

# Particle Post November 2011

*"He who thanks but  
with the lips*

*Thanks but in part;*

*The full, the  
true Thanksgiving*

*Comes from the  
heart."*

*~ J.A. Shedd*

Previous issues

## Note from the Chair Thomas Roser



Preparations for the upcoming RHIC run are proceeding well. To give more time to complete the installation of a new detector component of STAR the start of the cool-down is now scheduled for January 17, 2012, which still leaves enough time for a 22 weeks of cryo-operation before the hottest part of the summer.

As you may have seen in the October 10 Monday Memo the APS's Committee on the Status of Women in Physics has conducted a climate assessment on how BNL attracts and retains female scientists and submitted the report with recommendations recently. The report can be found at <http://www.bnl.gov/diversity/files/pdf/CSWP-SiteVisitBNL-Final.pdf>.

Even though the climate assessment focused on scientists most of the recommendations can also be applied to the climate for all women employees at BNL. I encourage you to read the report and send your thoughts and feedback to either to me or Mei Bai, the two C-AD members of a BNL Task Force to review the report's findings and determine

a path forward.

## Administration Stephanie LaMontagne-McKeon



The initial guidance received from DOE's Office of Nuclear Physics for FY 2012 provides funding *nearly equivalent* to that provided in FY 2011 although we were advised that *"these tentative amounts were developed before receipt of the FY 2012 Senate Appropriations Committee mark and will be updated upon final action on the FY 2012 appropriation."*

Based on this guidance, we are cautiously moving forward with plans to operate RHIC for 22 weeks, the "advertised" minimum length for an effective 2 species program. DOE's self-imposed 2-year salary freeze is a significant factor in our ability to manage in the absence of budget growth, although escalation in the non-salary cost components of the budget will require that we implement some cost saving measures to ensure that a 22 week run is financially feasible. A Departmental hiring freeze put in place last May will be continued and limitations imposed on all but essential procurement activity. In total, it will be necessary to

reduce procurement activity on RHIC Operations accounts to ~80% of the \$10M invested in purchases in FY 2011.

In summary, it is once again time to demonstrate our financial resourcefulness in the achievement of our programmatic goals.

## Accelerator Division Wolfram Fischer



The NSRL Run continues until 18 November 2011. After the run, the Booster inflector will be modified to allow larger beams from EBIS to be injected. The EBIS commissioning with heavy ions is ongoing, and the transmission efficiency into the Booster has now increased. A ½ turn injection in the Booster with the barrier cavity was tested, in preparation of a merging scheme in the AGS to increase the



**bunch intensity for RHIC.**

To inaugurate the new MCR, the Operations Group is preparing an Open House on 16 November 2011, 3:30pm. Everyone is invited to tour the new room, and see the difference to the previous control rooms we had. Refreshments and hors d'oeuvres will be served.

We will start the AGS a week before the holidays in December to check out all systems. If the polarized proton performance can be re-established we will not operate any machines between the holidays and New Year. The RHIC cool-down to 4K is now scheduled to begin on 17 January.

From 2 to 4 November our Machine Advisory Committee met and reviewed the past performance as well as our upgrade plans for luminosity and polarization. The committee report starts: "The committee compliments the RHIC team for many excellent accomplishments during the last year. The luminosity runs were very successful; for gold collisions the expectations were significantly exceeded, and also the proton run exceeded all goals except for the integrated luminosity, which suffered from several unforeseeable technical faults."

## Experimental Support & Facilities Division Phil Pile



Our schedule for the start of RHIC Run12 has slipped. The new start date for cool-down is now Tuesday, 17 Jan. This two week slip in the schedule was a result of a delivery delay of prototype carbon fiber parts necessary for the final assembly of the new STAR Forward Gem Tracker. The delay was actually 3 weeks so the resulting schedule to make this only a 2 week slip is now very aggressive! So far though the schedule is holding. Once the cool-down begins our plan is to run for about 22 weeks, budget permitting. The PHENIX shutdown work is on or ahead of schedule.

