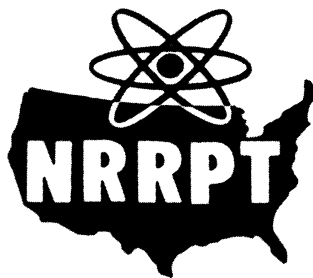


PRELIMINARY PROGRAM

American Radiation Safety Conference and Exposition

(Health Physics Society's 47th Annual Meeting)



*June 16-20, 2002
Tampa Convention Center
Tampa, Florida*

Health Physics Society Committee Meetings

Friday, June 14, 2002

ABHP BOARD MEETING

9:00 am - 5:00 pm

Saturday, June 15, 2002

FINANCE COMMITTEE

8:00 am - Noon

ABHP BOARD MEETING

9:00 am - Noon

CONTINUING EDUCATION COMMITTEE

Noon - 6:00 pm

SYMPOSIA COMMITTEE

1:00 - 5:00 pm

AAHP EXECUTIVE COMMITTEE

1:00 - 5:00 pm

HPS EXECUTIVE COMMITTEE

1:00 - 5:00 pm

Sunday, June 16, 2002

HPS BOARD OF DIRECTORS

8:00 am - 5:00 pm

VENUES COMMITTEE

8:30 am - 4:30 pm

AAHP EXECUTIVE COMMITTEE

9:00 am - Noon

SUMMER SCHOOL COMMITTEE

Noon - 3:00 pm

PROGRAM COMMITTEE

1:00 - 3:00 pm

AAHP STRATEGIC PLANNING WORKSHOP

2:00 - 5:00 pm

MENTORING PROGRAM

3:00 - 4:00 pm

Monday, June 17, 2002

HISTORY COMMITTEE

11:30 am - 1:30 pm

MEMBERSHIP COMMITTEE

Noon - 1:00 pm

PUBLICATIONS COMMITTEE

Noon - 2:00 pm

HEALTH PHYSICS PROGRAM DIRECTORS ORGANIZATION

Noon - 2:00 pm

RESEARCH NEEDS COMMITTEE

Noon - 2:00 pm

STRATEGIC PLANNING COMMITTEE

Noon - 3:00 pm

PUBLIC EDUCATION COMMITTEE

12:30 - 2:30 pm

CHAPTER COUNCIL MEETING

1:00 - 2:00 pm

SCIENTIFIC & PUBLIC ISSUES COMMITTEE

2:00 - 4:00 pm

AAHP PROFESSIONAL DEVELOPMENT COMMITTEE

2:00 - 4:00 pm

LIAISON COMMITTEE/LEADERSHIP FORUM

2:00 - 5:00 pm

STUDENT BRANCH OFFICERS

4:00 - 5:00 pm

INTERSOCIETY SHARING RESOURCES WORKSHOP

4:30 - 6:30 pm

Tuesday, June 18, 2002

ANSI N42.18 WORKING GROUP

8:30 - 11:30 am

LABORATORY ACCREDITATION POLICY

9:00 am - Noon

SCIENCE TEACHERS WORKSHOP COMMITTEE

Noon - 1:30 pm

LABORATORY ACCRED. ASSESSMENT

Noon - 2:30 pm

ANSI N13.32 WORKING GROUP

1:00 - 5:00 pm

ABET EVALUATORS AND AEC ACADEMIC ACCREDITATION SUBCOMMITTEE

2:00 - 4:00 pm

Wednesday, June 19, 2002

AFFILIATES COMMITTEE

7:30 - 9:30 am

HPS WEB SITE EDITORS

Noon - 3:00 pm

ACADEMIC EDUCATION COMMITTEE

2:00 - 4:00 pm

Thursday, June 20, 2002

LOCAL ARRANGEMENTS COMMITTEE

7:30 - 9:30 am

HPSSC/N13/N43 MEETING

8:00 am - Noon

HPS BOARD OF DIRECTORS

8:00 am - Noon

ACADEMIC EDUCATION COMMITTEE SPONSORSHIP/ROUNDTABLE DISCUSSION

9:00 - 11:00 am

PROGRAM COMMITTEE

Noon - 3:30 pm

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Key Dates

Current Events/Works-In-Progress Deadline	May 3
Hotel Registration Deadline	May 14
Social/Technical Preregistration Deadline	May 14
HPS Annual Meeting Preregistration Deadline	May 14
PEP Preregistration Deadline	May 14
Summer School Registration Deadline	May 15
Summer School, University of Florida, Gainesville, FL	June 10-14
Professional Enrichment Program	June 16-20
ARSCE/HPS 47th Annual Meeting	June 16-20
American Board of Health Physics Written Exam	June 17

Registration Hours

Registration will take place at the Tampa Marriott and Tampa Convention Center. See Below.

Registration at the Tampa Marriott:

Saturday, June 15	2:00 - 5:00 pm
Sunday, June 16	7:00 am - 7:00 pm

Registration at the Tampa Convention Center:

Monday, June 17	8:00 am - 4:00 pm
Tuesday, June 18	8:00 am - 4:00 pm
Wednesday, June 19	8:00 am - 4:00 pm
Thursday, June 20	8:00 am - Noon

Saturday, June 15

AAHP 1
Radioactivity in Recycled Materials and Municipal and Residual Waste. *Tony LaMastra, Health Physics Associates, Inc.*
8:00 am - 5:00 pm *Marriott*

AAHP 2
Food Irradiation Technology. *Daniel L. Engeljohn, US Department of Agriculture, Washington, DC*
8:00 am - 5:00 pm *Marriott*

AAHP 3
Application of ANSI/HPS N13.1-1999: Sampling and Monitoring Releases of Airborne Radioactive Substances from the Stacks and Ducts of Nuclear Facilities. *John Glissmeyer, Pacific Northwest National Laboratory*
8:00 am - 5:00 pm *Marriott*

Sunday, June 16

PEP **1-A thru 1-J**
8:00 - 10:00 am

PEP **2-A thru 2-J**
10:30 am - 12:30 pm

PEP **3-A thru 3-J**
2:00 - 4:00 pm

All Sunday PEPs will be held at the Tampa Marriott

Welcome Reception
6:00 - 7:30 pm *Marriott*

Monday and Wednesday Plenaries in Convention Center Ballroom

Monday - Thursday All Technical Sessions and PEPs will be held at the Convention Center

Monday, June 17

CEL-1 Backgrounds, Detection Limits, and Treatment of Uncertainties in Survey Data
7:15 - 8:15 AM *Room: CC 18/19*

CEL-2 The Oklo Natural Nuclear Reactor
7:15 - 8:15 AM *Room: CC 20/21*

ABHP Exam - Part I
8:00 - 11:00 am *Marriott Florida Ballroom V & VI*

MAM-A Plenary Session
8:30 am - Noon *CC Ballroom A/B*

Lunch in Exhibit Hall for all Registrants and Opening of Exhibits
Noon - 1:30 pm *West Exhibit Hall*

PEP Program
12:15-2:15 PM

M-1 Is Radiation an Essential Trace Energy?

M-2 Coronary Artery Radiation Therapy [CART].

M-3 ICRP 66 Respiratory Tract Model.

M-4 Public and Scholarly Perceptions of Radiation Risks.

M-5 Role of the Health Physicist in Radiation Accident Management.

M-6 Technical Basis for an Internal Dose Program.

ABHP Exam - Part II
12:30 - 6:30 pm *Marriott Florida Ballroom V & VI*

HPS Chapter Council
1:00 - 2:00 pm *TBD*

Poster Session
1:30 - 3:00 pm *CC Exhibit Hall*

MPM-A MPM-A: Medical HP and RSO Section Session: Doses from Medical Procedures-Special Concerns for Women and Children
3:00 - 5:00 pm *CC Ballroom A/B*

MPM-B External Dosimetry
3:00 - 4:30 pm *CC 20/21*

MPM-C Operational Health Physics
3:00 - 4:30 pm *CC 22/23*

MPM-D Radiological Security/Emergency Planning/Response
3:00 - 5:30 pm *CC 24/25*

MPM-E Biokinetics/Bioeffects
3:00 - 4:45 pm *CC 18/19*

Student Reception
5:30 - 6:30 pm *Marriott*

Current Issues in HP Instrumentation
6:00 - 8:00 pm *Marriott*

Tuesday, June 18

CEL-3 Radiation Protection Quantities: A Critique
7:15 - 8:15 AM *Room: CC 18/19*

CEL-4 Radiation Accident History
7:15 - 8:15 AM *Room: CC 20/21*

TAM-A AAHP Special Session: Accidents in the Nuclear Industry; Impacts and Lessons Learned
8:30 am - Noon *CC 18/19*

TAM-B Depleted Uranium Aerosol Characterization: Applicability to Soldier Exposure Assessment
8:30 am - Noon *CC 20/21*

TAM-C Accelerator Section Session
8:30 am - Noon *CC 22/23*

TAM-D Medical HP Section Session: 21st Century - The Century of Medical Science
8:30 - 10:00 am *CC 24/25*

Medical HP Section Meeting
10:30 am *CC 24/25*

Accelerator Section Meeting
Noon *CC 22/23*

AAHP Awards Luncheon
Noon - 1:30 pm *Convention Center*

PEP Program
12:15-2:15 PM

T-1 Revisions in Internal Radiation Dosimetry; ICRP Publication 68

T-2 Medical Management of Patients Vis-a-Vis Radiological Terrorist Events

T-3 Steering a Course Through the Regulatory Maze

T-4 The Art and Science of "Selling" Your Radiation Safety Program

T-5 Use of MARSSIM for Decommissioning Medical Facilities

T-6 Effective Communication Tools for Improved Radiation Safety Programs

TPM-A AAHP Special Session: Accidents in the Nuclear Industry; Impacts of Lessons Learned
2:30 - 5:00 pm *CC 18/19*

TPM-B Biokinetics/Bioeffects of the Actinides
2:15 - 5:45 pm *CC 20/21*

TPM-C Environmental
2:30 - 3:30 pm *CC 22/23*

TPM-C Decommissioning
4:00 - 5:45 pm *CC 22/23*

TPM-D Medical Health Physics
2:30 - 5:00 pm *CC 24/25*

Decommissioning Section Meeting
2:30 pm *Room: CC 3/4*

Radon Section Meeting
4:00 pm *Room: CC 5/6*

AAHP Open Meeting
5:00 pm *CC 18/19*

HPS Awards Reception and Dinner
7:00 - 10:00 pm *Tampa Marriott*

Wednesday, June 19

CEL-5 Updated Internal Radiation Dosimetry; ICRP Publication 68
7:15 - 8:15 AM Room: CC 18/19

CEL-6 Depleted Uranium, Why Public Concern Is So Great?
7:15 - 8:15 AM Room: CC 20/21

WAM-A Government, Medical Health Physics, and RSO Section Plenary Session: Symposium on Homeland Security
8:30 am - Noon CC Ballroom A/B

PEP Program
12:15-2:15 PM

W-1 How to Have Fun Teaching Kids and Adults about Radiation

W-2 Obtaining Optimal Image Quality and Minimal Patient Dose in X-ray Imaging

W-3 Introduction to Non-Ionizing Radiation Safety: Practical Strategies

W-4 A Risk Management & Insurance Primer for Institutional Health Physicists

W-5 University Medical Center Radiation Safety Programs

W-6 Calculating and Reporting Fetal Radiation Exposure from Medical Procedures

WPM-A Government, Medical Health Physics, and RSO Section Session: Symposium on Homeland Security
2:30 - 5:45 pm CC Ballroom A/B

WPM-B MARLAP
2:30 - 5:30 pm CC 20/21

WPM-C Radionuclide NESHAPs
2:30 - 3:45 pm CC 22/23

WPM-D Medical HP Section Session: Shielding for Medical Facilities
2:30 - 4:00 pm CC 24/25

WPM-D Medical HP and Government Section Session: Regulation in Medicine
4:30 - 5:30 pm CC 24/25

WPM-E Regulatory/Legal Issues
2:30 - 3:30 pm CC 18/19

WPM-E Waste Management
4:00 - 5:00 pm CC 18/19

Joint Radionuclide NESHAPs Annual Mtg
4:15 pm CC 22/23

HPS Business Meeting
5:45 - 6:30 pm Room: CC 24/25

Aerosol Measurements
6:30 - 8:30 pm Marriott

Thursday, June 20

CEL-7 Basics of PET
7:15 - 8:15 AM Room: CC 18/19

CEL-8 Current Status of Agents used in Nuclear Medicine Therapy
7:15 - 8:15 AM Room: CC 20/21

THAM-A Probability of Causation
8:30 - Noon CC 18/19

THAM-B Our Role in Reducing Terror from a Radiological Incident
8:30 - Noon CC 20/21

THAM-C RSO Section Session
8:30 - 11:15 am CC 22/23

THAM-D The History and Development of Portable Gamma Spectrometers: Use and Practical Applications
8:30 - 11:15 am CC 24/25

RSO Section Meeting
11:15 am Room: CC 22/23

PEP Program
12:15-2:15 PM

TH-1 Radiation Safety in Brachytherapy

TH-2 Back to Nature: The Sources and Origins of NORM

TH-3 Medical Internal Dose Calculations - Current Practice and Future Trends

TH-4 Subsurface Radiological Characterization

TH-5 Obtaining Optimal Myocardial Perfusion Images with Minimal Patient Dose

TH-6 Patient Radiation Safety and Fluoroscopy

Registration Hours

Saturday 2:00 - 5:00 pm
Tampa Marriott

Sunday 7:00 am - 7:00 pm
Tampa Marriott

Monday 8:00 am - 4:00 pm
Tampa Convention Center

Tuesday 8:00 am - 4:00 pm
Tampa Convention Center

Wednesday 8:00 am - 4:00 pm
Tampa Convention Center

Thursday 8:00 am - Noon
Tampa Convention Center

Exhibit Hall Hours

Convention Center

Monday Noon - 5:00 pm

Tuesday 9:30 am - 5:00 pm

Wednesday 9:30 am - Noon

Important Events!

Welcome Reception

The Welcome Reception will be held Sunday, June 16 from 6–7:30 pm at the Tampa Marriott.

Exhibits

Free Lunch! Free Lunch! – Noon, Monday, June 17. All registered attendees are invited to attend a complimentary lunch in the exhibit hall immediately following the Plenary Session.

Breaks Monday Afternoon-Wednesday Afternoon – Featuring morning Continental Breakfasts and afternoon refreshments such as ice cream and cookies. Be sure to stop by and visit with the exhibitors while enjoying your refreshments!

Sessions

Saturday – AAHP Courses will be held in the Tampa Marriott.

Sunday – PEP Sessions will be held in the Tampa Marriott.

Monday - Thursday - PEP Sessions will be held in the Tampa Convention Center.

Monday – Plenary Session will be held in the Tampa Convention Center Ballroom A/B.

Monday –Thursday – All Technical Sessions and PEPs will be held in the Tampa Convention Center.

Different this Year!

Tuesday Evening Awards Reception and Banquet at the Tampa Waterside Marriott 7:00 - 10:00 pm

Online registration available by April 15

Things to Remember!

All posters up Monday–Wednesday in Exhibit Hall

Poster Session featured Monday, 1:30-3:00 pm – No other sessions at that time

PEP Refund Policy – See page 31

Computer projection available for one designated technical session each day.

Registration Policy: Unless appropriate check/charge information accompanies your form, you will NOT be considered preregistered.

Meeting Refund Policy: Request for refunds will be honored **if received in writing by May 14**. All refunds will be issued **AFTER** the meeting and will be subject to a **\$35.00 processing fee**. **NO REFUNDS WILL BE ISSUED AT THE MEETING**. Refunds will not be issued to no-shows.

