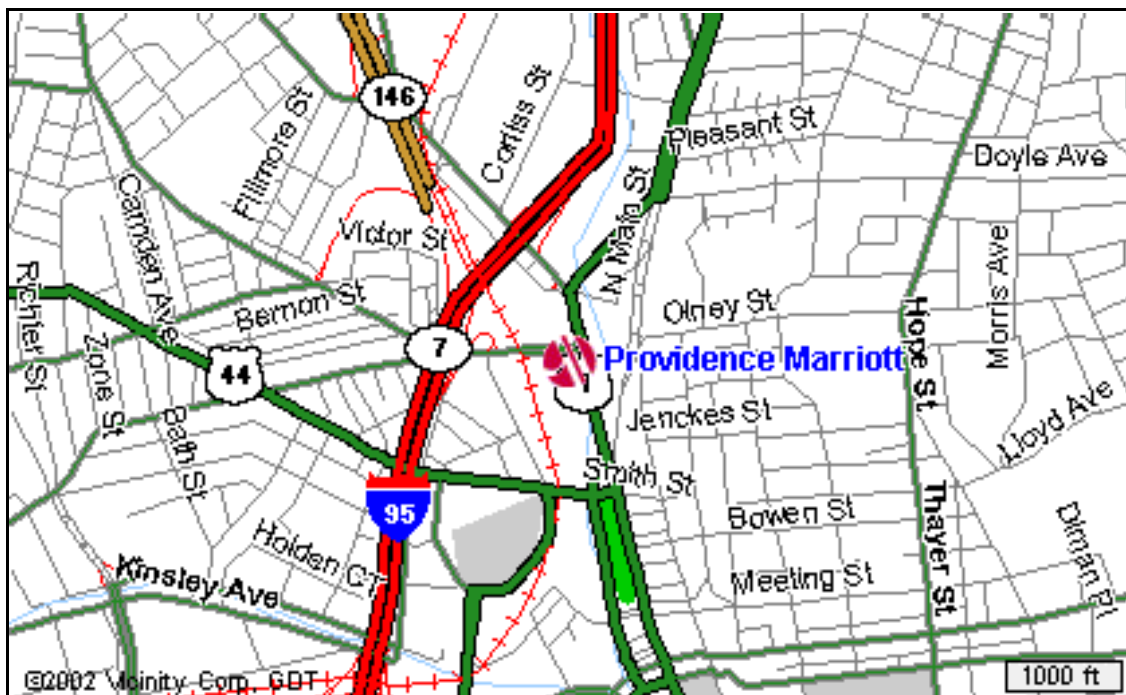
Mail registration (with check to NECHPS) to: Ed Maher
42 Tuttle Drive
Acton, Massachusetts 01720

OR Register online at **www.nechps.org** OR call (978) 568-2785

DIRECTIONS TO THE PROVIDENCE MARRIOTT

- 95 North Bound
(From New York)** *Take Exit 23 (State Offices Exit). At top of ramp, at the stop sign, turn left. Marriott can be seen on the left hand side.*
- 95 South Bound
(From Boston)** *Take Exit 23 (Charles Street Exit). At bottom of exit ramp, take a right (this is a one way road); follow until you see VF Liquor Store on the left hand side where you will make a left turn. Follow this road for another ½ mile and the Marriott will be on the right hand side.*
- From 195 West
(From Fall River)** *Follow 195 West to 95 North (Boston). Take Exit 23 (State Offices Exit). At the top of the ramp, at the stop sign, turn left. Marriott can be seen on the left hand side.*
- From Hartford
(From Rte 6 East)** *Follow Route 6 East and take the 295 South / 6 East Exit. Follow for ½ mile to 6 East – Providence, Exit 5. Follow to 6 East, 10 North. Proceed to 6 East, 95, 195 signs. Follow signs for 95 North – Boston. Take Exit 23 (State Offices Exit). At top of ramp, at the stop sign, turn left. Marriott can be seen on the left hand side.*
- From 146 South** *Take Admiral Street Exit. Make a left at the first set of lights. Make a right at the next set of lights (which turns on the Charles Street). Follow this road for another ¾ of a mile and the Marriott will be on your right hand side.*
- From TF Green
Airport** *Exit airport and follow signs for 95 North to Providence. Take Exit 23 (State Offices Exit). At top of ramp, at the stop sign, turn left. Marriott can be seen on the left hand side.*

Providence Marriott
One Orms Street, Providence, Rhode Island 02904
401.272.2400



Data shows world awash in stolen nuclear material

Submitted by William Lorenzen

SAN FRANCISCO, March 6 (Reuters) - International researchers have compiled what they say is the world's most complete database of lost, stolen and misplaced nuclear material -- depicting a world awash in weapons-grade uranium and plutonium that nobody can account for.