The NSRL facility has been operational since 26 September and will run through the Friday before Thanksgiving. The run has gone well with Booster operations controlled from our new MCR. Beams of iron, protons, silicon, gold, oxygen and titanium have been delivered to the biology and physics experiments so far during this run. The Tandem facility is providing beams to the Booster for this run to allow more time

for commissioning the EBIS for the upcoming RHIC run. Our thanks goes to the Tandem staff! The plan for the NSRL spring run is to use the EBIS concurrent with RHIC with the Tandem accelerators providing back-up.

The BLIP isotope production facility is scheduled to begin operations in early January and run

through most of July – a long run this year due to scheduling issues at the Isotope Production Facility (IPF) at Los Alamos – we share medical isotope production responsibility with the IPF.

## Accelerator R&D Division Ilan Ben-Zvi



A lot of work has been done at the ERL over the past month. Significant progress is being made on all aspects from controls school cryogenics, beam lines, gun cryomodule, 5 cell cavity, beam instrumentation, laser, photo cathode and vacuum. Infrastructure for superconducting radiofrequency, such as the mezzanine, the vertical test facility and vacuum furnace is also making great strides.

The 56 MHz cavity is nearing completion at the manufacturer.

Building 940 has been refurbished, and is ready to serve as student and postdoctoral fellow offices for the Center for Accelerator Science and Education.

## Operations Paul Sampson



The NSRL program run is running well while preparation for the RHIC run 12 continues elsewhere around the CAD complex. The new Main Control Room is now operational and MCR, CAS, Cryogenics and other personnel have adapted quickly to the state-of-the-art facility. As the NSRL run winds down, preparations for Booster modifications designed to enhance operation with beam from EBIS are under way and scheduled for completion before restart in early December.

Elsewhere in the CAD complex, major work continues to progress. In the AGS nearly all shutdown projects are nearing completion. These included; magnet survey, Sextupole magnet replacement and modification of the polarized proton jump quad vacuum chamber. Cool-down of the AGS superconducting snake will begin this month.

Major projects in and for RHIC are entering their final phases and 9 and 28MHz RF, stochastic

cooling system, e-lens infrastructure, instrumentation, cryogenics, vacuum and others. In the experimental halls, STAR is preparing for

EBIS commissioning continues with major focus on increased efficiency and Barrier Bucket setup in the Booster. Barrier bucket setup will continue until November 18<sup>th</sup>, when the Booster will be opened for C3 inflector modification. EBIS work will continue upstream of the beam-stops until the Booster work is complete.