AAHP Awards Luncheon

The AAHP is sponsoring an Awards Luncheon on Tuesday, June 18, from Noon-1:30 pm.

The following rate structure will apply:

- 1) Persons certified in 2001 Free
- 2) CHPs other than #1 \$10.00
- 3) Guests and others wishing to attend \$15.00

To sign up for the Luncheon, use the Registration form in the back of this Preliminary Program.

HPS TAMPA 2002



WELCOME

The Florida Chapter of the Health Physics Society and the City of Tampa, Florida will host the 2002 American Radiation Safety Conference and Exposition (ARSCE) and the 47th Annual Meeting of the Health Physics Society. The ARSCE will be held from June 16 through June 20 at the Tampa Convention Center. Come and enjoy the many exciting activities that Tampa offers while learning about the latest developments in radiation safety.

TAMPA

Tampa is located on Tampa Bay and the Hillsborough River. Incorporated on December 15, 1855, Tampa was first visited by the Spanish explorer Ponce de Leon in 1513. The first American settler arrived in 1824. During the Civil War, Tampa Bay harbor was blockaded, and the Union Army occupied the city. In the late 1880s, phosphate was discovered nearby and the resulting mining and shipping activities prompted the growth that made the Tampa port the seventh largest in the nation. Today Tampa is a modern city offering a variety of outdoor and indoor activities for people of all ages. With something for everyone, Tampa is a popular family vacation destination throughout the year.

WEATHER

While Tampa Bay's weather is a refreshing change any time of year, this area does have subtle changes of season. But the key to Tampa Bay is comfort. Just imagine gentle bay breezes, a blanket of sunshine and swaying palms while you pack. In the summer months the high temperature can reach 90 degrees but remains comfortable with a sea breeze off the bay and occasional brief afternoon showers. Don't forget to throw in some comfortable shoes for visiting Tampa Bay's many attractions and some sunscreen rated SPF 15 or higher to protect your skin from Tampa Bay's most popular attraction — the sun.

LODGING

The meeting hotels for the 2002 ARSCE are the Tampa Marriott Waterside (see page 51 for Marriott form and on line reservation information) and the Wyndham Harbour Island Hotel. Both are within ready walking distance of the Convention Center. The Tampa Marriot Waterside Hotel will be the conference headquarters and is located immediately adjacent to the Convention Center. The Wyndham Harbour Island Hotel is just a stroll across a short bridge to the Convention Center. Each hotel has their own parking facilities and daily rates are reasonable for downtown in a large city, approximately \$12 per day for valet service, or \$5 per day for self parking.

Be sure to mention the Health Physics Society Meeting when making reservations.

Tampa Marriott Waterside	\$138 Single/Double
Wyndham Harbour Island	\$131 Single/Double

Reservations: 888-268-1616 or 813-221-4900
Reservations: 800-996-3426 or 813-229-5000

TRANSPORTATION

The Tampa Marriott Waterside Hotel has arranged for Airport Shuttle Service through The Limo Inc. This is a first stop/last stop service. Call 1-800-282-6817 at least 24 hours in advance to arrange for service and identify yourself as an HPS attendee. At the airport, you will exit on either end of the terminal on the baggage claim level and check in with The Limo Inc. booth dispatcher. The pre-paid rate to/from the Marriott Waterside Hotel is \$10.00 per person each way or \$18.00 round trip. Taxicab service is provided by either United Cab or Tampa Yellow for approximately \$16. For the Wyndham Harbour Island Hotel, both of these options are available, but the Wyndham also offers a complimentary shuttle that runs every half-hour from 7am - 10 pm. Arriving guests can call the hotel from the complimentary phones in the baggage claim area to get the latest pick-up times and coordinate their pick-up location in the terminal.

HOSPITALITY SUITE

A Hospitality Suite will be available in Meeting Room 11 on Level Three of the Tampa Marriott Waterside Hotel. Come meet old friends and relax on the terrace as you learn about the attractions in the Tampa area. Local citizens with literature about the city and environs will be on hand to help attendees plan their do-it-on-your-own family activities described further in the program. On Monday morning from 8:00 AM to 9:00 AM, prior to the departure of the City Tour, we invite all registered companions to an official welcome from the meeting's tour representative, Florida Destinations & Incentives, who will provide an orientation to Tampa and answer any questions you may have.

Continental breakfast will be available Monday through Wednesday mornings for registered companions, as will afternoon refreshments if attendance dictates. Breakfast and refreshments are available to nonregistered companions on a per item cash basis or several restaurants are available within the hotel.

CHILDCARE

You can make arrangements for childcare as necessary. The rates per hour depend upon the situation.

The Marriott Waterside Hotel recommends:

Resort Babysitters 1-800-788-6689 or 1-727-865-0061

The Wyndham Harbour Island Hotel does not endorse or assume responsibility for any childcare arrangements; however, prior guests have utilized the following services:

A Choice Nanny 1-727-254-8687

Barbara McClellan 1-727-985-5231

Pat Collings Babysitting Agency 1-727-837-5874

Resort Babysitters 1-800-788-6689 or 1-727-865-0061

Ski 1-727-625-9753

TUESDAY NIGHT AWARDS BANQUET - CAPTURE THE MAGIC

It's a magical night! Strolling magicians greet attendees with sleight of hand tricks as they enter a magical world! A plush drapery proscenium rises and stars are in the sky (and on the stage) for this illustrious evening. Brief award presentations will immediately follow the dinner. All attendees are strongly encouraged to stay and show your support for the award recipients. This event will take place in the Tampa Marriott from 7:00 - 10:00 pm.

Tours....Events....Tours....Events....Tours....Events....Tours....Events....Tours

Sunday, June 16

TREASURES OF TAMPA CITY TOUR

11:45 AM – 3:45 PM

Preregistration \$39/Onsite \$44

Explore Historic Tampa during this engaging City Tour. Buses will make stops at the University of Tampa / Henry B. Plant Museum and the Old Hyde Park Shopping District. The tour will also include a narrated ride through Hyde Park and down Bayshore Boulevard, the celebrated 8-mile recreation path along Tampa Bay. Our stop at the University of Tampa will allow time to explore their fascinating museum. In 1891, Henry Bradley Plant, a wealthy industrialist, completed the Tampa Bay Hotel after two years of construction and a cost of 2.5 million dollars. The hotel, covering six acres with 511 rooms, was one-quarter mile long and sat on 150 acres of grounds with all the amenities of the period including a golf course, tennis courts, stables, racetrack and kennels. In 1974, the Henry B. Plant Museum was established, complete with original furnishings and art objects collected by Mr. And Mrs. Plant in Europe and the Orient. The museum was featured in a recent Antiques Road Show. The stop in Hyde Park will allow several hours of shopping time. Guests can sightsee and shop in some of Florida's most historic areas. Old Hyde Park Village boasts a collection of 65 select shops and lunch establishments nestled in one of Tampa's finest old neighborhoods. With its splendid array of fashions from classic to contemporary, and accessories for gifts or for home, Old Hyde Park Village is a Tampa tradition to explore.

Monday, June 17

TREASURES OF TAMPA CITY TOUR

9:45 AM – 2:45 PM

Preregistration \$39/Onsite \$44

Similar to the City Tour described above for Sunday, June 16, except the Ybor City State Museum is substituted for the University of Tampa / Henry B. Plant Museum on the Monday tour. The museum explores the rich history of Ybor City and the cigar rolling industry that created the area. Cigar rollers are on hand and museum guides are available to give life to the history exhibited.

Monday, June 17

MARINE ECO-TOUR

10:00 AM – 3:00 PM

Preregistration \$47/Onsite \$57

The Marine Eco-Tour offers a unique opportunity to experience the natural surroundings of Tampa Bay. We begin this day with a quick trip to the Clearwater Marine Aquarium known for its rescue and rehabilitative work with sick or injured marine animals. Guests will be treated to a 15-minute presentation by "Panama," the resident Bottle-nose Dolphin.

After the presentation, we'll board a pontoon boat for a Sea-life Safari through the intra-coastal waters of Clearwater. Marine biologists will guide guests on the search for Dolphins, Sea Birds, and other local marine life. A stop at one of the spoil islands will provide the opportunity for shelling and guests, armed with nets, to catch & release small native marine life for the Biologist's review of their specimen. During this outing, Biologists will also provide a bit of local history as well as the human impact on our local area. Program includes boxed lunch to include a 6" turkey sub sandwich, chips, fruit, and bottled water & sodas.

Tours....Events....Tours....Events....Tours....Events....Tours....Events....Tours

Tuesday, June 18

GOLF AT EAGLES GOLF COURSE

6:00 AM – 1:00 PM (tee times starting at 7am)

Preregistration \$70/Onsite \$80

The Eagles Golf Club boasts 36 holes of the most challenging golf in the Tampa Bay area. The Ron Garl-designed Forest and Lakes Courses have large elevated greens with many challenges provided by the water, bunkers and large stately oak trees. This is truly a golfer's paradise. The Eagles offers "Pro Shot Satellite Technology". This computerized display unit mounted in the golf cart, offers consistent up-dates for the exact yardage to the center, back and front of the Green, key hazards you should be aware of, tips on how to play that particular hole and which club to use. USGA Rating/Slope 72.5/121 Lakes.

Tuesday, June 18



5K FUN RUN / WALK

6:30 AM – 8:30 AM

Preregistration \$25/Onsite \$30

Tampa's Bayshore Boulevard is the location of the 5K run. A short bus ride from the Convention Center will transport runners to the starting gate. Participants return along the spacious jogging path along Bayshore Boulevard, offering a beautiful view of downtown Tampa, Tampa Bay, and the Hillsborough River, ending a stone throw from the Convention Center at the landmark pirate ship.

Tuesday, June 18

RINGLING MUSEUM OF ART / PRIME OUTLET SHOPPING

9:00 AM – 5:00 PM

Preregistration \$42/Onsite \$52

The John and Mable Ringling Museum of Art is a pink Italian Renaissance villa, replete with fountains, friezes, cartouches, vaults and columns. Here, guests will experience a pageant of over 500 years of European and American art, including one of the world's most important collections of grand 17th century Baroque paintings. At the heart of the Museum's collection, guests will find magnificent paintings by Rubens, Van Dyck, Velazquea, Frans Hals, Poussin, Veronese, and Tiepolo. A Museum Docent will guide guests through the Art Galleries for an insightful look at the featured pieces. Guests will then be free to explore the wonders of the Circus Galleries at their leisure. Museum Guides will be available in the Circus Gallery to answer questions. The Ca'd'Zan, the Ringling's Winter Home, is in the final phases of an extensive renovation and is scheduled to be re-opened by this tour. During their visit to the Ringling Museum, guests will be on their own to enjoy lunch at the Museum's Banyan Café.

Guests will then be able to shop 'til they drop at Prime Outlets. Over 100 beautiful outlets including accessories, women and men's apparel, children's apparel, shoes, specialty items, electronics and housewares await your guests. Names such as Liz Claiborne, Gap, Sunglass Hut, Express, Bugle Boy, Off Saks Fifth Avenue, Ann Taylor, Carole Little, Casual Corner Outlet, Ellen Tracy, Brooks Brothers, Ralph Lauren, Carter's, Osh Kosh B'Gosh, even Black and Decker, will be recognized. As guests arrive, they will be met by a Mall Representative who will distribute shopping bags, coupon books featuring additional savings at many of the stores, and mall directories. Also located at the Mall is a food gallery filled with a variety of American and ethnic choices.

Wednesday, June 19

GOLF AT THE TOURNAMENT PLAYERS CLUB OF TAMPA BAY



9:00 AM – 4:00 PM (tee times starting at 10 am)

Preregistration \$93/Onsite \$103

The Tournament Players Club of Tampa Bay is the area's premier golf facility. This course is the annual host of the GTE Classic, one of the most successful events on the Senior PGA Tour and was designed by Robert Weed, with Senior PGA Tour star ChiChi Rodriguez serving as player consultant. Playing to a Par 71, the 18-hole Stadium(R) golf course ranges in yardage from 5036 from the red tees to 6898 from the championship tees to challenge the best of the Senior PGA Tour, while providing a memorable golfing experience for players of all abilities. The TPC of Tampa Bay has a USGA Rating / Slope of 71.9 / 126 and features fourteen lakes and eighty-three bunkers, with many of the holes winding through a cypress marsh left in its natural state. Come play like a pro.

Wednesday, June 19

COOK LIKE A CHEF

11:30 AM – 3:30 PM

Preregistration \$57/Onsite \$67

Always wished you could cook like Julia Child or Emeril? Now's your chance. SideBern's, sister restaurant of Tampa's famous Bern's Steak House, has gone global. Chef Jeannie Pierola's cutting edge culinary style and food experience is what she calls One World Cuisine. The new One World Cuisine is a global sampling of influences from around the world - including Asia, France, Africa, Latin America and the Mediterranean. SideBern's will be opened specifically for HPS tour attendees to participate in an interactive cooking class. Chef Pierola will provide an educational / interactive cooking class that will include consumption of an appetizer, an entrée and a savory dessert. Who can resist?

Wednesday, June 19

YBOR CITY PUB CRAWL



7:00 PM – 11:00 PM

Preregistration \$15/Onsite \$20

Experience the cultural & historical sights, shops, restaurants, events and nightlife that Ybor City has to offer in a unique way. Whether you are a history buff, cigar aficionado or simply looking for "Florida's Latin Quarter Experience", the Ybor City Pub Crawl is just for you! Quaint yellow trolleys will run a private shuttle route for the evening – just for HP conference attendees. Each guest is provided a custom printed coupon book with coupons for some of the best spots along 7th Avenue, so try out a few different places! University alumni looking for a great night out? This evening is a great opportunity for groups, or anyone, who want to spend some free time after the day's meetings in Florida's hottest nightspot!

Technical Tours....Technical Tours....Technical Tours....Technical Tours

Monday, June 17

TECHNICAL TOUR TO CONSTELLATION TECHNOLOGY CORPORATION

9:00 AM – 12:00 NOON

Preregistration \$15/Onsite \$18

Visit an industrial facility known internationally for the development and commercialization of the Mercuric Iodide radiation detector as well as nuclear non-proliferation instrumentation. Tour a commercial calibration facility and analytical laboratory with up-to-date and comprehensive equipment and sources. Citizenship information required by May 15 - see registration form page 55.

Tuesday, June 18

TECHNICAL TOUR TO FOOD TECHNOLOGY SERVICE, INC. INDUSTRIAL IRRADIATOR

10:00 AM – 3:00 PM

Preregistration \$18/Onsite \$20

Food irradiation is a technology for controlling the microbiological contamination that causes food-borne illness and food losses due to spoilage. It is effective for use in a wide variety of food products, from fresh fruit and vegetables to spices, chicken, and red meat. MDS Nordion is involved with many food irradiation facilities around the world. In 1992, the first dedicated food irradiator was operational in Mulberry, Florida, which holds a unique position as the only pallet irradiation processing company totally dedicated to the food industry. Come tour the facility that has a processing capacity of up to 200 million pounds of product per year based on a 1 million Curie Cobalt-60 gamma irradiator. Casual clothing is recommended; each individual will need to sign in and out.

Wednesday, June 19

ON-SITE TECHNICAL TOUR OF MERL (Mobile Emergency Radiological Laboratory)

12:00 NOON – 4:30 PM

No Charge

The State of Florida Department of Health Bureau of Radiation Control responds to all radiation incidents and emergencies, including unexpected radiation releases from nuclear power plants, transportation accidents, lost or stolen radioactive sources, and contamination of a facility or the environment. To prepare for these incidents, the department trains its staff and other emergency personnel in emergency response and decontamination procedures and dose assessment. Staff also learn how to respond to nuclear reactor emergencies during six annual training exercises at the state's nuclear power plants. In addition, the department provides the Kennedy Space Center with emergency response assistance during the launch of spacecraft containing radioactive material, such as the Ulysses, Galileo and recent Cassini space probes. A key component to their response is MERL, a state-of-the-art mobile response van. Follow-up the Symposium on Homeland Security with a tour!