"It truly is frightening," Lyudmila Zaitseva, a visiting fellow at Stanford University's Institute for International Studies, said on Wednesday. "I think this is the tip of the iceberg."

Stanford announced its database as U.S. senators held a hearing in Washington to assess the threat of "dirty bombs," or radioactive material dispersed by conventional explosives. The Stanford program, dubbed the Database on Nuclear Smuggling, Theft and Orphan Radiation Sources, is intended to help governments and international agencies track wayward nuclear material worldwide, supplementing existing national programs that often fail to share information.

The project took on added urgency following the Sept. 11 attacks on New York and Washington, which spurred fears that extremists might seek to use nuclear weapons in the future. "It blows the mind, the lack of information," said George Bunn, a veteran arms control negotiator and a member of the database group. "What we're trying to say is: 'What are the facts?'"

CHILLING FACTS

The facts, even on cursory examination, are chilling. Zaitseva said that, over the past 10 years, at least 88 pounds (40 kg) of weapons-usable uranium and plutonium had been stolen from poorly protected nuclear facilities in the former Soviet Union.

While most of this material subsequently was retrieved, at least 4.4 pounds (2 kg) of highly enriched uranium stolen from a reactor in Georgia remains missing. Other thefts have included several fuel rods that disappeared from a research reactor in the Congo in the mid-1990s. While one of these fuel rods later resurfaced in Italy -- reportedly in the hands of the Mafia -- the other has not been found.

The Stanford group, led by nuclear physicist and arms control researcher Friedrich Steinhausler, decided to form its database after becoming alarmed over the patchy nature of most of the available information. Combining data from two existing unclassified databases and adding new information from sources ranging from government agencies to local media reports, the team has evaluated each entry for accuracy and probability.

An expert at the Federation of American Scientists, the oldest U.S. arms control group, welcomed the establishment of the database, saying it could play a crucial role in helping governments ascertain

the real level of nuclear threat.

"This is a smart step," said Michael Levi, director of the group's Strategic Security Project. "Knowing what's out there is the first step to bringing it back in."

'ORPHAN' RADIATION ALSO A THREAT

The database includes illicitly obtained weapons-grade nuclear material as well as "orphaned" radiation sources -- scientific or medical material that may have been lost, misplaced or simply thrown away but which still poses a health and security threat.

Steinhausler said the database would be open only to approved researchers, and that the Stanford group was beginning to contact government agencies in the United States and Europe about sharing information to build more effective international supervision of nuclear material.

"We cannot supply the means to improve the situation," Steinhausler said in a statement. "We're pinpointing weaknesses and loopholes and saying, 'Do something about it.'"

Zaitseva, visiting Stanford from the Kazakhstan National Nuclear Center, said the database was helping to build a dim picture of the market for stolen uranium, plutonium, and other dangerous materials. But she added that while in many cases those behind nuclear thefts can be identified, the ultimate destination of the nuclear material has remained a mystery.

"We haven't found a single occasion in which the actual end users have been caught," Zaitseva told Reuters. "We can only guess by the routes where the material is going. We can't say for sure if it is Iraq, Iran, North Korea, al Qaeda or Hezbollah. We can only make assumptions."

She added that the dangers of an unsupervised, underground market in nuclear material were likely to grow, noting that a U.S.-sponsored program to secure nuclear components in the former Soviet Union thus far had only locked up about a third of an estimated 600 tons of weapons-usable material.

"It's just not protected," she said. "This is hot stuff. If you steal 20 kilograms of that material, you can build a nuclear weapon."

NRC upgrades security at U.S. nuclear plants

Submitted by Michael Whalen

Washington - February 27 - (CNN) -- The Nuclear Regulatory Commission issued orders Tuesday to all 104 of the nation's nuclear power plants, upgrading the high-level security measures already in place.

"Some of the requirements formalize a series of security measures that NRC licensees had taken in response to advisories issued by the NRC in the aftermath of the September 11 terrorist attacks," the commission said. "Additional security enhancements, which have emerged from the ongoing comprehensive security review, are also spelled out in the orders."

The agency provided few specifics, but new security requirements generally include:

- Increased patrols.
- Augmented security forces and capabilities.
- Additional security posts.
- Installation of additional physical barriers.
- Vehicle checks at greater standoff distances.
- Enhanced coordination with law enforcement and military authorities.
- More restrictive site access controls for all personnel.

The commission said the requirements will stay in effect until the threat level has diminished or until other security changes are needed following a comprehensive re-evaluation of safeguards and security programs.