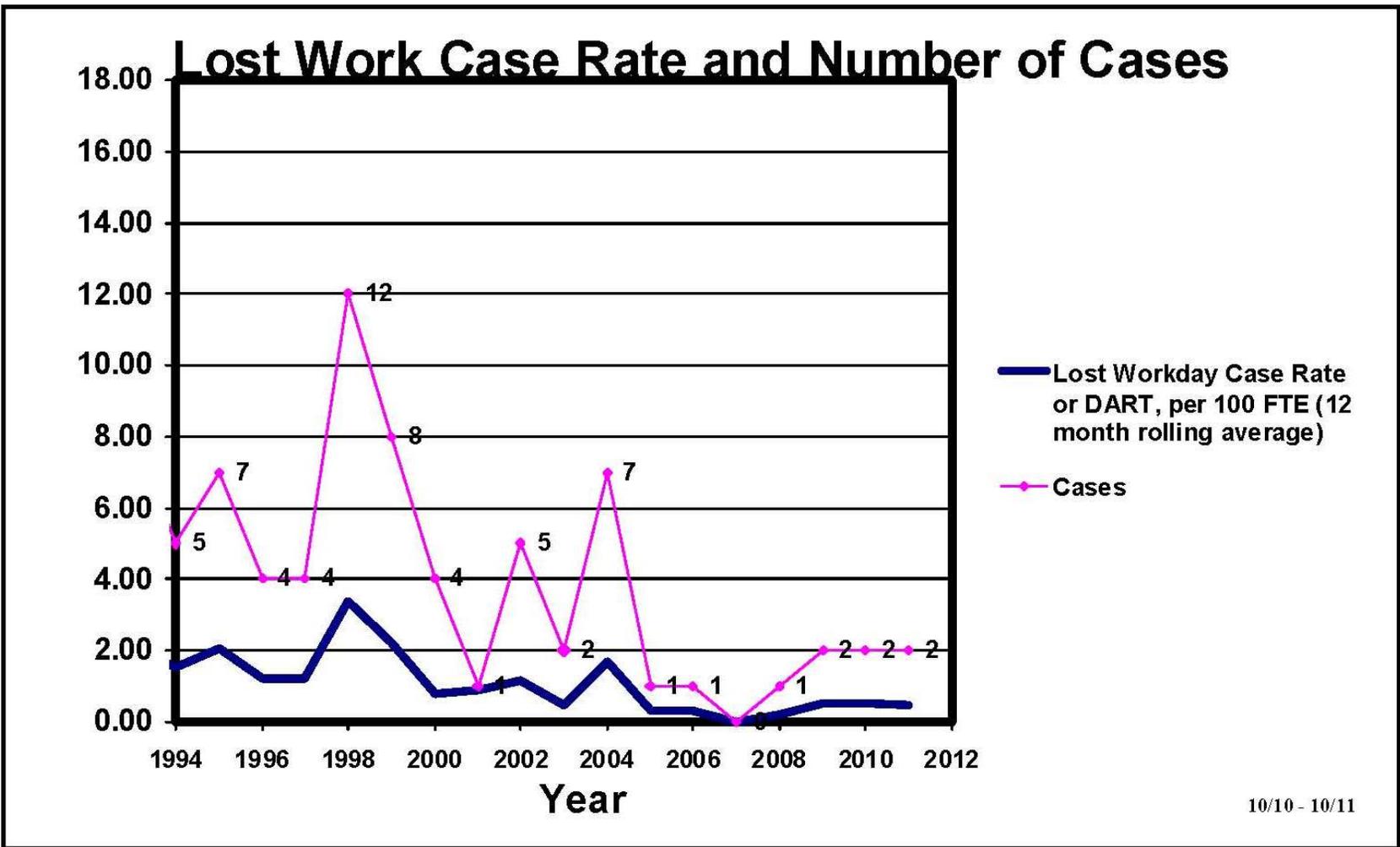
Daily startup schedules can be viewed on the [CATV](#) system.

For updates on shutdown progress see: [Shutdown Progress](#)



C-AD has a Cooperative Research and Development Agreement (CRADA) with Best Medical International of Springfield, VA, to design and build a rapidly cycling synchrotron facility to deliver radiation treatment to cancer patients. This unique machine would be able to deliver either protons or carbon ions, depending on the particular cancer to be treated. The Phase I of the CRADA, the delivery of a pre-conceptual design report, has been completed. Phase II, a contract for 28 months, is about to begin with the receipt of the first funding of approximately \$6M, to deliver the first articles of a complete magnet girder assembly, a power supply to power the system and a RF cavity. We expect that in the near future, the contract will be expanded to deliver all the components of a complete synchrotron, that will likely be tested on the AGS experimental floor.

## Safety Stats



## C-AD Occupational Injury Statistics

**For Year\* 2010      For Year\* 2011**

<b>First Aid Cases</b>	<b>5</b>	<b>3</b>
<b>Recordable Cases</b>	<b>2</b>	<b>2</b>

# Lost Work Cases

1

2

\* Calendar Year through 10/11

**REMINDER:** TLD exchange is done the *FIRST FRIDAY* of the Month.

**EXCHANGE DATE:** FRIDAY, December 2, 2011

*Pete Cirigliario*

**RHIC Newsletter.** Please click on link to the left to view the latest web publication of RHIC News.

*We wish all of you born in **November**  
a happy and healthy year ahead.  
Birthday people **ONLY** click on cake*



# C-AD Service Awards October

<b>30 years</b>	<b>Paul Ziminski</b>
<b>25 years</b>	<b>Leonard Masi</b>
<b>20 years</b>	<b>John Maraviglia</b>

**Congratulations!**

## FUN TIME

This is a JavaScript version of Break Out. Keep the ball bouncing and try to clear the entire field of blocks. Cool!