Wednesday, June 19

TECHNICAL TOUR TO P.E.T.NET CYCLOTRON

1:00 PM – 3:00 PM

Preregistration \$15/Onsite \$18

P.E.T.Net® Pharmaceuticals, Inc. owns and operates the P.E.T.Net® Positron Radiopharmacy Network™ of manufacturing and distribution centers where PET radiopharmaceuticals are produced and distributed to nearby hospitals and clinics for use in PET imaging. An excellent follow-up to the medical sessions, this is a "you've got to see it to believe it" tour. Dress casually. Participants will need to sign in and out, but no social security number is necessary. They will not allow any "known terrorist" to tour the facility.

Thursday, June 20

ON-SITE TECHNICAL TOUR OF MERL

8:30 AM – 12:00 NOON

No Charge

See description for Tour of MERL on Wednesday, June 19.

FAMILY ACTIVITIES

So many things to do and so little time...

DISCOUNTED TICKETS FOR THEME PARKS AND ATTRACTIONS

Discounted tickets may be purchased for the following attractions. Use the registration form on the inside back cover to order tickets. Please note that tickets will be available for pick up beginning Saturday, June 16 from 2:00 - 5:00 pm and every day throughout the meeting. If you will need your tickets prior to June 16 at 2:00 pm, contact Sue Burk (sburk@burkinc.com or 703-790-1745) at HPS Headquarters to arrange for special coordination.

CYPRESS GARDENS

Hours: 9:30 am - 5:00 pm

Go to www.cypressgardens.com for more information.

Regular price (including tax)	Adult \$37.05	Child (6-17 years) \$21.15
HPS Discounted price (including tax)	Adult \$28.50	Child (6-17 years) \$14.66
	Seniors \$27.38 (55+, no Senior ticket available at gate)	

FLORIDA AQUARIUM

Hours: 9:30 am - 5:00 pm

The world class Florida Aquarium is only a five-minute walk from the Marriott. Visit the three-story, glass-domed aquarium any day during the week of the meeting. Four galleries covering the four different ecosystems of Florida are showcased. A tour of the Wetlands will begin your adventure upon entering the limestone caverns, then experience a cypress swamp, mangrove roots and a river containing live otters. The next stop is the Bays and Beaches, which contains saltwater and freshwater displays. Next are the Coral Reefs, which take you on a simulated 60-foot dive, then on to deeper waters, where a new attraction called Sea Hunt features ocean predators from around the world, and octopus or sharks cruise by swimming sea turtles. A new kid-friendly interactive exhibit called No BoneZone was recently unveiled. No BoneZone is especially designed for the younger marine enthusiast, with low tanks and plenty of hands-on opportunities. The main feature is the S.C.U.M. touch tank - a 600-gallon tank where visitors can touch sea stars, crabs, urchins, mollusks and other invertebrates from the world's oceans. Go to www.flaquarium.org for more information.

Regular price	Adult \$15.00	Child (5-12 years) \$10.00	Senior (60+) \$12.00
HPS Discounted price	Adult/Senior \$9.75	Child (5-12 years) \$6.00	

SALVADOR DALI MUSEUM

*Hours: Monday-Saturday, 9:30 am - 5:30 pm; Sunday, Noon - 5:30 pm
Thursday, until 8:00 pm*

See the largest collection of Dali works in North America. Docents are available to explain how and when the collection arrived in St. Petersburg and describe some interesting anecdotes about the paintings, his life and influences on his work.

Regular price (including tax)	Adult \$10.00	Student (10-College) \$5.00	Senior (65+) \$7.00
HPS Discounted price (including tax)	Adult \$7.00	Student (10-College) \$2.00	Senior (65+) \$5.00

UNIVERSAL ORLANDO

Monday-Saturday, 9:00 am - 8:00 pm

www.universalorlando.com

Sunday 6/16, 9:00 am - 7:00 pm; Sunday 6/23, 9:00 am - 9:00 pm

HPS Discounted price - 1 Day 1 Park	Adult \$47.66	Child (3-9 years) \$39.08
HPS Discounted price - 2 Day 2 Park	Adult \$96.41	Child (3-9 years) \$82.63

ONLINE OR WITH YOUR BADGE

BUSCH GARDENS

Hours: Monday - Saturday, 9:00 am - 7:00 pm; Sunday, 9:00 am - 7:30 pm

Go to www.buschgardens.com for more information. With your badge and coupon available at the HPS Registration Desk, tickets are \$42.80 all day; \$32.10 after 2:00 pm.

Regular price (including tax)	Adult \$53.44	Child (3-9 years) \$43.81
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DISNEY ORLANDO

For advance purchase of exclusive, specially-priced Disney PARK HOPPER® Meeting/Convention Theme Park tickets, go to <https://secure.hes-services.com/WDWTicket/amradiation.asp>. These tickets are ONLY available online. Use the HPS website under Conferences for a direct link to this site. The order CUT-OFF date for shipment of tickets is June 3, 2002. A limited number of discounted tickets will be available at the HPS Registration Desk during the meeting.

SEA-WORLD ORLANDO

Hours: 9:00 am - 10:00 pm

"Show your Badge and Save" at the Guest Relations area of the gate. **Attendees and up to 5 guests each are \$36.00 per adult or child.** Tickets are good from Noon - 9:00 pm each day. Also, second day is at no charge within a 7 day period. Go to www.seaworld.com for more information.

Regular price (including tax)	Adult \$52.95	Child \$43.41
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OTHER ACTIVITIES

Visit the Hospitality Suite (Marriott, Room 11, Third Floor) to help you arrange these activities.

No discounts available:

BOK TOWER GARDENS

Hours: 8:00 am - 6:00 pm

Bok Tower Gardens, located on the highest hill in Central Florida, near Lake Wales, is an easy fifty-mile drive east of Tampa. In clear weather, visibility is purported to be forty miles. Named after Edward William Bok, American editor, philanthropist and Pulitzer Prize winning author, the Gardens was dedicated by President Calvin Coolidge, February 1, 1929. The famous landscape architect, Frederick Law Olmsted, Jr., who also helped design Central Park in New York City, designed the 157-acre Woodland Garden. Included in the design are two ponds and a reflecting pool for the tower. The Gardens is home to many endangered species. Bok also commissioned Philadelphia architect Milton B. Medary to design and build a carillon tower on the grounds. Go to www.boktower.org.

Regular price

Adult \$6.00

Child (5-12) \$2.00

KENNEDY SPACE CENTER

Hours: 9:00 am - 5:30 pm

Explore America's space heritage with an awe-inspiring visit to the Kennedy Space Center. Guests to the Visitors Complex now have the opportunity to come face-to-face with a real astronaut. A walk-through exhibit provides visitors with a comprehensive history of key missions that provided the foundation for the current space program. Highlights include actual Mercury Mission Control consoles and components and authentic Mercury and Gemini capsules. Two films take you on a journey into space on IMAX screens over five stories tall, with dramatic footage photographed in space by the astronauts giving you a feeling of being there! Go to www.kennedyspacecenter.com.

Regular price

Adult \$26.00 + tax

Child (3-11) \$16.00 + tax

LOWRY PARK ZOO

Hours: 9:30 am - 5:00 pm

Lowry Park Zoo is one of the top three mid-sized zoos in the country. It features 41 acres of lush, natural habitats comprising these main exhibit areas: Florida Manatee and Aquatic Center, Native Florida Wildlife Center, Asia Domain, Primate World, Free-Flight Aviary and Children's Petting Zoo. The newest feature is Stingray Bay where you can actually stick your hands in the water and touch and feed the stingrays (the barbs have been removed by the veterinary staff.) Go to www.lowryparkzoo.com for more information.

Regular price

Adult \$9.50

Child (3-11) \$5.95

Senior (50+) \$8.50

MOSI

Hours: 9:00 am - 5:00 pm

The exciting Museum of Science and Industry is where science comes to life with a hands-on environment. Step into a 74 mph impact Gulf Coast hurricane and step out with a tangible memory of gale force winds. Stroll through the free-flying Butterfly Encounter or dive into the mysterious world of microbes in Lifelab. "The Amazing You" takes one through the human body in all its complexity. Born out of tragedy, the Challenger Learning Center is a living memorial to the crew of the shuttle orbiter Challenger. Go to www.mosi.org for more information and \$2.00 online coupons.

Regular price

Adult \$13.95

Child (2-12) \$9.95

Senior (60+) \$11.95

ON YOUR OWN ACTIVITIES

Visit the Hospitality Suite to help you arrange these on-your-own activities.

CANOE/KAYAK

Imagine the excitement of floating down a river in a canoe or kayak with the tropical surrounding of Spanish moss hanging so picturesque from trees and each turn in the river an inspiring adventure. Commune with nature and see the real Florida, with perhaps a glimpse of alligators resting along the shore and other wild birds in the trees above. Whether you are an avid canoeist/kayaker or just out for a day of fun, enjoy the outstanding Florida waterways.

DUCK TOURS

Hours: Closed Monday-Tuesday; Wednesday - Sunday Tour Times: 11am, 1pm, 3pm, 4:45pm

The Ducks are 2½ ton amphibian ex-military trucks that will splash into Tampa Bay for a scenic water adventure before touring the surrounding areas of downtown Tampa. Each of the Duck vehicles is a 1940's original that has been carefully restored and repainted a bright yellow with a canopy added so Duck tour riders are considerably more comfortable than the GI's used to be! Ducks depart from Newk's Cafe, very close to the Tampa Convention Center. Ducks go to historic Ybor City, University of Tampa, Davis Island, Harbour Island. Visit the website: www.DuckToursofTampaBay.com.

FISHING

Deep-sea fishing on one of the local charter boats is a day to remember. Anglers reach fishing grounds quickly and get considerable fishing time along the coast. The coastal waters off the west coast of Florida consistently produce great catches of grouper, snapper, sea bass, amberjack, shark, cobia, bonita and much more. Arrangements can be made with local restaurants to cook the catch and a taxidermy service can be referred.

If you prefer inshore fishing, try one of the local guides to the Tampa Bay estuary. Grass flats, white sand flats, mangrove shoreline, oyster bars and creek and river mouths make this some of the best salt water fishing in Florida. Speckled trout, red fish, snook, cobia, tarpon, jacks, mackerel and ladyfish provide lots of action.

GOLF

Tampa Bay has many beautiful golf courses designed for not only scenic beauty but golfing challenges as well. If you couldn't make the golf outing offered as a Social Tour, visit the Hospitality Suite to help you arrange an enjoyable day on the greens.

"KID" FUN

GameWorks

Under the direction of Steven Spielberg, GameWorks, located in the heart of Ybor City, was created as the quintessential entertainment destination. Designed as an engaging game factory for people of all ages, experience the blistering pace and heart-racing action of the most state-of-the-art games. Go to www.gameworks.com.

Celebration Station

The place to go for family, food and fun! Enjoy Go Karts with or without a passenger, bumper boats, miniature golf and a game room. Take a break and enjoy a slice of pizza and a soft drink.

Malibu Grand Prix

Kids fun in the sun at the races! Challenge the twirling windmill on the miniature golf course. Put the pedal to the metal and test the curves on the Go Kart track. Visit the game room and have some refreshments.

LIFE IS A BEACH

Visit the Hospitality Suite for guides to local Gulf of Mexico Beaches, rated among the best in the world! Scuba diving or snorkeling trips in the Gulf of Mexico are available. Summer water temperatures are as high as 85 degrees with average visibility around 25 feet.

SAILING

Relax on one of the local sailing yachts or catamarans along the coast. Enjoy sunbathing on a lovely sailing vessel. Bring along sunscreen, a towel and a camera to capture dolphins or birds that may be in the area.

STILL NOT ENOUGH SHOPPING?

Spend some time at Sarasota's St. Armand's Circle featuring fine shops and gourmet restaurants in a tropical contemporary design. Citrus Park Town Center is the newest jewel for mall shopping in northwestern Tampa. Designed as a Main Street USA, all the shops are creatively constructed with facades as individual stores complete with awnings and 2nd story window treatments.

TARPON SPRINGS, "UNIQUELY GREEK"

Visit this quaint Greek community, alive with sponge docks, St. Nicholas Church with its weeping Icon, the Shrine of St. Michael's, the George Innes paintings and more. Board a small sponge boat for a sponge diving exhibition.

LAST BUT NOT LEAST

The Channelside Center is just a five-minute walk from the Marriott and includes a variety of retail stores, coffee shops, a cinema with twelve theaters, an IMAX theater, a variety of bars and restaurants, a WWII Liberty Ship that can be toured, and the Aquarium. Channelside is also the Cruise Ship terminal for Carnival Cruise Lines in case you would like to incorporate a relaxing cruise following a week of busy meeting activities. The elegant Starship dining yacht is also based here, providing fine dining during evening cruises on Tampa Bay.

TRAVEL ARRANGEMENTS

CAR RENTAL INFORMATION

Hertz is providing meeting attendees with the following discounted group rates, available from June 9-27, 2002.

	<i>Per day</i>	<i>Per week</i>
Economy	\$32.99	\$112.99
Compact	\$33.99	\$121.99
Midsize	\$35.99	\$157.99
Full size (4dr)	\$41.99	\$194.99
Minivan	\$51.99	\$251.99
4 Wheel Drive	\$51.99	\$251.99
Convertible	\$57.99	\$289.99

To book a car call **Hertz** at 1-800-654-2240; in Canada 800-263-0600. Request **Meeting CV#02460013** for special rates.

AIRLINE INFORMATION

Special rates have been arranged for the HPS meeting with USAirways. USAirways is offering (only valid through phone reservations) a 10% discount off the unrestricted applicable "Y" published fares or B8US/B4AUS fares when purchased 7 days in advance of travel or 15% discount off the unrestricted applicable "Y" published fares or B8US/B4AUS fares when purchased 60 days in advance of travel. A 5% discount off lowest applicable fares for First/Envoy Class and 10% off when tickets are purchased at least 60 days in advance of travel, to all attendees, **available from June 6-23**. This special offer applies to travel on domestic segments of all US Airways, US Airways Shuttle and MetroJet flights. USAirways' convenient schedule and discounted fares are available through USAirways Group and Meeting Reservation Office.

To reserve your flight call **USAirways at 1-877-874-7687**. Request **Gold File Number 68672182** for the special discount. Dedicated reservationists are on duty seven days a week from 8:00 am to 9:30 pm Eastern time.

CURRENT EVENTS/WORKS-IN-PROGRESS

The submission form for the Current Events/Works-in-Progress poster session is on the Health Physics Society web site, www.hps.org under the Conferences section. The deadline for submissions is **Friday, May 3, 2002**. All presentations will take place as posters on Monday, June 17 between 1:30-3 pm. Individuals will be notified of acceptance of their WIP submissions in late May.

For questions regarding WIP submissions, contact Sue Burk or Lori Strong at the HPS Secretariat at 703-790-1745 or sburk@burkinc.com/lstrong@burkinc.com.

BE A MENTOR

The HPS will be trying a new program at the annual meeting, A Mentoring Program. This program is designed to help students and first time attendees (FTA) feel more a part of the HPS family. This program will pair students and FTA with members who have been around the HPS block, so information can be passed on to the new generation. The mentor will be able to show the mentee around the meeting, share the advantages of joining HPS, introduce them to other members, and share how HPS works and what we are all about. This does not mean the member has to spend all of their time with the mentee, but if there are meetings you think that would interest them, invite the mentee to the meeting so they will see how HPS works from the inside. This is designed for the mentor to be a meeting liaison for the student and FTA in order for them to feel welcomed into the HPS arena, rather than wondering about not knowing anyone. Please watch for an article in the Newsletter about the Mentoring Program and sign up to be a mentor (or request a mentor) on your registration form.