Under the new orders, licensees are required to provide the NRC with a schedule for achieving full compliance within 20 days.

Licensees would also have the same time frame to notify the agency if they feel they are unable to comply with any of the requirements or if implementation of any requirement would adversely impact safe operation of the facility.

Study: 1950s nuclear fallout worse than thought

Submitted by Michael Whalen

TAKOMA PARK, Maryland (CNN) -- Radioactive fallout from 1950s above-ground nuclear weapons testing spread farther than researchers previously realized and most increased cancer rates in the United States, according to a scientific report.

"Any person living in the contiguous United States since 1951 has been exposed to radioactive fallout, and all organs and tissues of the body have received some radiation exposure," the Centers for Disease Control and Prevention and the National Cancer Institute said in a progress report prepared for Congress. The report was reviewed by the Institute for Energy and Environmental Research.

The preliminary report -- the actual study is not yet complete -- has alarmed some members of Congress, including Sen. Tom Harkin, D-Iowa. "What we know is maybe the tip of the iceberg here," Harkin said. "We know that there's been upwards of perhaps 15,000 deaths that are attributable to these nuclear tests." Congress received the preliminary report last August.

More than 2,000 nuclear tests have been conducted worldwide since the first nuclear bomb was built in the Manhattan Project in World War II, but the CDC/NCI study considered only those above-ground tests that took place between 1951 and 1962. The United States and the Soviet Union agreed in 1963 to restrict nuclear tests to underground sites.

"What is surprising and very new is that it has created intense hot spots in the continental United States all the way from California and Washington to Vermont, New Hampshire and North Carolina," said Dr. Arjun Makhijani, president of the IEER.

And yet, the government has yet to formulate a public health response, according to IEER outreach director Lisa Ledwidge, a biologist. She noted that officials in the 1950s notified suppliers of photographic film of expected fallout patterns so they could protect their film, but did not share the information with milk producers, for example.

A 1997 report by the National Cancer Institute, which dealt with only one radionuclide -- iodine-131 -- indicated that "farm children ... who drank goat's milk in the 1950s in high fallout areas were as severely exposed as the worst exposed children after the 1986 Chernobyl nuclear plant accident," Makhijani said.

The IEER called for the government to expand its compensation program for test site "downwinders" to include hot spots thousands of miles from the test sites themselves, and to formulate and implement a comprehensive response to the public health threat posed by the fallout. Harkin agreed.

"People have a right to know if they were exposed where the big areas of fallout were and they need to be screened and told what to do to protect their health," the senator said.

Tiny bubbles create nuclear fusion -- maybe

Submitted by Michael Whalen

WASHINGTON (Reuters) -- Tiny bubbles imploding in a solution of acetone may have generated nuclear fusion, Russian and U.S. scientists said Monday, in an experiment that, if confirmed, represents a giant advance in nuclear physics.

The experiment was run in a series of beakers that would take up only a corner of any tabletop, using what amounts to souped-up nail polish remover and sound waves.

Because the collapsing bubbles produced temperatures as hot as those found in the sun, the experiment does not mean that the long-sought goal of cold fusion has been achieved, scientists warned.

But if it can be replicated, it could mean an easy way to generate nuclear energy has been found -- one that mimics what the sun does and that would be many times safer than current nuclear fission methods used by modern-day power plants and makers of atomic bombs.

Nuclear fusion joins, or fuses, hydrogen atoms or other light atoms in a reaction that creates a third, heavier atom and creates energy as a byproduct. This is how the sun generates heat and light.

Bombs and nuclear plants use another process, nuclear fission, which is the splitting of an atom such as uranium to create a burst of energy.

Fusion is much more desirable as it can use the hydrogen found in water and it produces fewer radioactive waste products.

Reporting on their experiment in the journal *Science*, Rusi Pusi Taleyarkhan of the Russian Academy of Sciences and colleagues at Oak Ridge National Laboratory in Tennessee and the Rensselaer Polytechnic Institute in Troy, New York, said they had created a special form of the ordinary solvent acetone by substituting a variant of hydrogen called deuterium for the hydrogen atoms found in an acetone molecule.

They chilled it to the freezing point of water and pulsed it with sound waves. Tiny bubbles, no larger than the size of a period, appeared and then imploded, sending out flashes of light and, they said, high-energy neutrons.

The process is called "acoustic cavitation," a phenomenon studied for nearly a century.

Temperatures inside these bubbles can be about as hot

as the sun's surface, and recent experiments suggest they can be even hotter -- 10 million degrees or as hot as the temperatures inside the sun where nuclear fusion takes place.