## BNL History: Still Present

# Sharing the Story of Technetium-99m

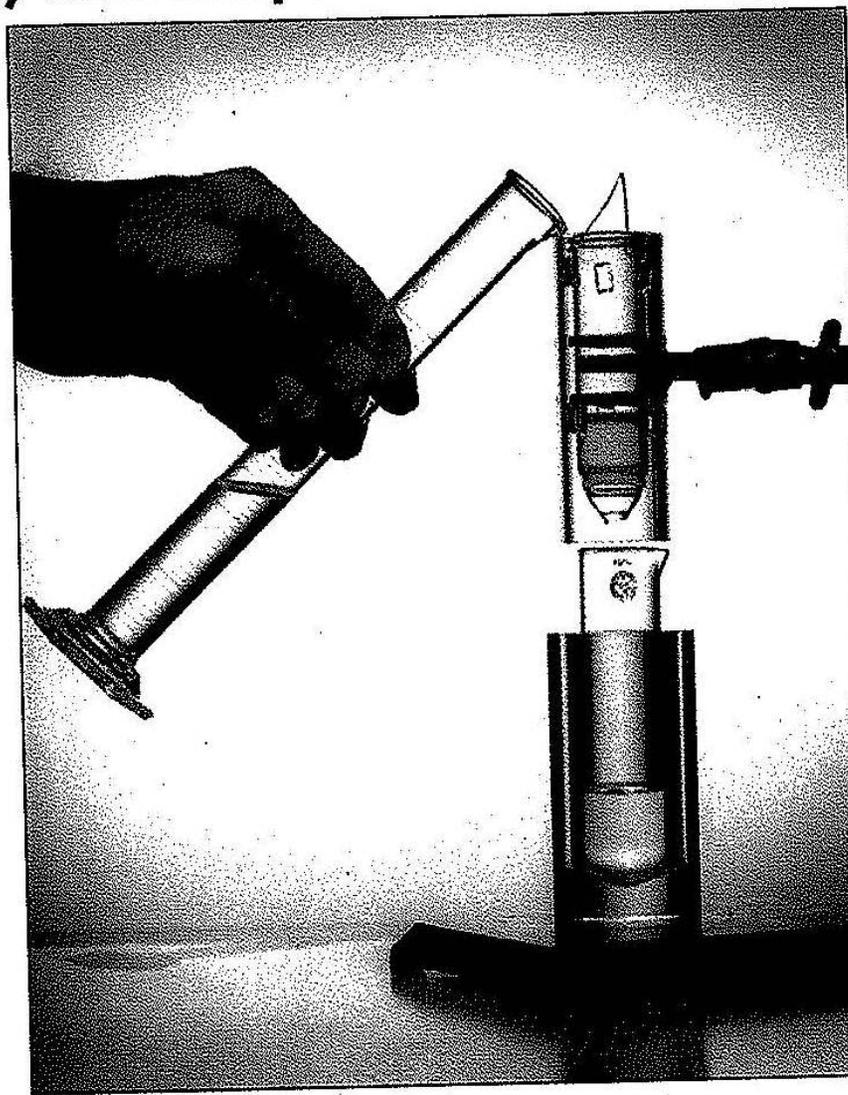
*The most commonly used isotope in medical imaging got its start at BNL*

Every day, about 110,000 medical imaging procedures worldwide (with more than 40,000 in the U.S. alone) rely on the element technetium in its unstable radioactive form — as the isotope, technetium-99m (Tc-99m) — to create images from inside the human body.

Medical professionals administer isotopes like Tc-99m to a patient, and these isotopes bind to specific areas of the body. Scanners, including SPECT (single photon emission computerized tomography) machines then detect these isotopes as they decay, producing an image of what is going on inside the patient's body. Tc-99m is the most commonly used medical isotope in the world and its birthplace is BNL.

"This isotope has changed the face of nuclear medicine and saved millions of lives," said BNL's Suresh Srivastava, head of the Radionuclide & Radiopharmaceutical Research Division. Srivastava was among BNL scientists who contributed to improving the Tc-99m generator and developing multiple Tc-99m-based imaging agents.

"Historically, BNL has been — and still is — a unique place to accomplish this kind of research,"



the Lab had to pass production to commercial generator companies. Today, Tc-99m is administered worldwide into more than 40 million patients annually.