American Radiation Safety Conference and Exposition
Tampa, Florida - June 16-20, 2002 - Preliminary Scientific Program

MONDAY

7:15-8:15 AM Room: **CC 18/19**
CEL-1 Backgrounds, Detection Limits, and Treatment of Uncertainties in Survey Data. *J. Shonka; Shonka Research Associates, Inc.*

7:15-8:15 AM Room: **CC 20/21**
CEL-2 The Oklo Natural Nuclear Reactor. *A. Karam; University of Rochester*

8:30 am - Noon Room: **CC Ballroom A/B**

MAM-A: Plenary Session
Trends in Medical Doses, Technology, and Population Risks

Chair: George Anastas

8:30 AM
Welcome and Introduction of Landauer and Morgan Lecturers. *Local Committee, G. Anastas, W. Mills*

8:45 AM MAM-A.1
Radiation Risks, a Review of What We Know from Medical Radiation Studies. *J.D. Boice, Jr.; International Epidemiology Institute (Robert S. Landauer, Sr. Lecture)*

9:30 AM MAM-A.2
The Challenge of Radiation Exposure from CT: An Editor's Perspective. *L. Rogers; American Journal of Roentgenology (G. William Morgan Lecture)*

10:15 AM BREAK

10:45 AM MAM-A.3
The Risks of Radiation Exposure During Pregnancy: Controversies Resolved and Yet to be Resolved. *R.L. Brent; Jefferson Medical College, duPont Hospital for Children*

11:30 AM DISCUSSION
George Anastas

Noon-1:30 pm Exhibit Hall B

Lunch in Exhibit Hall for all Registrants and Opening of Exhibits

12:15-2:15 pm PEP Program

1:30 - 3:00 pm Room: **CC Exhibit Hall**

P: Poster Session

ACCELERATOR

P.1 Development of Dose Coefficients for Radionuclides Produced in Spallation Neutron Sources. *J. Shanahan, Y. Song, P. Patton, M. Rudin; University of Nevada - Las Vegas*

P.2 Health Physics Aspects of the DARHT Facility Beamstop and Shielding Wall. *A. Cucchiara, J. Hoffman, M. Bayless; Los Alamos National Lab*

P.3 Radiation Research Opportunities at the Idaho Accelerator Center. *D.P. Wells, J.F. Harmon, R. Brey; Idaho State University*

P.4 Small, Portable Linear Accelerators as a Waste Management Tool. *J. Kwofie, D. Wells, F. Selim, F. Harmon, J. Jones, S.P. Dutttagupta; Idaho State University, Boise State University*

P.5 Study of the I-129 (gamma,n) I-128 Photonuclear Reaction. *G. Kharashvili, R. Brey, D. Wells; Idaho State University*

P.6 A Fricke Dosimetric Technique to Calculate G-Values for Accelerator Produced Photons with Energies between 1-30 MeV. *J. Macklin, R. Brey; Idaho State University*

P.7 Shielding Analysis at Two Radiation Oncology Sites. *N. Gee, R. Brey, M. Davidson; Idaho State University*

BIOKINETICS/BIOEFFECTS

P.8 Effects of Low Fluence Rate PDT on Human Gliomas. *R. Rodenbush, S. Madsen; University of Nevada - Las Vegas*

NOTE: If a paper is going to be presented by other than the first author, the presenter's name is underlined.

MONDAY

EMERGENCY RESPONSE/PLANNING

P.9 First Responders Need to Know. *T. O'Connell, P. Ares; MA DPH Radiation Control Program, MA Emergency Management Agency*

P.10 Overview of Data Simulator for Radionuclide Releases. *E. Wagner, C. Riland; Bechtel Nevada*

P.11 Potassium Iodide and the National Pharmaceutical Stockpile Program. *R. Whitcomb, Jr.; Centers for Disease Control and Prevention*

ENVIRONMENTAL/DECOMMISSIONING

P.12 Technical Basis for Calculating Radiation Doses for the Building Occupancy Scenario using the Probabilistic RESRAD-BUILD 3.0 Code. *S. Kamboj, B.M. Biwer, C. Yu, S.Y. Chen, T. Mo.; Argonne National Laboratory, US Nuclear Regulatory Commission, Washington, D.C.*

P.13 NRC License Termination Planning at the Former Army Depot that Stored Depleted Uranium Munitions and Other Licensed Commodities. *K. Picel, S. Kamboj, T. Sydelko, J. Cleary, T. Enroth; Argonne National Laboratory, Seneca Army Depot*

P.14 The Practices on Automatic Drain Water Radioactivity Monitoring in the Institute of Nuclear Energy Research. *S.-F. Fang; Institute of Nuclear Energy Research, Taiwan*

P.15 Effects of the Cerro Grande Fire (Smoke and Fallout Ash) on Possible Contaminants in Soils and Crops Downwind of Los Alamos National Laboratory. *P.R. Fresquez, W.R. Velasquez, L. Naranjo; Los Alamos National Laboratory*

P.16 A Simple Non-Destructive Method to Determine Depths of Radiological Contamination. *A.R. Al-Ghamdi, X.G. Xu; Rensselaer Polytechnic Institute*

P.17 Comparison of Thyroid Dose Estimates to Native Americans from Hanford Releases to the Air using Reference versus Tribal-Specific Diets. *E.H. Donnelly, E.B. Farfán, C.W. Miller, W.E. Bolch; Centers for Disease Control and Prevention, Atlanta, University of Florida – Gainesville*

P.18 A Field Test of Electret Ion Chambers for Environmental Monitoring for Environmental Remediation Verification. *L. Paulus, D. Walker, K. Thompson; State of Idaho INEEL Oversight Program, BBWI*

EXTERNAL DOSIMETRY

P.19 Modification of MIRD Human Phantom Based on the Comparison of the Dose Calculation with the Realistic Voxel Phantom. *C. Lee, C. Lee, J. Lee; Hanyang University - Seoul, Korea, University of Florida - Gainesville*

P.20 Construction of Korean Reference Adult Male and Female Voxel Phantoms. *C. Lee, C. Lee, J. Lee; Hanyang University - Seoul, Korea, University of Florida - Gainesville*

P.21 Development of Voxelized Fetal Models for Monte Carlo Dosimetry using 3D Ultrasound Imaging. *C. Shi, T. Zhang, T.-C. Chao, X.G. Xu; Rensselaer Polytechnic Institute*

P.22 Validation of EDCal 2.0 - a user-Friendly Computer Program to Calculate Radiation Doses to Various Organs, Tissues, and Personal Dosimeters. *C.-H. Kim, B. Wang; Rensselaer Polytechnic Institute*

P.23 Neutron Dose Comparison: CR-39 VS TLD. *S. Sengupta, G. Holeman, H. Kahnhauser; Brookhaven National Laboratory, Holeman Consultants, Inc.*

P.24 International Intercomparisons of Beta Particle Dosimetry. *C. Soares, J. Böhm, K. Helmstädter; National Institute of Standards and Technology, Physikalisch Technische Bundesanstalt, Germany*

P.25 Characterization of the Neutron Field in the Irradiation Cell of the Texas A&M University Research Reactor for Boron Neutron Capture Therapy (BNCT). *S.Y. Jang, C.-H. Kim, W.D. Reece; Texas A&M University, Rensselaer Polytechnic Institute*

INSTRUMENTATION

P.26 Rapid Analytical Technique to Identify Alpha Emitting Isotopes in Water, Air-Filters, Urine and Solid Matrices using a Frisch Grid Detector. *S. Scarpitta, N. Carte, R. Miltenberger, R. Gaschott; Brookhaven National Lab, University of Connecticut*

P.27 *in situ* Tritium Probe for Effluent and Ground Water Monitoring. *J. Stutz, C. Hull; University of Nevada - Las Vegas*

P.28 Low Energy Photon Measurement using Plastic Scintillation. *J. Ellis; Westinghouse Savannah River Company*

P.29 Calculation of the Total-to-Peak Ratio of a Low-Energy HPGE Gamma-Ray Detector. *M. Abbas, M. Bassiouni; Alexandria University, Egypt, Arab Academy for Science and Technology, Alexandria, Egypt*

P.30 Using Static Efficiency Measurements for Determination of Instrument Scan Efficiency Calibration Factors for Point and Small Area Sources. *W. Duffy, K. Hart, K. Higley; Puget Sound Naval Shipyard, Oregon State University*

P.31 Comparison of Desiccant Materials used for Monitoring Atmospheric Tritium Concentrations in a High Tritium Background Environment. *J. Case, R. Dunker, L. Paulus, R. Brey; Idaho State University*

MONDAY

P.32 Examination of HPGE Efficiency for Varying Amounts of Similar Density Material. *A. Arndt, R. Brey; Idaho State University*

P.33 Using Gamma Imaging and *in situ* Gamma Spectroscopy in Nuclear Facilities. *F. Bronson; Canberra*

INTERNAL DOSIMETRY

P.34 Uncertainties in Electron Absorbed Fractions within the ICRP-66 Respiratory Tract Model. *E.B. Farfán, T.E. Huston, W.E. Bolch, E.Y. Han, W.E. Bolch, C.H. Huh; University of Florida, University of Arkansas for Medical Sciences*

P.35 Beta-Particle Dosimetry within the ICRP-66 Respiratory Tract Model: Impact of Uncertainties in Electron Absorbed Fractions on Lung Dose Estimates. *E.B. Farfán, T.E. Huston, W.E. Bolch, E.Y. Han, D.A. Rajon, K.P. Kim; University of Florida, University of Arkansas for Medical Sciences*

P.36 A Revised Dosimetric Model of the Extrathoracic and Thoracic Airways. *E.Y. Han, E.B. Farfán, W.E. Bolch, T.E. Huston, W.E. Bolch; University of Florida, University of Arkansas for Medical Sciences*

P.37 Individual Variations in Mucosa and Total Wall Thickness within the Stomach and Rectum Assessed via Endoscopic Ultrasound. *C. Huh, M.S. Bhutani, W.E. Bolch, E.B. Farfán, W.E. Bolch; University of Florida*

P.38 Chord Length Distribution Measurements through Polygonal Representations of Trabecular Bone Samples. *D. Rajon, A. Shah, C. Watchman, J. Brindle, W. Bolch; University of Florida*

P.39 Coping with Some of ICRP-based Internal Dose Computing Difficulties. *O. Bondarenko, D. Melnichuk; Radiation Protection Institute, Ukraine*

P.40 Calculation of Internal Dose Conversion Factors for Selected Spallation Products. *H.O. Wooten, N.E. Hertel; Georgia Institute of Technology*

P.41 Statistical Analysis of Dose Assignments Resulting from Plutonium Bioassay. *M.P. Krahenbuhl, D.M. Slaughter; University of Utah*

P.42 Dose Evaluation of Metal Tritide Particles using the ICRP 66 and Biokinetic Models. *Y. Zhou, Y.-S. Cheng; Lovelace Respiratory Research Institute*

P.43 Investigation of Medical-Prophylactic Procedures to Reduce Radiation Doses from Internally Incorporated Plutonium. *E. Lyubchansky, A. Sokhranich; Deputy Director on Science, Senior Researcher, Russia*

P.44 Charged Particle Equilibrium Corrections for Photon Point Sources: EGS4-DOSRZ Monte Carlo Calculations. *L. Vasudevan, J. Poston, Sr., W. Reece; Texas A&M University*

MEDICAL HEALTH PHYSICS

P.45 The History and Development of the MOSFET Dosimeter. *A. Jones, D. Hintenlang; University of Florida*

P.46 A Comparison of Radiation Dose and Quantitative Measures of Image Quality in Pediatric Diagnostic X-Ray. *D. Hintenlang, C. Pitcher; University of Florida*

P.47 A Method for Determination of Organ Doses for Pediatric Fluoroscopy Studies. *F. Pazik, J. Sessions, M. Arreola, J. Williams, W.E. Bolch; University of Florida*

P.48 Induced Radioactive Potential for a Medical Accelerator. *V. Evdokimoff, J. Willins, H. Richter; Boston University Medical Center*

P.49 Selection of Radioactive Seeds for Intravascular Brachytherapy: Clinical and Safety Issues. *M. Winslow; Rensselaer Polytechnic Institute*

P.50 The Treatment of Unresectable Hepatic Malignancies using Y-90 Glass Microspheres: A Team Approach. *V. Gates, C. Schultz, R. Salem, H. Dworkin; William Beaumont Hospital*

P.51 Experience in Teaching Monte Carlo Method to Undergraduate NE/HP Students at Rensselaer. *B. Wang, A. Al-Ghamdi, X.G. Xu; Rensselaer Polytechnic Institute*

OPERATIONAL HEALTH PHYSICS

P.52 Improving Work Authorizations Required for Radiological Work. *S. Green, R. Bauman; Bechtel Jacobs Company, LLC*

P.53 Occupational Radiation Exposures at DOE Office of Science Laboratories. *B. Parks; US Department of Energy*

P.54 Efficiency of Street Cleaner in Removing Depleted Uranium from Asphalt Roads and Parking Lots. *N. Anderson, M. Bayless, A. Cucchiara, W. Griego; Los Alamos National Laboratory*

P.55 Using an Institution's Financial Software to Manage its Radioisotope Inventory. *S. Dupre; Princeton University*

P.56 Security of Radioactive Material at Academic Institutions. *M. Martz, D. Farley, S. Langhorst, R. Normandin; Medical College of Wisconsin, University of California - Riverside, Washington University at St. Louis*

MONDAY

RADIONUCLIDE NESHAPS

P.57 Database Applications in Clean Air Act Compliance. *S. Terp, D. Fuehne, E. Jones, R. Sturgeon; Los Alamos National Laboratory*

RADON

P.58 Elevated ^{222}Rn Concentration in some Wells in Hail Region of Saudi Arabia. *A. El Megid Mamoon, W.A. El Farag, M. Sohsah; King Abdulaziz University*

P.59 Measurement of Radon Emanation from Building Materials using E-PERM Integrating Radon Monitors. *P. Kotrappa, L. Stieff; Rad Elec Inc.*

P.60 Radon and Thoron Measurements around the Radium Silos at Fernald, OH, New York City and New Jersey. *P. Chittaporn, N.H. Harley, R. Medora, R. Merrill; New York University School of Medicine, Nelson Institute of Environmental Medicine, Fluor Fernald Radiation Control Section*

P.61 Quality Control for Particle Size Measurements at Fernald. *N.H. Harley, P. Chittaporn, M. Heikkinen, R. Medora, R. Merrill; New York University School of Medicine, Fluor Fernald Radiation Control Section, Canada*

REGULATORY/LEGAL ISSUES

P.62 What Could that Inspector be Thinking? *S. Fitch; New Mexico Radiation Control Bureau*

P.63 Exit Doors Radiation Monitors: Is it an Invasion of Privacy? *G. Hamawy; Columbia University*

RISK ANALYSIS

P.64 Oak Ridge Dose Reconstruction Project. *J. Buddenbaum, T. Widner; ENSR International Corporation*

P.65 Radiation Quality of Heavy Ions with the Same Stopping Power. *J. Chen; Radiation Protection Bureau, Health Canada*

RSO SECTION

P.66 Developing a Radioactive Waste Program for New RSOs. *S. Austin; CI-Radiation Safety Academy*

WASTE MANAGEMENT

P.67 Sorption/Desorption Kinetics of Cesium in Type V Portland Cements. *R. Turner, M. Rudin, W. Johnson, S. Steinberg, V. Hodge; University of Nevada - Las Vegas*