"If the results are confirmed this new, compact apparatus will be a unique tool for studying nuclear fusion reactions in the laboratory," Fred Becchetti of the University of Michigan wrote in a commentary on the findings.

"But scientists will -- and should -- remain skeptical until the experiments are reproduced by others. Many, including the author, could not reproduce past claims made for table-top fusion devices," Becchetti added, referring to a now-discredited 1990 experiment that made headlines when scientists said they had caused nuclear fusion in what amounted to a glass of water at room temperature.

Becchetti added that Monday's report had been reviewed by other scientists and was "credible until proven otherwise."

An immediate challenge has already come from the Oak Ridge National Laboratory, which helped conduct the experiment. The lab reviewed the work and said its scientists could find no evidence of the key neutron emissions.

Taleyarkhan, who could not be reached immediately for comment, said the reviewing scientists had improperly calibrated their detector and misinterpreted the findings, *Science* said in a statement.

*****TIME TO UPDATE THE SOCIETY'S DIRECTORY*****

A valuable tool to all around, the New England Chapter of the Health Physics Society Annual Directory is being updated. But, it is only as good as the information that you, its members, provide. So please, update your membership information through the web page; www.NECHPS.org! It's simple. At the Home Page, go to the bottom of the page and click on 'Join Us', then at the next page click on the white word 'Application.' This brings you to the 'Membership Action Form.' Here you can update your personal information that will be published in the next membership directory.

Please take the time to enter your information, as the directory is as only good as the contributions that each of you make. I may be contacting some of you to verify information, or if you are having trouble with the Web Page, please feel free to contact me; Brandon Graber, (860) 447-1791 x3504, or E-mail me Brandon_L_Graber@Dom.com.

From the Vaults

Submitted by Tom O'Connell

The New England Chapter of the Health Physics Society (NECHPS) has a virtual who's who list of members that we should wear as a proud badge. So, I thought it would be of interest to the readers of the newsletter to randomly select documents from the chapter's history files and report on these issues of the day and who was involved at the chapter level.

The history file of the month is November 1969. Abraham Goldin is president with Jerry Parker, the person that hired me into my first job out of college, as the president-elect and Charlie Killian as Secretary-Treasurer. Ray Johnson was the chapter's newsletter editor. Other notables mentioned in the current and outgoing board of directors are Pete Littlefield, Bob Hallisey and Frank Massé.

It is interesting to note that the last four persons mentioned are still very committed, supportive and active in the NECHPS. This fact speaks volumes to the commitment that our members have to the local chapter and the benefits associated with the health physics profession.

The chapter was having joint meetings with the AIHA and APCA (five points if anyone knows that acronym). Sound familiar, it should as Ed Maher has made joint sessions one of the cornerstones of his meeting agenda as president-elect.

Another five points if you can guess the location of the Annual NECHPS meeting. The facility is located in Lynnfield, MA (did Mr Massé have anything to do with this?).

Hot topics included concerns over the health effects to workers exposed to microwave radiation, a state and federal survey conducted in 181 High Schools indicating that radiation sources could pose a potential exposure problem for teachers and students if improperly used and a series of reports issued by the Atomic Energy Commission on advance reactor concepts.

Hmmm... some of the same topics we are wrestling with today; although we may be in the second, third or fourth iterations of the same hot topics of the day

in 1969, we too will offer up our solutions for future chapter members to reflect upon.

If these mullings receive a positive response from the readers, I will continue to submit my ramblings for consumption by the readers of the newsletter. If you have any requests for a specific time period, please contact the newsletter editor.

Only ONE Meeting left!!!

Annual Meeting - June 6, 2002

Westford Regency

Wesford, MA

Membership Dues

Members are reminded that they should pay their dues *as soon as possible* to ensure that membership status remains in good standing. You may check your dues status by looking at the mailing label attached to this newsletter - the label will have a statement in the upper right corner: "Paid thru July 2001", for example.

Remember that the current By-Laws state that dues are \$10.00 per year, however, a payment of \$40.00 will get a member 5 years of Chapter membership.

Please send your payment to Ron Thurlow, NECHPS Treasurer, 21 Myrtle Ave, Newburyport, MA, 01950. Dues are always accepted and payable at the Chapter's technical meetings.

***BELLE* International Conference:**

**NON-LINEAR DOSE-RESPONSE RELATIONSHIPS IN BIOLOGY,
TOXICOLOGY, AND MEDICINE**

June 11 - 13, 2002

**University of Massachusetts Amherst
Murray D. Lincoln Campus Center**

Conference Directors: Edward Calabrese, Ph.D., and Paul Kostecky, Ph.D.

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