### Present Day Recognition

In recognition of BNL's role in the development of Tc-99m, the commercial Tc-99m generator producer Covidien (formerly Mallinckrodt) created an exhibit, "We are the Generators," that was presented at the last Annual Congress of the European Association of Nuclear Medicine in Vienna, Austria, in October, 2010. Covidien asked Srivastava to represent BNL at the exhibit, which recounted Tc-99m's history.

In addition, at this year's Annual Meeting of the Society of Nuclear Medicine (SNM) in San Antonio, TX in June 2011, Covidien put together and donated a framed display describing the story of the development of the Tc-99m generator at BNL that was auctioned at the SNM Annual Meeting silent auction to benefit the Society of Nuclear Medicine. At this meeting, a "Breakfast with Covidien" meeting on "Global Mo-99/Tc-99m Supply: A Look Forward" was heavily attended.

Indeed, as attested by sources

## Medical Isotopes at BNL

Technetium-99m is just one of many



the 'theragnostic' use of radioisotopes, may

Mort Rosen 11-23-2011

said Srivastava. "We have had what it takes from a to z."

Though the element technetium had been studied and isolated in the 1930s, it was not until 1957 that Walter Tucker and Margaret Greene developed the first Tc-99m generator at Brookhaven. Shortly thereafter, Powell "Jim" Richards, who oversaw BNL's radioisotope production, became convinced that Tc-99m could be a valuable tool for medical imaging.

Largely through Richards' championing of this isotope, others in the medical and scientific community began to take notice. Despite an initially tepid reception—efforts to patent the isotope failed as most offices deemed Tc-99m as an isotope purely for research and laboratory purposes — in 1961, BNL met the first order for a Tc-99m generator sent to Argonne Cancer Research Hospital for use in blood flow measurements.

There, the hospital's Paul

is just one of many medical isotopes developed at BNL. Currently, Suresh Srivastava is studying the isotope tin-117m that has emissions that allow pre-therapy, low-dose imaging plus higher-dose

therapy in the same patient. Certain tin-117m labeled compounds not only image coronary artery plaques, but can also be used to treat these plaques in the cardiovascular system. Tin-117m is also effective in treating symptoms such as bone pain in cancer patients, as well as potentially effective in the treatment of metastatic bone disease. This combination of molecular imaging and therapy, referred to by Srivastava as

Harper observed Tc-99m's application to imaging thyroid gland and brain tumors, sparking a



Suresh Srivastava

R.S. DISTRIBO

very well empower personalized medicine and mark the future of the field of nuclear medicine. At present, two start-up companies are engaged in this research to eventually enable

commercialization of the BNL-developed tin-117m technology.

Other "BNL" isotopes in very wide use include the most sensitive and widely used isotope in PET (positron emission tomography) imaging, fluoro-deoxy glucose (F-18 FDG), which was developed by Joanna Fowler and colleagues in the 1970s, and thallium-201, which is still considered the "gold standard" for heart stress tests."

— D.Y.

new wave of interest. Within six years, the demand for BNL's generator became so high that

such as a House of Representatives Bill, 7/21/09, and an article in *Nature*, 12/12/09, the global supply of Tc-99m has dramatically decreased, creating a crisis situation. Considerable effort is being made by various countries, including the U.S., to develop technology to replenish the availability. Certain options being considered include developing high-current electron accelerators that use x-ray technology to produce molybdenum-99, from which Tc-99m is made.

"Speaking for the Lab, we feel proud to have contributed so much to this field," Srivastava said. "BNL has been the birthplace of many medical isotopes, and the research done here has improved millions of lives, and enabled early stage diagnoses, the key to saving patients. This research has immensely benefited humanity."

— Daisy Yuhas



Per Dahl, who joined the staff of the Accelerator Department on August 29, 1963 died at the age of 79 on October 1, 2011. Per worked on superconducting magnet development and design. He left BNL on July 1, 1989, to work on the Superconductor Super Collider, then joined Lawrence Berkeley Laboratory, keeping contact at BNL as a visiting scientist, and consulting in the early days of

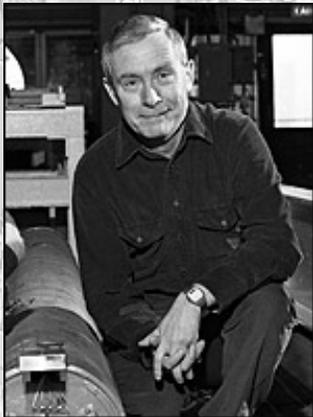
the Relativistic Heavy Ion Collider magnet program. See obituary below.