P.68 Development and Evaluation of a Neutron-Photon Shield for Transuranic (TRU) Waste Drums. *J. Castro, C. Montague, D. Wannigman, R. Wishau; Los Alamos National Laboratory*

3:00 - 5:00 pm

Room: CC Ballroom A/B

MPM-A: Medical HP and RSO Section Joint Session: Doses from Medical Procedures-Special Concerns for Women and Children

Co-Chairs: Carmine Plott and Bob Wilson

3:00 PM **MPM-A.1**
Doses from Medical Procedures-Special Considerations for Women and Children: Pregnant Women and Women of Reproductive Age. *R.L. Brent; Jefferson Medical College (G. William Morgan Lecture)*

3:30 PM **MPM-A.2**
AAPM/HPS Draft Standard on Fetal Dose Assessment: Fetal Dose from Nuclear Medicine Procedures. *M. Stabin; Vanderbilt University*

3:45 PM **MPM-A.3**
AAPM/HPS Draft Standard on Fetal Dose Assessment: Fetal Dose from Radiotherapy. *R. Blackwell, M. Stovall; Mayo Clinic/Foundation, UT MD Anderson Cancer Center*

4:00 PM **MPM-A.4**
AAPM/HPS Draft Standard on Fetal Dose Assessment: Fetal Dose from Diagnostic X-Ray Procedures. *E. Donnelly, M. Stabin, L. Williams; Vanderbilt University Medical Center, City of Hope Medical Center*

4:15 PM **MPM-A.5**
AAPM/HPS Draft Standard on Fetal Dose Assessment: Fetal Dose from Occupational Exposures. *V. King; Bechtel BWXT Idaho*

4:30 PM **MPM-A.6**
Radiation Dose and Benefits vs. Risk in Mammography. *L.N. Rothenberg; Memorial Sloan-Kettering Cancer Center*

3:00 - 4:30 pm

Room: CC 20/21

MPM-B: External Dosimetry

Co-Chairs: Jeffrey Hoffman and Bruce Rathbone

3:00 PM **MPM-B.1**
Direct Ion Storage Detectors: Legal Approval of the Personal Dosimetry System DIS-1 and Recent Development on DIS-N Systems. *C. Wernli, A. Fiechtner, M. Boschung; P. Scherrer Institute, Switzerland*

3:15 PM **MPM-B.2**
Development of the Differential Angle Laser Illuminated Track Etch Scattering (DALITES) System for Reading Neutron-Induced Tracks in CR-39. *H.J. Gepford, M.E. Moore, N.E. Hertel; University of Missouri - Rolla, Los Alamos National Laboratory, Georgia Institute of Technology*

MONDAY

3:30 PM **MPM-B.3**
Development of a Temperature Stabilized Light Source for TLD Readers. *M. Nelson, G. Messner, B. Jenkins, J. Cassata; US Naval Academy, Naval Dosimetry Center*

3:45 PM **MPM-B.4**
A Proposal for Virtual Reality Dose Simulation using Image-Based Deformable Anatomical Modeling and Dynamic Monte Carlo Method. *X.G. XU; Rensselaer Polytechnic Institute*

4:00 PM **MPM-B.5**
A Comparison of Dose Exposure of a Stationary Phantom and a Rotating Phantom. *J.P. Johnson, D.W. Gray, J.M Hoffman, M.W. Mallett, L.L. Romero, R.J. Wishau; Los Alamos National Laboratory*

4:15 PM **MPM-B.6**
Interplanetary Crew Doses from Large Solar Particle Events: Variations among Different Skin Sites. *J. Hoff, L. Townsend, N. Zapp; University of Tennessee, Lockheed Martin Space Operations*

3:00 - 4:30 pm **Room: CC 22/23**

MPM-C: Operational Health Physics

Co-Chairs: David Hwang and Paul Pater

3:00 PM **MPM-C.1**
The Quest for Sustaining Radiation Safety Personnel for Mission-Critical Positions. *M.B. Lee; Los Alamos National Laboratory*

3:15 PM **MPM-C.2**
Assuring Sufficient Future Availability of Health Physicists in the U.S. *R. Andersen, S. Simmons, D. Modeen; Nuclear Energy Institute*

3:30 PM **MPM-C.3**
Radioactive Source Control and Accountability in a Global Environment. *D. Brown, S. Woods; Halliburton Energy Services, Inc.*

3:45 PM **MPM-C.4**
A Novel Radiation Source Security Screening Tool. *M. Charlton, C. Shriver, R. Emery; UT Health Science Center at San Antonio*

4:00 PM **MPM-C.5**
Uncertainty Analysis for Detection Limit Definition and Confidence Interval Estimation. *W. Potter, A. Brodsky; Sacramento, CA, Science Applications International Corporation*

4:15 PM **MPM-C.6**
ALARA Matrix Implementation using the Radiation Protection Automation System. *W.J. Wenzel, B. Campbell, J.L. Bliss, J.E. Salazar, M. Bayless; Los Alamos National Laboratory*

3:00 - 5:30 pm **Room: CC 24/25**

MPM-D: Radiological Security/Emergency Planning/Response

Co-Chairs: Paul Charp and Greg Komp

3:00 PM **MPM-D.1**
Proactive Radioactive Materials Management in Light of 9/11. *M. Pearson; Self-Employed*

3:15 PM **MPM-D.2**
Summary of Actions Taken by the Nuclear Regulatory Commission Following the Events of September 11, 2001. *J. Holonich, R. Wessman; US Nuclear Regulatory Commission*

3:30 PM **MPM-D.3**
International Approaches to Prevention of and Response to Radiological Terrorism. *G. Webb; IRPA*

3:45 PM **MPM-D.4**
Use of ACRID/ERAD Assessment Tools for Homeland Defense. *W. Rhodes, M. Larsen, F. Harper, W. Wente; Sandia National Labs*

4:00 PM **MPM-D.5**
The Nation's Orphan Nuclear Stockpile. *J.A. Tompkins, L.E. Leonard; Los Alamos National Laboratory*

4:15 PM **MPM-D.6**
Orphan Source Perspectives in the Aftermath of 11 September 2001. *J. Lubenau, B. Dodd; International Atomic Energy Agency*

4:30 PM **MPM-D.7**
Common Problem Areas During Emergency Response Events and Exercises. *C. Riland, E. Wagner; Bechtel Nevada*

4:45 PM **MPM-D.8**
Who You Gonna Call? *S.E. Reed, K. Austin, C. Ribaldo, R. Zoon; National Institutes of Health*

5:00 PM **MPM-D.9**
WHO's New Program on Radiation and Health. *M. Repacholi, L. Kheifets; World Health Organization, Switzerland*

5:15 PM **MPM-D.10**
The North American Technical Center's Role in National Radiological Emergency Preparedness. *J. Harris, D. Miller; University of Illinois/NATC*

MONDAY

3:00 - 4:45 pm

Room: CC 18/19

MPM-E: Biokinetics/Bioeffects

Co-Chairs: Matt McFee and Elyse Thomas

3:00 PM

MPM-E.1

Health Physics Implications of Studies of Brief Irradiation of Reproductive Cells. *O.G. Raabe, J.E. Baulch; University of California - Davis*

3:15 PM

MPM-E.2

Evaluation of Novel Photosensitizers in Laser Treatments of Brain Cancer. *S.A. Friesen, G.O. Hjortland, H. Hirschberg, O. Engebraaten, Q. Peng, S.J. Madsen; University of Nevada - Las Vegas, The Norwegian Radium Hospital, Norway, The National Hospital, Norway*

3:30 PM

MPM-E.3

WHO's Recommendations on Health Effects from EMF Exposure. *M. Repacholi, L. Kheifets; World Health Organization, Switzerland*

3:45 PM

MPM-E.4

Comprehensive Review and Revision of Thyroid Bioassay Procedures in Radionuclide Therapy using Iodine-131. *T.T. Yoshizumi, R.E. Reiman, M.R. Sarder, R.E. Coleman, N.A. Petry, F.R. Schuler; Duke University Medical Center*

4:00 PM

MPM-E.5

Age-Specific Uncertainty of the I-131 Ingestion Dose Conversion Factor. *R. Harvey, D. Hamby; University of Buffalo, Oregon State University*

4:15 PM

MPM-E.6

Theoretical Organically Bound Tritium Dose Estimates. *T.A. DeVol, B.A. Powell; Clemson University*

4:30 PM

MPM-E.7

Probability of Causation for Radiation-Induced Cancer from Internally-Deposited Radionuclides. *O. Raabe; University of California - Davis*

ADJUNCT TECHNICAL MEETING

6:00 - 8:00 pm

Marriott Hotel

Current Issues in Health Physics Instrumentation

(all presentations are 15 minutes)

Chair: Morgan Cox

Gamma Insensitive Real-Time Fast Neutron Personnel Dosimeter. *S. Kronenberg (deceased), G.J. Brucker; US Army, Fort Monmouth, NJ*

Future Directions for Portable Radiation Detection Instruments. *J.T. Voss, Los Alamos National Laboratory*

EPA/USCS Pilot Testing of the RAD-COMM Grappler-Mounted Radiation Detector. *P. Chiaro; Oak Ridge National Laboratory*

Field Experience with the PRESCILA. *J.T. Voss; Los Alamos National Laboratory*

Conveyor-Driven Contamination Monitors. *M. Cox, M. Overhoff; Consultant, Santa Fe, NM, Overhoff Technology Corporation*

A Personnel Alpha Continuous Air Monitor (CAM). *J.T. Voss; Los Alamos National Laboratory*

A New Tritium Calibration Facility in the UK. *M. Pottinger, R. Otlet, J. Caunt; BNFL-Berkeley Laboratory, UK, RCD Ltd, UK, John Caunt Scientific, UK*

TUESDAY

7:15-8:15 AM Room: **CC 18/19**
CEL-3 Radiation Protection Quantities: A Critique.
J.R. Cameron; University of Wisconsin

7:15-8:15 AM Room: **CC 20/21**
CEL-4 Radiation Accident History. *R. Toohey; Oak Ridge Associated Universities*

8:30 am - Noon Room: **CC 18/19**

TAM-A: AAHP Special Session: Accidents in the Nuclear Industry; Impacts and Lessons Learned

Chair: Lee Booth

8:30 AM Introduction
R.C. Ricks; Oak Ridge Associated Universities

9:00 AM TAM-A.1
Radiation Accidents Involving "Orphan Sources." *J.G. Yusko; Pennsylvania Department of Environmental Protection*

9:30 AM TAM-A.2
Criticality Accidents in Process Facilities-Lessons Learned. *T. McLaughlin; Los Alamos National Laboratory*

10:00 AM TAM-A.3
Nuclear Weapon Accidents. *J. Taschner; Los Alamos National Laboratory*

10:30 AM BREAK

11:00 AM TAM-A.4
The Army Stationary Low-Power Reactor (SL-1) Accident. *T. Gesell; Idaho State University*

11:15 AM TAM-A.5
The Pittsburgh Accelerator Accident: Events and Lessons Learned. *N. Wald, J. Lubenau; University of Pittsburgh, Self-Employed*

11:30 AM TAM-A.6
The Accident at Three Mile Island. *R. Dubiel; Self-Employed*

Noon AAHP AWARDS LUNCHEON

8:30 am - Noon

Room: **CC 20/21**

TAM-B: Depleted Uranium Aerosol Characterization: Applicability to Soldier Exposure Assessment

Co-Chairs: Mary Ann Parkhurst and Raymond Guilmette

8:30 AM TAM-B.1
Historical and Political Background for the Depleted Uranium Capstone Test - How the Bar was Raised. *E. Daxon, M. Melanson, D. Alberth; US Army*

8:45 AM TAM-B.2
The Capstone Depleted Uranium Aerosol Test: Background and Experimental Design Overview. *M.A. Parkhurst; Pacific Northwest National Laboratory*

9:00 AM TAM-B.3
Aerosol Instrumentation and Sampling System for the Capstone Test Series. *T.D. Holmes, R.A. Guilmette, Y.-S. Cheng, M.D. Hoover; Lovelace Respiratory Research Institute, Los Alamos National Laboratory, NIOSH*

9:15 AM TAM-B.4
Depleted Uranium Test Facility and Sample Recovery. *J. Beckman, J. Long, F. Szrom, J. Collins; US Army Aberdeen Test Center, US Army Center for Health Promotion and Preventive Medicine*

9:30 AM TAM-B.5
Surface Contamination and Deposition of Depleted Uranium Following Armored Vehicle Impact. *F. Szrom, J. Collins, R. Fliszar, G. Lodde; US Army Center for Health Promotion and Preventive Medicine, US Army Armament Research*

9:45 AM TAM-B.6
Characterization of Depleted Uranium Aerosols Formed Exterior to an Armored Vehicle Following Penetrator Impact. *R. Fliszar, K. Gold, F. Szrom, J. Collins, R. Guilmette; US Army Armament Research, U.S. Army Center for Health Promotion and Preventive Medicine, Los Alamos National Laboratory*

10:00 AM BREAK

10:30 AM TAM-B.7
Disequilibria of Depleted Uranium Progeny following Armored Vehicle Impact. *F. Szrom, J. Collins, G. Lodde, D. Alberth; US Army Center for Health Promotion and Preventive Medicine*

10:45 AM TAM-B.8
DU Activity Concentrations as a Function of Time during the Capstone Aerosol Test. *J. Kenoyer, Y.S. Cheng, M.A. Parkhurst; Dade Moeller & Associates, Inc., Lovelace Respiratory Research Institute, Pacific Northwest National Laboratory*

TUESDAY

11:00 AM **TAM-B.9**
Particle Size Distribution of Aerosols Generated Inside Vehicles. *Y.S. Cheng, J. Kenoyer, J. Glissmeyer; Lovelace Respiratory Research Institute, Dade Moeller & Associates, Battelle (PNNL)*

11:15 AM **TAM-B.10**
Characterization of Depleted Uranium Oxides and Particle Morphology from the Capstone Aerosol Test. *M.A. Parkhurst, K. Gold, B. Arey, E. Jenson; Pacific Northwest National Laboratory, US Army, ARDEC*

11:30 AM **TAM-B.11**
Measurement of the *in vitro* Solubility of Depleted Uranium (DU) in Aerosols Produced by Impact of DU Penetrators on Armored Vehicles. *R. Guilmette, Y.S. Cheng, T. Krenik; Los Alamos National Laboratory, Lovelace Respiratory Research Institute*

11:45 AM **TAM-B.12**
Applicability of Capstone Aerosol Characterization Data to Soldier Exposure Assessment. *R. Guilmette, M.A. Parkhurst; Los Alamos National Laboratory, Pacific Northwest National Laboratory*

8:30 am - Noon **Room: CC 22/23**

TAM-C: Accelerator Section Session

Chair: Carter Ficklen

8:30 AM **TAM-C.1**
Laser Wakefield Accelerator, LBNL Experience. *K. Barat, W. Leemans; Lawrence Berkeley National Laboratory*

9:00 AM **TAM-C.2**
Evaluation of the Microdosimetric-Based Neutron Instrument REM500 in Accelerator Neutron Fields at SLAC. *J. Liu, S. Rokni; Stanford Linear Accelerator Center*

9:15 AM **TAM-C.3**
The NIM Platform at CAMD - Beam-Loss Radiation Calculations. *J.D. Scott, M.-L. Marceau-Day; LSU-CAMD*

9:30 AM **TAM-C.4**
High Energy Neutron Measurements at the Weapons Neutron Research Facility at LANSCE. *M. Duran; LANSCE Accelerator Health Physics*

9:45 AM **TAM-C.5**
Radiation Safety Impact of DFELL Upgrade. *V. Vylet; Duke University*