## *In Memoriam: Per Fridtjof Dahl*

[A](#) | [B](#) | [C](#) | [D](#) | [E](#) | [F](#) | [G](#) | [H](#) | [I](#) | [J](#) | [K](#) | [L](#) | [M](#) | [N](#) | [O](#) | [P](#) | [Q](#) | [R](#) | [S](#) | [T](#) | [U](#) | [V](#) | [W](#) | [X](#) | [Y](#) | [Z](#)

[In Memoriam Home](#) | [Bulletin Home](#)

Posted: October 20, 2011



Per Fridtjof Dahl, a physicist, artist, and historian of modern physics died on October 1, 2011 after a two-to-three year-long struggle with lung cancer.

Per Dahl was born at Georgetown Hospital in Washington, D.C., on August 1, 1932. His parents were Odd Dahl, from Drammen, Norway, and Anna Augusta (Vesse), from Eau Claire, Wisconsin. Dahl was born while his father was working at the Carnegie Institution in Washington, D.C. In 1936, his father saw the war coming and decided to take his family back to Bergen, Norway. He returned to Norway in 1937 to oversee science in Norway during the war.

Dahl grew up in Bergen, Norway, from the age of 4 until he was 17. He then came to the U.S. and served three years in the U.S. Army, including two years stationed on Guam in the Pacific. Taking after his father, Dahl was interested in science and physics from an early age. He studied science during his Army years, and after leaving the service he entered the University of Wisconsin, obtaining his Ph.D. in Physics in 1960. His post-doctoral work was done at the Niels Bohr Institute in Copenhagen, Denmark.

Per Dahl came to Brookhaven National Laboratory (BNL) in 1963. He arrived at a time when superconductors were beginning to move from laboratory development to industrial production. At this time, development of accelerator magnets using NbTi and Nb<sub>3</sub>Sn began. Per became involved in the design of these magnets early in his BNL career and acquired a good understanding both of the materials and their use in magnets. He put this knowledge to good use later in his BNL career when he became the principal person writing about magnets and superconductors for technically-oriented audiences. This work also provided him with an opportunity to display his skills as an artist. His drawing that shows all the critical components of a superconducting cable is still used in talks for visitors to Brookhaven.

Per began working on the larger stage of the Superconducting Super Collider (SSC) in 1987, where he continued work documenting the magnet program. When the SSC effort moved from the design location, Berkeley, to the laboratory location in Texas, Per expanded his work to include both the documentation of the conventional construction effort and preparation of information in support of the SSC mission (e.g., publisher of the SSC News).

Following termination of the SSC project in 1993, Per moved to the Accelerator and Fusion Research Division at Lawrence Berkeley National Lab (LBNL). During much of that time he was on leave to the Office of High Energy Physics, where he was Program Officer for a number of university grants. He also consulted with BNL about the nascent RHIC magnet system. He retired from LBNL in 1996 but kept contact with the lab through a visiting scientist appointment and work at the Office for the History of Science and Technology at UC-Berkeley until 2005.

Dahl is the author of numerous scientific papers and several books: ***From Nuclear Transmutation to Nuclear Fission, 1932-1939***

(Institute of Physics Publishing, Co., Bristol, England and Philadelphia, PA, USA, 2002); ***Heavy Water and the Wartime Race for Nuclear Energy***

(Institute of Physics Publishing, Co., UK, Bristol England and Philadelphia, PA, USA, 1999), which was featured

in the NOVA TV-production, ***Hitler's Sunken Secret***

, DOX Production, London, 2004;