10:00 AM **TAM-C.6**
Induced Radioactivity of Materials by Stray Radiation Fields at an Electron Accelerator. *S. Rokni, A. Fasso, T. Wise, J. Liu, S. Roesler; Stanford Linear Accelerator Center, CERN*

10:15 AM **BREAK**

10:45 AM **TAM-C.7**
Manual Lujan Neutron Scattering Center Radioactive Liquid Waste (RLW) System Blow out and Ensuing Cleanup. *L.S. Walker, J. Bliss, W. Haynes; Los Alamos National Laboratory*

11:15 AM **TAM-C.8**
MARSSIM Application to the Decommissioning of a Synchrotron Light Source Facility. *R. May; Thomas Jefferson National Accelerator Facility*

11:30 AM **TAM-C.9**
Benchmark Studies on the Attenuation and Streaming of D-T Neutrons and Secondary Radiation at the Most Intense 14-MeV Neutron Source Facility. *M.S. Singh, M.T. Tobin, S.J. Brereton, J.F. Latkowski, K.L. Shingleton, J. Yatabe; Lawrence Livermore National Laboratory*

11:45 AM **TAM-C.10**
A Computer Based Program for Accelerator Radiation Safety Training. *S. Butala, J. Corsolini; Argonne National Laboratory*

Noon **Accelerator Section Meeting**

8:30 - 10:00 am **Room: CC 24/25**

TAM-D: Medical HP Section Session: 21st Century - The Century of Medical Science

Chair: Jean St. Germain

8:30 AM **TAM-D.1**
The Future of Radiation as a Modality in the Era of the Genome. *W. McBride; University of California – Los Angeles*

9:15 AM **TAM-D.3**
Ethical Issues in Radiation Research. *J. Kahn; University of Minnesota*

10:00 AM **BREAK**

10:30 AM **Medical HP Section Meeting**

12:15-2:15 pm **PEP Program**

2:30 - 5:00 pm **Room: CC 18/19**

TPM-A: AAHP Special Session: Accidents in the Nuclear Industry; Impacts of Lessons Learned

Chair: Lee Booth

2:30 PM **TPM-A.1**
Major Radionuclide Releases to the Environment from the Russian Mayak Production Association. *B. Napier; Pacific Northwest National Laboratory*

TUESDAY

2:45 PM **TPM-A.2**
Internal Contamination in the Goiania Accident. *J.L. Lipsztein, D.R. Melo, C.A.N. Oliveira, A. Ramalho; Instituto de Radioprotecao e Dosimetria, Brazil*

3:00 PM **TPM-A.3**
Health Physics Lessons Learned from the Chernobyl Accident. *G.J. Vargo; Pacific Northwest National Laboratory*

3:30 PM **BREAK**

4:00 PM **TPM-A.4**
Sequoyah Fuels Facility UF₆ Accident. *E. Still; Retired*

4:15 PM **TPM-A.5**
The Criticality Accident at Tokai-Mura, Japan. *R. Toohey; Oak Ridge Institute for Science and Education*

4:45 PM **TPM-A.6**
Generalizing Lessons Learned from Accidents; Predicting Consequences Per Unit Source Term. *D.J. Strom, C.R. Watson, P.S. Stansbury; Pacific Northwest National Lab*

5:00 PM **AAHP Open Meeting**

2:15 - 5:45 pm **Room: CC 20/21**

TPM-B: Biokinetics/Bioeffects of the Actinides

Co-Chairs: Tom LaBone and Gus Potter

2:15 PM **TPM-B.1**
Dose Reconstruction Validation and Epidemiological Studies for the Russian Extended Techa River Cohort. *M. Degteva, L. Anspaugh, B. Napier, R.T. Bell; Urals Research Center for Radiological Medicine, University of Utah, Battelle Pacific Northwest Laboratories, US Department of Energy*

2:30 PM **TPM-B.2**
Determination of Radiation Doses Received by Workers at the Mayak Production Association. *E. Vasilenko, V. Khokhryakov, S. Miller, J. Rabovsky; Mayak Production Association, Southern Ural Biophysics Institute, University of Utah, US Department of Energy - MD*

2:45 PM **TPM-B.3**
Acute Radiation Syndrome among Nuclear Workers of Mayak Production Association. *T.V. Azizova, M.V. Sumina, V.S. Pesternikova, S.V. Osovets, N. Wald; Southern Ural Biophysics Institute, Russia, University of Pittsburgh*

3:00 PM **TPM-B.4**
Influences of Radiation and Non-Radiation Factors in the Occurrence of Liver and Biliary Tract Malignancies among Plutonium Production Workers. *Z. Tokarskaya, G. Zhuntova, B. Scott, V. Khokhryakov, E. Vasilenko; Southern Ural Biophysics Institute (SUBI), Russia, Lovelace Respiratory Research Institute, Mayak Production Association (MPA), Russia*

3:15 PM **TPM-B.5**
Human Wound Site Tissue Contaminated with Actinide Material. *J.J. Russell; Washington State University*

3:30 PM **TPM-B.6**
Application of a Four-Compartment Wound Model to Wounds Incurred by Former Workers at Rocky Flats. *R. Falk, N. Daugherty, J. Aldrich, D. Hilmas; Oak Ridge Associated Universities-Arvada, CO*

3:45 PM **BREAK**

4:15 PM **TPM-B.7**
²³⁸Pu, ²³⁹Pu, ²³⁷Np, ²⁴¹Am, Depleted and Enriched Uranium. Results of Radiotoxicological Studies at Branch No. 1 of the State Research Center - Biophysics Institute during 1949-1999. *E. Lyubchansky, A. Sokhranich, Z. Kalmykova, T. Levdik, O. Kuzmenko; Ozyorsk, Russia*

4:30 PM **TPM-B.8**
Use of NUREG/CR-4214 Models to Estimate Risks for Deterministic Health Effects of Inhaled Weapons Grade Plutonium. *B. Scott, V. Peterson; Lovelace Respiratory Research Institute, ABCConsulting, Inc.*

4:45 PM **TPM-B.9**
Uranium Lung Solubility Class Selection at Bechtel Jacobs Company LLC-Operated Facilities. *T. Rucker, K. Fleming, R. Moody, M. Johnson, S. Stevens, S. Green; Science Applications International Corporation, Bechtel Jacobs Company, LLC*

5:00 PM **TPM-B.10**
Absorbed Doses to the Stomach Walls and Colon of the Residents of Rongelap and Utirik Atolls due to their Initial Three-Day Intake of Radioactive Fallout from the Bravo Detonation. *D. Moeller, C. Sun; Dade Moeller & Associates, Inc., Brookhaven National Laboratory*

5:15 PM **TPM-B.11**
Radiological Assessment of the Aerosol Activity Size Distribution at the Object Shelter Conditions. *O. Bondarenko, P. Aryasov, D. Melnichuk, S. Medvedev; Radiation Protection Institute, Ukraine*

5:30 PM **TPM-B.12**
Current Status of Individual Internal Dose Monitoring at the Object Shelter (The Chernobyl Site). *O. Bondarenko, P. Aryasov, D. Melnichuk, S. Medvedev, A. Korneev, A. Dmitrienko; Radiation Protection Institute, Ukraine, Specialised State Enterprise Chernobyl NPP, Ukraine*

TUESDAY

2:30 - 3:30 pm Room: **CC 22/23**

TPM-C: Environmental

Co-Chairs: Geoffrey Eichholz and Edward Tupin

2:30 PM **TPM-C.1**
Estimates of Radiation Doses to Members of a Cohort Residing in Villages near the Semipalatinsk Nuclear Test Site. *S. Simon, K. Gordeev, A. Bouville, N. Luckyanov, C. Land, Z. Carr; National Cancer Institute, Institute of Biophysics, Moscow, Russia*

2:45 PM **TPM-C.2**
Residential TENORM in Upstate South Carolina. *R.L. Woodruff, T.A. DeVol; Environmental Engineering & Science, Clemson University*

3:00 PM **TPM-C.3**
A Three-Dimensional Indoor Aerosol Transport Model. *E. Sajo, S. Raja; Louisiana State University*

3:15 PM **TPM-C.4**
Overview of CDC's Ongoing Review of Historical Operations at Los Alamos. *T. Widner, J. Buddenbaum; ENSR International*

3:30 PM **BREAK**

4:00 - 5:45 pm Room: **CC 22/23**

TPM-C: Decommissioning

Co-Chairs: Steven Simon and William Passeti

4:00 PM **TPM-C.5**
NRC MARSSIM-Lessons Learned - Technical Reviewer's Point of View. *J.-C. Dehmel, S. Schneider; US Nuclear Regulatory Commission - Washington, DC*

4:15 PM **TPM-C.6**
Benefits of Using ANSI/HPS N13.12-1999. *P.S. Stansbury, D.J. Strom; Pacific Northwest National Laboratory*

4:30 PM **TPM-C.7**
An Investigation of Resuspension Factors During the Decommissioning, Decontamination, and Demolition of a U.S. Department of Energy Facility. *T.A. Brock, D.J. Strom, P.S. Stansbury; Oregon State University, Pacific Northwest National Laboratory*

4:45 PM **TPM-C.8**
Application of a Stochastic Resuspension Factor Model in an Urban Environment. *C. Miller; Centers for Disease Control and Prevention*

5:00 PM **TPM-C.9**
Problems Encountered During the Radiological Remediation of Old Buildings. *K. Krieger, R. Cornell, D. Schillings; Earth Tech Inc*

5:15 PM **TPM-C.10**
An Approach to Decommissioning a Medical Research Facility. *V. Evdokimoff; Boston University Medical Center*

5:30 PM **TPM-C.11**
GTRR Decommissioning: Lessons Learned. *R.D. Ice, N.E. Hertel; Neely Nuclear Research Center, Georgia Institute of Technology*

2:30 - 5:00 pm Room: **CC 24/25**

TPM-D: Medical Health Physics

Co-Chairs: Mike Grissom and Kelly Clasic

2:30 PM **TPM-D.1**
Research Radiation Studies: Improving Informed Consent. *L. Coronado, S. Googins; National Institutes of Health*

2:45 PM **TPM-D.2**
Informing Research Subjects about Radiation. *K. Austin, L. Coronado, S. Googins; National Institutes of Health*

3:00 PM **TPM-D.3**
Challenges of Calculating Effective Dose. *S. Googins, L. Coronado; National Institutes of Health*

3:15 PM **BREAK**

3:45 PM **TPM-D.4**
Patient ALARA Program for Monitoring Fluoroscopy Times in Cardiac Services. *C. Plott, G. Renaldo, B. Reichert, G. Milner, M. Reece; Forsyth Medical Center, University of North Carolina at Chapel Hill*

4:00 PM **TPM-D.5**
Patient Radiation Dose in Percutaneous Vertebroplasty. *B. Schueler; Mayo Clinic*

4:15 PM **TPM-D.6**
A Dose Comparison of CR and DR Chest Examinations of Pediatric Patients. *K. Johnson, D. Hintenlang; University of Florida*

4:30 PM **TPM-D.7**
Cardiovascular CT Dosimetry - Update. *M.R. Sarder, T.T. Yoshizumi, P.C. Goodman, R.E. Reiman; Duke University Medical Center*

4:45 PM **TPM-D.8**
Comparison of Fetal Radiation Exposures from Helical CT and Ventilation Perfusion Scintigraphy for the Diagnosis of Pulmonary Embolism in Pregnant Patients. *M. Sheetz, D. Whitt, J. Rosen, R. Shah; University of Pittsburgh, Magee Womens Hospital*

2:30 Room: **CC 3/4**

Decommissioning Section Meeting

4:00 Room: **CC 5/6**

Radon Section Meeting

WEDNESDAY

7:15-8:15 AM Room: **CC 18/19**
CEL-5 Updated Internal Radiation Dosimetry; ICRP Publication 68. *D. Bernhardt; Salt Lake City, Utah*

7:15-8:15 AM Room: **CC 20/21**
CEL-6 Depleted Uranium, Why Public Concern Is So Great? *E.G. Daxon; U.S. Army Medical Department*

8:30 am - Noon Room: **CC Ballroom A/B**

WAM-A: Government, Medical Health Physics, and RSO Section Plenary Session: Symposium on Homeland Security

Co-Chairs: R. Thomas Bell and Susan Masih

8:30 AM **WAM-A.1**
How Scientific Societies can Contribute to Homeland Security. *A. Brodsky, E. Bailey, C. Plott, K. Langley, B. Wilson, S. Masih, R.T. Bell; Science Applications International Corporation, Department of Health Services, CA, Forsyth Medical Center and University of North Carolina, Chapel Hill, University of Utah, University of Kentucky, Lexington, University of Missouri, Kansas City, MO, US Department of Energy, MD*

9:00 AM **WAM-A.2**
TBD

10:00 AM **BREAK**

10:30 AM **WAM-A.3**
Observations on Government Response on 9/11. *F.J. Bradley; Health Physics Consultant*

10:45 AM **WAM-A.4**
How Can the States Contribute to Homeland Security. *E. Fordham; CRCPD, Inc.*

11:00 AM **WAM-A.5**
Example Programs at the State and County Level. *J. Wills; Ohio Department of Public Safety*

11:15 AM **WAM-A.6**
Incorporating Homeland Security into Public Teacher Continuing Education. *M.E. McCarthy; University of Massachusetts - Amherst*

11:30 AM **Discussion**

Noon **Government Section Business Meeting**

12:15-2:15 pm **PEP Program**

2:30 - 5:45 pm Room: **CC Ballroom A/B**

WPM-A: Government, Medical Health Physics, and RSO Section Session: Symposium on Homeland Security

Co-Chairs: Ian Hamilton and John Wills

2:30 PM **WPM-A.1**
Adapting Recommendations of NCRP Report No. 138 to Education of the Public. *I. Hamilton, J.W. Poston, Sr.; Texas A&M University*

2:45 PM **WPM-A.2**
Preparation of a Concise Pamphlet for Citizen Protection and Fear Prevention. *A. Fentiman, A. Karam; The Ohio State University, University of Rochester*

3:00 PM **WPM-A.3**
Utilizing K-12 School and Higher Education Programs to Incorporate Homeland Security Topics for Public Education. *M.E. McCarthy; University of Massachusetts - Amherst*

3:15 PM **WPM-A.4**
A Practical Guide to Incident Response. *J.G. Barnes; Rocketdyne/Boeing*

3:30 PM **Discussion**

3:45 PM **BREAK**

4:15 PM **WPM-A.5**
Hospital Preparations for Biological, Chemical and Radiation Terrorism. *K. Miller; Pennsylvania State Hershey Medical Center*

4:30 PM **WPM-A.6**
Lessons for Responders from Nuclear Weapons Tests and Radiation Accidents. *A. Brodsky, L.J. Deal, P.S. Harris, M. Stangler, M. Barbier; Science Applications International Corporation, Private Consultants*

4:45 PM **WPM-A.7**
Lessons Learned from the Early Health Physics Responders to the TMI Accident. *S. Porter, Jr., G. Lodde; Porter Consultants, Inc., Health Physics Consultant*

5:00 PM **WPM-A.8**
Lessons Learned from Expert Response Teams. *R. Toohey, R. Goans; Oak Ridge Institute for Science & Education*

5:15 PM **WPM-A.9**
Adapting NCRP Report No. 138 for Training First-Responders. *J.W. Poston, Sr., I.S. Hamilton; Texas A&M University*

5:30 PM **Discussion**

WEDNESDAY

2:30 - 5:30 pm Room: CC 20/21

WPM-B: MARLAP

Co-Chairs: Carl Gogolak and John Griggs

2:30 PM WPM-B.1
An Overview of the Multi-Agency Radiological Laboratory Analytical Protocols Manual. *J. Griggs; US Environmental Protection Agency/NAREL*

2:45 PM WPM-B.2
Data Quality Objectives and the Development of Measurement Quality Objectives. *C. Gogolak; US Department of Energy/EML*

3:30 PM BREAK

4:00 PM WPM-B.3
Multi-Agency Radiological Laboratory Protocols Manual - the Selection and Application of an Analytical Method. *S. Morton; US Department of Energy/RESL*

4:30 PM WPM-B.4
Multi-Agency Radiation Laboratory Protocols Manual - Summary and Applications of Chapters 5, 7 and 8. *D. McCurdy; Duke Engineering*

5:00 PM Panel Discussion

2:30 - 3:45 pm Room: CC 22/23

WPM-C: Radionuclide NESHAPs

Co-Chairs: John Glissmeyer and Andy McFarland

2:30 PM WPM-C.1
NESHAP Monitoring for On-site Receptors. *B. McElhoe; CDM Federal Services Inc.*

2:45 PM WPM-C.2
Deposition in the Stack Sampling System of a Research Facility. *M. Ballinger, D. Edwards, T. Gervais; Battelle Seattle Research Center, Battelle Pacific Northwest National Laboratory*

3:00 PM WPM-C.3
Effects of Particulate Deposition in Air Monitoring System - Case Study of an Aging Facility. *J. Glissmeyer, K. Hadley, L. Diediker; Pacific Northwest National Laboratory, Fluor Hanford*

3:15 PM WPM-C.4
Results of Mixing Experiments with Scale Models. *C.A. Ortiz, D.L. O'Neal, A.R. McFarland; Texas A&M University*

3:30 PM WPM-C.5
Aerosol Particle Losses in Compound Elements of a Transport System. *N. Ramakrishna, A. McFarland; Texas A&M University*

3:45 PM BREAK

4:15 PM Joint Radionuclide NESHAPs Annual Meeting

2:30 - 4:00 pm Room: CC 24/25

WPM-D: Medical HP Section Session: Shielding for Medical Facilities

Co-Chairs: Kenneth Kase and Jean St. Germain

2:30 PM WPM-D.1
Diagnostic X-ray Shielding; An update from NCRP SC-9. *D.J. Simpkin; St. Luke's Medical Center*

3:00 PM WPM-D.2
Shielding of Medical Accelerator Facilities. *K. Kase; Stanford Linear Accelerator*

3:30 PM WPM-D.3
Shielding of HDR, IVB and PET/CT Facilities. *J. St. Germain; Memorial Sloan-Kettering Cancer Center*

4:00 PM BREAK

4:30 - 5:30 pm Room: CC 24/25

WPM-D: Medical HP and Government Section Session: Regulation in Medicine

Co-Chairs: Richard Vetter and Tom Bell

4:30 PM WPM-D.4
The Advisory Committee on Medical Use of Isotopes - a Health Physicist's Perspective. *R. Vetter; Mayo Clinic*

5:00 PM WPM-D.5
The Role of a State Program in Quality Assurance? The New Jersey Experience. *M. Moore, J. Lipoti; NJ Commission on Radiation Protection, NJ Department of Environmental Protection*

2:30 - 3:30 pm Room: CC 18/19

WPM-E: Regulatory/Legal Issues

Co-Chairs: John Hageman and Ed Bailey

2:30 PM WPM-E.1
The Trefoil Needs Help. *B. Dodd; IAEA, Austria*

2:45 PM WPM-E.2
US Nuclear Workers, Ethics, and the Compensating Wage Differential. *K. Shrader-Frechette; University of Notre Dame*

3:00 PM WPM-E.3
Experience with Initial Implementation of EP Reactor Oversight Process. *R. Sullivan; US Nuclear Regulatory Commission, DC*

3:15 PM WPM-E.4
Closure of Files on Formerly Terminated AEC Licensed Sites in Colorado. *R. Terry; Colorado Department of Public Health and Environment*

3:30 PM BREAK

WEDNESDAY

4:00 - 5:00 pm

Room: CC 18/19

WPM-E:Waste Management

Co-Chairs: Ruth McBurney and Linda Morris

4:00 PM

WPM-E.5

The Use of an Agitator to Decrease Residual Activity of Long Lived Contaminates in the Y-90 Therasphere Delivery Device. *V. Gates, C. Schultz, R. Salem, H. Dworkin; William Beaumont Hospital*

4:15 PM

WPM-E.6

Disposal of Large Quantities of I-129 by Shallow Land Burial at the Savannah River Site, South Carolina. *J. Cook, L. Collard, D. Kaplan, E. Wilhite; Savannah River Technology Center*

4:30 PM

WPM-E.7

Radiation Streaming and Skyshine Assessment for a LLW Assured Isolation Facility. *M. Arno, I. Hamilton; Texas A&M University*

4:45 PM

WPM-E.8

Influence of Source Material and Solids-to-Water Ratio on Cesium Leaching from Cement. *J. Sessoms, D. Stephenson, W. Johnson, M. Rudin; University of Nevada - Las Vegas*

5:45 - 6:30 pm

Room: CC 24/25

HPS Business Meeting

Followed by:

A 30-40 minute presentation: **Orphan Source Recovery in Georgia** about the history of orphan source problems in Georgia and particularly the Radioisotopic Thermoelectric Generators (RTGs). A short videotape showing the recovery of the two unshielded 40,000 Ci sources discovered by woodcutters over Christmas will be played. Two of the woodcutters are still critically ill.

ADJUNCT TECHNICAL MEETING

6:30 - 8:30 pm

Marriott Hotel

Aerosol Measurements

(all presentations are 15 minutes except where noted)

Chair: Morgan Cox

Anthrax and Smallpox to Plutonium and Uranium- Understanding Aerosol Dispersion and Human Exposure. *M. Hoover; NIOSH (30 minute presentation)*

Monitoring a Process Facility Stack for Radon Emissions. *D. Draper, B&W Services*

Operating Experience with the Eberline Alpha-7L CAM at LANL. *D. Wannigman, J.T. Voss; Los Alamos National Laboratory*

Current Status of ANSI N323C. *M. Johnson, M. Hoover; PNNL, NIOSH*

A Comparison of Personnel Air Sampling and Bioassay Data. *R. Redmond; Y-12, Oak Ridge, TN*

Use of Alpha Spectroscopy to Increase Internal Dosimetry Program Sensitivity. *M. Ford; Pantex Plant*

Operating Experience with the LANL Critical Flow Control Orifice in Aerosol Sampling. *T.J. Voss, M. Hoover; Los Alamos National Laboratory, NIOSH*

Wireless Modbus Network of Alpha/Beta Air Monitors with Spectral Capabilities. *S. Lopez; MGPI*

THURSDAY

7:15-8:15 AM Room: **CC 18/19**
CEL-7 Basics of PET. *J. Jacobus; National Institutes of Health*

7:15-8:15 AM Room: **CC 20/21**
CEL-8 Current Status of Agents used in Nuclear Medicine Therapy. *M. Stabin; Vanderbilt University*

8:30 am - Noon Room: **CC 18/19**

THAM-A: Probability of Causation

Co-Chairs: F. Owen Hoffman and Charles Land

8:30 AM THAM-A.1
Report of the NCI-CDC Working Group to Revise the 1985 NIH Radioepidemiological Tables: Overview. *C. Land, E. Gilbert, J. Smith, O. Hoffman, I. Apostoaei, B. Thomas; National Cancer Institute, Centers for Disease Control and Prevention, SENES Oak Ridge, Inc.*

9:00 AM THAM-A.2
The Role of Uncertainty Analysis in Estimating the Probability of Causation of Radiogenic Cancer. *F.O. Hoffman, A.I. Apostoaei, B. Thomas, C. Land, E. Gilbert; SENES Oak Ridge, Inc., National Cancer Institute*

9:15 AM THAM-A.3
Relative Biological Effectiveness Factors for Different Radiation Types. *D.C. Kocher, A.I. Apostoaei, F.O. Hoffman; SENES Oak Ridge, Inc.*

10:00 AM BREAK

10:30 AM THAM-A.4
Transfer of Risk between Populations Applied to Estimating Probability of Cancer Causation. *A.I. Apostoaei, F.O. Hoffman, B. Thomas, C. Land, E. Gilbert; SENES Oak Ridge, Inc., National Cancer Institute*

10:45 AM THAM-A.5
National Academy of Sciences Review of IREP—A Committee Member's View. *D. Stram; University of Southern California - Los Angeles*

11:15 AM THAM-A.6
Results for Specific Case Studies using the Interactive Radioepidemiological Program (IREP). *B. Thomas, F.O. Hoffman, A.I. Apostoaei; SENES Oak Ridge, Inc.*

11:45 AM Discussion

8:30 am - Noon Room: **CC 20/21**

THAM-B: Our Role in Reducing Terror from a Radiological Incident

Co-Chairs: Eric Daxon and Ray Guilmette

8:30 AM THAM-B.1
Science Is Not Enough. *E. Daxon; U.S. Army*

9:00 AM THAM-B.2
Canada, Depleted Uranium, and Belief Systems. *K. Scott; Canadian Forces Medical Services*

9:30 AM THAM-B.3
Uranium Mining: a Legacy of Fear in Navajo Communities. *T. Coons; Saccomanno Research Institute*

10:00 AM BREAK

10:30 AM THAM-B.4
Psychosocial Effects of Radiological Terrorism Incidents. *S.M. Becker; The University of Alabama at Birmingham*

11:00 AM THAM-B.5
Helping to Prevent Terror Following a Radiological Incident. *C. Salter; Armed Forces Radiobiology Research Institute*

11:30 AM THAM-B.6
Getting Past Risk Communication. *J. Graf; Los Alamos National Laboratory*

8:30 - 11:15 am Room: **CC 22/23**

THAM-C: RSO Section Session

Co-Chairs: Mack Richard and RSO Section President-elect

8:30 AM THAM-C.1
A Model to Determine if External Personnel Monitoring is Required in a Research Laboratory. *D. Burkett, C. Elam, D. Anglin; Vanderbilt University*

8:45 AM THAM-C.2
Statistical Validation of a Commonly Used Method for Personnel Dosimetry Issuance Determinations. *R.A. Gorham, R.J. Emery; University of Texas - Houston*

9:00 AM THAM-C.3
Conceptual Method to Dispose of Low Enriched Radioactive Materials in Waste at a Permitted Commercial Disposal Facility. *D. Draper, M. Morris, J. Newburn; BWXT, Nuclear Fuel Services, IT Group*

9:15 AM THAM-C.4
A Project Teams Approach for Improving Radiation Safety Programs. *B. Edwards; Duke University*

9:30 AM BREAK

10:00 AM THAM-C.5
Cause and Effects of a Cease and Desist Order. *M. Reynolds; Western Kentucky University*

THURSDAY

10:15 AM **THAM-C.6**
Tropical Storm Allison's Inundation of a 40 Mev University Cyclotron. *R. Emery; University of Texas Health Science Center at Houston*

10:30 AM **THAM-C.7**
Radiation Safety Issues in Large Open Laboratories. *V. Morris; University of Cincinnati*

10:45 AM **THAM-C.8**
Release Criteria for I-131 Therapy Patients. *M.L. Richard; Indiana University Medical Center*

11:00 AM **THAM-C.9**
Training for New RSOs - What is Most Important? *R. Johnson; Radiation Safety Academy*

11:15 AM **RSO Section Meeting**

8:30 - 11:15 am **Room: CC 24/25**

THAM-D: The History and Development of Portable Gamma Spectrometers: Use and Practical Applications

Co-Chairs: Syd Porter and Stanley DeFilippis

8:30 AM **THAM-D.1**
A Historical Perspective on the Applications of *in situ* Gamma-Ray Spectrometry. *K. Miller, P. Shebell; US Department of Energy Environmental Measurements Laboratory*

8:45 AM **THAM-D.2**
in-situ Germanium Gamma Spectroscopy, Where We Are; How We Got Here; and Where We Are Going. *F. Bronson; Canberra*

9:00 AM **THAM-D.3**
Performance Standard on the Calibration of Germanium Detectors for *in-situ* Gamma Ray Measurements. *P. Shebell; US Department of Energy Environmental Measurements Laboratory*

9:15 AM **THAM-D.4**
SAM's Birth and Milestones to Maturity. *J. McQuaid; Berkeley Nucleonics Corp.*

9:30 AM **THAM-D.5**
History of Portable Germanium Detector Spectroscopy Systems. *R. Keyser, T. Twomey; ORTEC*

9:45 AM **BREAK**

10:15 AM **THAM-D.6**
RadSmart, Hand Held Gamma Ray Spectrometer/Survey Meter with On-Board, Isotopic Quantification. *R. Polichar, J. Rolph, L. Bray, D. Emmons, A. Polichar; Science Applications International Corporation*

10:30 AM **THAM-D.7**
Development and Use of Multipurpose Handheld Gamma Spectrometers. *R. Arlt, J. Stein, J. Fellingner, F. Lueck, A. Kreuels; International Atomic Energy Agency, Austria, target systemelectronic GmbH*

10:45 AM **THAM-D.8**
The Evolution of Multi-Detector Spectrometer Systems for Field Applications. *J. Cox; Austria*

11:00 AM **THAM-D.9**
The Use of Hand Held Gamma Spectrometers in Law Enforcement. *K.E. Duftschmid; Techn.University Graz, Austria*

12:15-2:15 pm **PEP Program**

AAHP Courses

Saturday, June 15, 2002, 8:00 am-5:00 pm

Each Course is worth 16 CECs

AAHP COURSE 1

RADIOACTIVITY IN RECYCLED MATERIALS AND MUNICIPAL AND RESIDUAL WASTE. *Tony LaMastra, Health Physics Associates, Inc.*

This course will discuss the types and forms of radioactivity likely to be present in recycled materials and in waste traditionally considered to be non-radioactive, monitoring methodologies being used and the problems introduced by the monitoring of these recycling and waste streams for radioactivity, likely detection efficiencies, current and proposed management approaches, including the proposed NCRP report, Managing Potentially Radioactive Scrap Metal. If available, a copy of the NCRP report will be distributed.

AAHP COURSE 2

FOOD IRRADIATION TECHNOLOGY. *Daniel L. Engeljohn, US Department of Agriculture, Washington, DC*

This session will discuss the role food irradiation can play in reducing foodborne illness and in increasing the availability of exotic fruits and vegetables. Information will be presented on the concepts underlying the food irradiation process, as well as the operational issues associated with implementing the technology, providing government oversight, and educating the food industry and consumers about the technology.

AAHP COURSE 3

APPLICATION OF ANSI/HPS N13.1-1999: SAMPLING AND MONITORING RELEASES OF AIRBORNE RADIOACTIVE SUBSTANCES FROM THE STACKS AND DUCTS OF NUCLEAR FACILITIES. *John Glissmeyer, Pacific Northwest National Laboratory.*

This course will cover the content of the standard ANSI/HPS N13.1-1999, *Sampling and Monitoring Releases of Airborne Radioactive Substances From the Stacks and Ducts of Nuclear Facilities*. Subject areas that will be addressed include:

- Objectives and approaches for sampling programs
- Qualified sampling locations
- Sampling system design
- Quality assurance and control
- Misconceptions about the size of particulate material in nuclear facilities
- Sample collection, and
- Special considerations for sampling radioiodine and tritium.

Class exercises will explore the basic concepts of estimating potential uncontrolled plant emissions, the collection and interpretation of contaminant mixing data and flow characterization data, estimating particle line loss, and the parameterization of scale model tests. Class attendees will be able to apply the concepts to their own facilities.