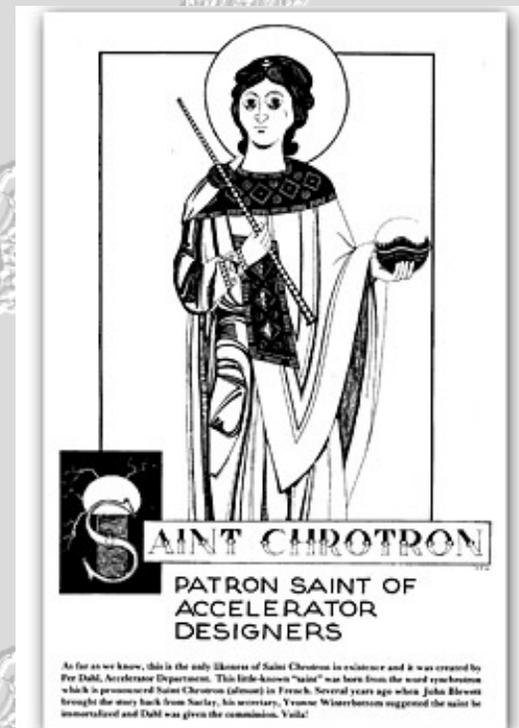
***Flash of the Cathode Rays: A History of J. J. Thomson's Electron***

(Institute of Physics Publishing, Co., UK, Bristol, England and Philadelphia, USA, 1997);

***Superconductivity: Its Historical Roots and Development from Mercury to the Ceramic Oxides***

(American Institute of Physics, New York, 1992);

***Ludvig Colding and the Conservation of Energy***



**Principle:  
Experimental and  
Philosophical  
Contributions**

, The Sources of Science N. 104  
(Johnson Reprint Corp., New York and London, 1972).

The illustration of "Saint  
Chrotron" by Per Dahl was taken  
from the Brookhaven Bulletin of January 14, 1976

[+ ENLARGE](#)

Throughout his life, Dahl was able to pursue his love for physics, art and his family. While at Brookhaven, he was a president of the South Bay Art Association (1967-1968), and he was also the president of the Brookhaven National Laboratory Art Society for several years. He was a fellow of the American Physical Society.

He is survived by his devoted wife of 45 years, Eleanor, and two sons: Erik (married to Christa), of Pebble Beach, CA; and Thomas (married to Jo) and two grandchildren, Emily and Alex, of Westford, MA.

Peter Wanderer, Brookhaven National Laboratory, NY

Eleanor Dahl, Emeryville, CA

Erik J. Dahl, Pebble Beach, CA and Thomas F. Dahl, Westford, MA



Last Modified: October 20, 2011

**Patricia Gassaway, who joined BNL as a clerk B on January 3, 1961, and moved first to the Alternating Gradient Synchrotron Department in March 1965, and then to the Director's Office in September 1986, died at 84, on July 28, 2011. She retired as a senior administrative services assistant on January 31, 1994.**

**We received word that Norman "Knute" Carlson, passed away December 25, 2010. He came to the Lab in 1964 and worked at the 80 inch Bubble Chamber. He retired from BNL in 1986. His son John works in the Instrumentation Division.**

**OUR CONDOLENCES TO ALL FAMILY MEMBERS**



*The Food Pantry needs our help...*

*If everyone can bring in at least one non-perishable food item, this would help the local food pantries in our area. There are so many families who are in need of food and depend on their local food pantry to have at least one meal a day. With the food supply so low, the volunteer's who help out at our local food pantries can't help those in need. So please.....bring whatever you can to replenish the food supply for those in need.*

*Your donation of any non-perishable food item can be left in the box marked "Food Drive" located in the 911A Lobby. Your continued support is appreciated.*

*Thank you.*

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From: Carter, Christine B

Reality Check! J 3 weeks till Thanksgiving, 7 weeks till Christmas!! Have a happy & safe Halloween!

**Food & Toy Drive: \*Keeping things simple for the Holidays:** Gift cards for \$10 or **ANY AMOUNT** to any grocery store or general merchandise store (think Target, Wal-Mart, or K Mart) will be accepted for the annual Toy Drive & Thanksgiving Food Drive, which will then be distributed to 16 agencies through the Brookhaven Town Interface Programs. Food & toys, of course, will always be happily and gratefully accepted! J Call for more information!

**EVENTS & TRIPS!** <http://www.bnl.gov/bera/recreation/events.asp>

\*Sam's Club, Costco, Book Fair, NY City Do-as-you-Please, Nutcracker Tickets, and more!

**BERA Holiday Party at the Crowne Plaza in Holtsville~ On Sale**  
**Friday 10/28!** \$60pp includes all:

Party is 7-12 midnight, open bar 7-11pm, Hors'd oeuvres, dinner buffet, dessert, dj, raffle prizes!

**BONUS!** Want to stay? Special \$79 + tax rate with breakfast!!

**Reserve your division Holiday Party space at the Rec Hall!**

The Rec Hall Lounge is cozy with couches, a piano, and a fire place and is suitable for about 25, or the Big Room can be set up with round tables/chairs 80.

Reservations are available for day or evening on Friday December 2, 9 & 16

(note that the BERA Holiday Party is off site for the evening of December 16<sup>th</sup>), and for day or evening on December 19, 20, 21, 22.

Please call 344-5090 or email [ccarter@bnl.gov](mailto:ccarter@bnl.gov) to reserve.

**THANKSGIVING:** Save the Date- Friday November 18 for the annual Hospitality Thanksgiving Dinner. Price of admission??? A donated new toy or canned food goods. Information below!



Dinner

Friday, November 18

at 5:30 P.M.

Recreation Building (#317)



***ENJOY A COMPLIMENTARY TRADITIONAL  
AMERICAN THANKSGIVING DINNER!***

Turkey and simple side dishes  
will be provided.

All guests are asked to bring a dessert or a  
beverage. Also, a donation for those in need is

required of either: a) *a new toy* or  
b) *2 canned food items.*

*Only those who register can participate!*

To register... Email [jpieniazek@bnl.gov](mailto:jpieniazek@bnl.gov) or call ext. 4894.  
Provide your name and number of guests.

Co-Sponsored by the Quality of Life Office and  
the English for Speakers of Other Languages Program

*Save the Date—December 19th 5 pm Holiday Party with Santa! (Date subject to change)*



**ALUMNI NEWS: AGS/RHIC/C-AD RETIRED CROWD - We'd enjoy hearing from you and what you have been up to. Please send your notes to [pmanning@bnl.gov](mailto:pmanning@bnl.gov)**

**You can catch up on all of Eric Forsyth's travels by clicking on his sailing yacht below.**



# November 2011

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
		1	2	3	4	5
		Anger Awareness Workshop, 12noon, Berkner, Room B				
6	7	8	9	10	11	12
Daylight Savings Time Ends		Election Day  Physics Colloquium "Atom Trap Trace Analysis", Prof. Zheng-Tian Lu, ANL, 3:30pm, Bldg. 555 Hamiton		BVA Flag Ceremony 12noon Center  BWIS Event "A step closer in the understanding of Alzheimer's Disease", Ya Ha, Yale, U., 4pm,	Veterans Day	

13	14	15 Physics Colloquium "Technicolor", Francesco Sannino, CP3-Or, 3:30pm, Bldg. 555 Hamiton	16	Berkner 17 Brookhaven Lecture "Synchrotron Radiation in Archaeology and Art", Eric Dooryhee, Photon, 4pm, Berkner	18	19
20	21	22 Physics Colloquium "Physics with Rare Isotope beams, an overview", Witold Nazarewicz, U. of TN, 3:30pm, Bldg. 555 Hamiton	23	24  Holiday	25 Holiday	26
27	28 Lunchtime Lecture, 12noon, Berkner, Room B	29 Physics Colloquium "The Mysteries of Cosmology", Michael Turner, 3:30pm, Bldg. 555 Hamiton	30 BSA Distinguished Lecture "Precision Measurement in Biology", Stephen Quake, Stanford U., 4pm, Berkner	1	2	3



# December 2011

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
				1	2	3
4	5 1-1-1 Fundraising Event, 11am, Berkner Lobby	6	7	8	9	10

11	12	13	14	15	16	17
18	19	20	21 <b>Happy Hanukkah</b>	22 Winter Begins	23 1/2 Holiday	24 Christmas Eve
25 Merry Christmas	26 Holiday 	27	28	29	30	31 New Year's Eve



**Editor:** Pamela Manning x4072