Professional Enrichment Program

Sunday, June 16 Through Thursday, June 20, 2002

The Professional Enrichment Program (PEP) provides a continuing education opportunity for those attending the Health Physics Society Annual Meeting. The topics for the PEP are specifically chosen to cover a broad range of subjects. Some of the sessions are popular repeats from last year and the rest are completely new lectures in response to your suggestions. The two hours allotted each course ensure that the subjects can be discussed in greater depth than is possible in the shorter programs offered elsewhere in the meeting. The class size is limited to allow for interaction between the lecturer and the students.

The speakers, course titles, and the times for each presentation are listed on the following pages. On Sunday, June 16, the day before the Annual Meeting, a series of 30 courses will be offered. The Sunday sessions begin early to allow for 3 sessions that day. The program begins at 8:00 am and finishes at 4:00 pm. The Welcome Reception begins at 6:00 pm.

In addition to the above-mentioned sessions for Sunday, six PEP lectures are scheduled on Monday, Tuesday, Wednesday, and Thursday afternoons. Routine PEP attendees should note that the times of the mid-week sessions are 12:15 - 2:15 p.m. again this year, to be consistent with the scheduling of the Annual Meeting.

Registration for each two-hour course is \$40 and is limited to 60 attendees on a first-come, first-served basis. Those whose registrations are received before the pre-registration deadline will be sent confirmation of their PEP course registration.

In order to further the Society's commitment to the next generation of Health Physicists, students with a current ID card will be admitted free of charge to any sessions which still have space available after the waiting list has been admitted. Student admission will be on a first-come, first-served basis and

will only begin 15 minutes after the start of the session to allow for completion of ticket processing.

Continuing Education Credits from the American Academy of Health Physics have been granted for the PEP. The PEP lecture registration fees should be included with registration fees for the Annual Meeting. The PEP registration is included on the Annual Meeting Pre-registration form.

Please Note!!

Please remember to be on time for your sessions. The lecturer will begin promptly at the scheduled time. Please allow time for check-in. The HPS reserves the right to schedule a substitute speaker or cancel a session in case the scheduled speaker is unavailable.

Attendees not present at the starting time of the session cannot be guaranteed a space, as empty spaces will be filled from the wait list at that time. Spaces left after the wait list has been admitted may be filled with students. If your duties at the meeting cause you to be late for your lecture (e.g., chairing a session), contact the PEP registration desk so that your name can be placed on the waiver list and your space held. We understand that there are circumstances that will prevent you from being on time, but we do not want to turn people away and have empty seats due to no-shows.

Note: Each course is two (2) hours in length and will earn four (4) continuing education credits.

Refund Policy

Requests for PEP refunds will be honored if received in writing by May 14. All refunds will be issued AFTER the meeting. Exceptions will be handled on a case by case basis.

1-A Currently Applicable ANSI and International Standards for Health Physics Instruments. M. Cox; Santa Fe, New Mexico

This interactive presentation is a brief review of American National Standards Institute (ANSI) and International Electrotechnical Commission (IEC) standards covering health physics instrumentation. This review includes the status of revised and new standards demanded by new technology, more restrictive regulation or a combination of both. The initial focus is on a discussion of the various standards organizations, how they function, composition of membership, scope and objectives, schedules and timelines and the impacts of these standards. Next the review covers the standards encompassing some of the various types of health physics instrumentation, including portable survey meters with various levels of sensitivity for various applications, aerosol monitors and samplers, installed radiation monitoring systems such as the wide variety of contamination and area, personnel and equipment types, plus special monitors such as those used for tritium and noble gases, radon and radon progeny. Other types of health physics instruments covered include personnel, area and environmental dosimeters. Audience participation is necessary for the overall success of this presentation. This brief summary is augmented with more details of several important standards in an "HP instruments standards workshop" which follows shortly.

1-B NEPA Strategy and Analysis: The Health Physicist's Perspective. T. Ikenberry; Dade Moeller & Associates, Inc.

An important step in the progress of large Federal projects is the analysis of potential environmental impacts required by the National Environmental Policy Act (NEPA). This presentation examines the NEPA process and analyses from the health physicist's perspective, focusing on the evaluation of environmental impacts of projects where radiation or radioactive materials may be produced, stored, handled, or disposed. A brief introduction to NEPA and the NEPA process is provided, then activities and strategies are examined that a health physicist would employ in preparing the prospective analysis for an environmental assessment or environmental impact statement. The potential impacts from several different alternative actions may need to be examined, and the differences between them clearly explained. For example, a "no action" alternative may differ considerably from several prospective "actions". Typically a health physicist would mainly be concerned with the radiation dose to the public and workers from releases of man-made radioactive material or direct exposure to man-made radiation from the proposed operations, but under NEPA this involvement may include a much wider range of health and safety evaluations. The evaluation and description of "cumulative" impacts often represents a particular challenge. Because the NEPA process has a strong public involvement aspect, writing in a manner readily understood by the public is very important, as is interacting with members of the public at public meetings and responding to public comments both formally and informally.

1-C The History of Release Criteria: From de minimis to BRC, to Clearance. W. Kennedy; Dade Moeller & Associates, Inc.

Over the past forty years, attempts have been made by several organizations to develop and define a lower level for radiation protection dealing with trace amounts of either surface or bulk radioactive contamination. Release criteria are important both in terms of metal recycle from nuclear facilities, and for establishing general criteria for the release of materials from radiological control. Early attempts included those of the Atomic Energy Commission (AEC) to develop Regulatory Guide 1.86 and the early efforts of the Health Physics Society, with the American National Standards Institute (ANSI) to develop early drafts of ANSI Standard N13.12. On the international front, early efforts included those of the International Atomic Energy Agency (IAEA) to develop de minimis concentrations, first for ocean disposal, then later for disposal of material to municipal landfills. More recent efforts include the U.S. Nuclear Regulatory Commission's attempts to develop a "Below Regulatory Concern" policy, the IAEA's program on Clearance, and the final ANSI Standard N13.12 on "Surface and Volume Radioactivity Standards for Clearance." The purpose of this course is to provide an historical overview of the evolution of release criteria, both in the United States and abroad, as applied to surface and volume radioactive contamination.

1-D U.S. Environmental Protection Agency's Risk Assessment Methodology for Radioactive Contaminants. A. Fellman; CSI - Radiation Safety Academy

Under the Superfund law, the U.S. Environmental Protection Agency (EPA) must establish the existence of an unacceptable risk to human health and/or the environment prior to authorizing the expenditure of resources for site remediation. Absent such a risk, a site is ineligible for cleanup under the Superfund remedial program.

EPA has published several Risk Assessment Guidance (RAGs) documents which detail the approved methodology for performing quantitative risk assessments at Superfund sites. This PEP session will consist of a review of the major elements of a risk assessment as described in the RAGs methodology, including identification of radionuclides of concern, determination of exposure point concentrations, and analysis of environmental pathways, future use scenarios, and exposure pathways. The various sources of uncertainty will also be discussed.

Students should bring a calculator to this PEP session. During the second hour, students will be asked to work (in groups) on a sample problem to evaluate the magnitude of risk posed by radionuclide contamination of soil and groundwater.

1-E Accelerator Radiation Safety. V. Vylet; Duke University

The purpose of this course is to examine general aspects of radiation safety programs at accelerator facilities. The topics described include: characterization of radiation hazards and implications for facility design, principles of safety system design and implementation, radiation monitoring and instrumentation, operational and administrative

aspects. Since the scope of a particular program will greatly depend on the type and size of a facility, we will illustrate the above aspects with examples from several existing accelerator installations in medical, university and DOE settings. The course will include a brief overview of existing guidance documents and recommended literature.

1-F Introduction to MARLAP. P. Frame; Oak Ridge Institute for Science and Education

MARLAP (Multi-Agency Radiological Laboratory Analytical Protocol) is a manual currently being developed by a multi-agency committee. In some ways it can be considered a laboratory counterpart to MARSSIM. MARLAP, however, does not restrict itself to the decommissioning arena. Its intent is to provide guidance for "the planning, implementation, and assessment of projects that require the laboratory analysis of radionuclides." At present the document is in draft form. The expectation is that a final version, not significantly different from the draft, will be released by the summer of 2002. This presentation will focus on Part I of the manual which is primarily intended for project planners and managers. Part II, which will not be covered, provides a general overview of the various options for the laboratory analysis of radionuclides and the related technical issues. Topics that will be reviewed include:

- The Directed Planning Process
- The development of a Statement of Work (including the Measurement Quality Objectives and the Analytical Protocol Specifications). Of necessity, this will require a brief consideration of the gray region, and the acceptable rates of Type I and Type II errors.
- The selection of the analytical protocols.
- The evaluation of the contracting laboratory.
- Data evaluation (including data validation and verification).

This program assumes that the attendees have no working knowledge of MARLAP and are basically unfamiliar with the data quality objectives process, data validation, data verification, etc.

1-G Military Uses and Exposures to Depleted Uranium. M. Melanson; U.S. Army Medical Department

The United States Department of Defense used depleted uranium anti-armor munitions for the first time during the 1991 Persian Gulf War (Operation Desert Storm) and more recently the North Atlantic Treaty Organization (NATO) conducted airstrikes in Bosnia and Kosovo using depleted uranium munitions. It is also used in armor on the Abrams series tanks. Since its first use in combat, it has been labeled as everything from "nuclear waste" to the "silver bullet" that won the Gulf War. Depleted uranium has been allegedly linked to illness in Gulf War Veterans, to cancers in Iraq, and to widespread environmental poisoning in the Balkans. During this presentation, the military aspects of depleted uranium use in munitions and armor will be explained. Also, the Army's effort to assess uniquely military exposure scenarios will be presented to include a discussion on the challenges of sampling depleted uranium air-

borne concentrations during the violent penetration of armor by depleted uranium penetrators. The talk will also highlight the speaker's observations of the international scientific efforts to assess the health and environmental impacts of depleted uranium by the International Atomic Energy Agency, the United Nations, and the World Health Organization and his insights into the ongoing international political controversies surrounding this unique metal.

1-H Facility Decommissioning Surveys: Instrumentation Selection and Survey Strategies. S. Brightwell; Professional Radiation Consulting, Inc.

Radiation detection instrumentation consists of useful and integral components for radiological facility assessment and decommissioning processes. With the newly promulgated decommissioning rule establishing cleanup criteria that are in the range of background radiation levels, close attention must be paid to the selection and operational parameters of instrumentation. The consequences of poor instrumentation selection or setup could include releasing a facility that exceeds the release criteria, or performing unnecessary/expensive remediation of a facility that meets the release criteria.

Equally as important as the selection of instrumentation are the survey methods for which they are put to task. In recent years, the Multi-Agency Radiation Survey and Site Investigation Manual (MARSSIM) has become the standard for performing statistically based decommissioning surveys. Although its utility is unquestionable, even those who developed MARSSIM readily agree that it is not all encompassing, and that there are certainly other viable and statistically defensible survey methods that may be less expensive based on facility-specific radiological conditions.

This PEP session focuses on strategies for selecting radiation detection instrumentation and subsequent survey methods for performing effective and economical facility surveys based on facility-specific radiological conditions.

1-I Analysis of Radiotherapy Misadministrations: Sources of Problems, Lessons to be Learned. B. Thomadsen; University of Wisconsin - Madison

Health care organizations and the general public have become much more aware of mistakes happening in medical settings. Gathering data on errors is most often a difficult problem, since, for many reasons, hospitals are reluctant to share that information. The reports of misadministrations involving radioactive materials to the U.S. Nuclear Regulatory Commission offer a unique opportunity to investigate errors in a small set of medical procedures across institutions. This presentation discusses an analysis of the reported misadministrations involving brachytherapy.

For each event, the investigators talked with one of the physicists involved to clarify details that may not have been accurate in the NRC release. Physicists at only two facilities refused comment. The events were studied by a health physicist and an industrial engineer using the tools that should be applied in any event analysis as now required by the Joint Commission on Accreditation of Healthcare Organizations. The process will be discussed during the presentation.

For high dose-rate brachytherapy, the most significant cause of errors involved failure to change default settings for the treatment distance. For all types of brachytherapy, using factors in the calculation based on the wrong source strength quantities commonly lead to errors. Ineffective use of verification procedures often accompanied other errors allowing the events to occur.

Events are almost always due to multiple causes. The findings of the analysis correspond closely with those of studies in other fields requiring high accuracy, such as aviation.

1-J Laser Safety Basics (Lasers Part 1). T. Johnson; Uniformed Services University

This class is designed to familiarize attendees with basic laser operation, the electromagnetic spectrum and laser terminology. Common uses of lasers will be discussed, along with the hazards associated with each. Laser pointers, supermarket scanners, laser printers and surgical laser hazards and their potential for injury will be presented. The laser classification system and photo-biology basics will also be covered. The class will assume no prior knowledge of lasers.

Class objectives:

- Understand how a laser works and basic laser terminology
- Recognize the hazards associated with the different classes of lasers
- Understand which types of lasers present the most immediate hazard
- Determine the sensitive tissue for different laser wavelengths

Sunday, June 16 - 10:30 AM-12:30 PM

2-A Health Physics Instruments Standards Workshop. M. Cox (moderator) and several other instruments standards experts

This "workshop" is a logical sequel to the earlier PEP course covering ANSI and IEC health physics instruments-related standards. Here the panel of standards experts goes into more detail for some of the more important instrument standards to health physicists. Some of the specific ANSI standards covered are: ANSI N323A for portable survey meters; 323B covering portable survey meters for near background measurements; 323C for aerosol sampling and monitoring; 323D for fixed or installed radiation monitoring systems such as contamination and area monitors; ANSI N42.17A for portable survey meters and N42.17B for aerosol monitoring; ANSI N42.20 for alarming electronic dosimeters; ANSI N42.18 covering on-site aerosol monitoring; and ANSI N320 for emergency level monitoring following a nuclear reactor accident. Some of the IEC instrument standards that can be included are those related to radioactive aerosol measurements, liquid measurements and aerial surveillance of terrestrial gamma ray sources. Audience participation is a must for this workshop.

2-B New Regulations and Guidance for Dealing With Radioactivity in Solid Waste in Pennsylvania. D. Allard; Pennsylvania Dept. of Environmental Protection

The Pennsylvania Department of Environmental Protection has the responsibility for protecting the health and safety of the citizens in the Commonwealth, and the environment, from hazardous material contaminants. This includes most sources of radiation. With increasing frequency, radioactive material (RAM) is detected in municipal and residual solid waste by radiation monitors installed at processing and disposal facilities. The vast majority of the detection events are due to short-lived nuclear medicine radionuclides (e.g., I-131, Tc-99m, Tl-201, etc.). However, often naturally occurring radioactive material (NORM), technologically enhanced NORM, consumer products with RAM, or lost sealed sources (e.g., Ra-226, Cs-137, Ir-192) are detected. These materials that set off facility radiation alarms may be regulated through specific or general license, but more likely are deregulated, exempt or unregulated. Additionally, in the past there have been no federal or state regulatory requirements to have radiation monitors at solid waste facilities, nor standards for alarm set point, system background limit, or gamma energy discrimination level. Regardless of the probable type of RAM in the solid waste (i.e., short-lived medical radionuclides), Department Radiation Protection Program staff promptly respond to numerous alarms on a weekly basis. This has caused a measurable impact on other program activities, such as x-ray equipment and RAM user inspections. With the potential for serious impact on human health, safety and the environment from some types of RAM found in the solid waste stream, the Department Bureau of Radiation Protection and Land Recycling & Waste Management have jointly developed regulations requiring monitoring for radiation and radioactive materials at all municipal and residual solid waste facilities in Pennsylvania. A comprehensive guidance document has also been developed for the regulated community, to assist with implementation during a 2-year transition phase. This presentation describes the nature of the problem, program experience, new regulatory limitations and radiation monitoring requirements, and alarm set point and equipment standards. Also outlined are the required facility Action Plan, instrumentation performance checks, training and records, and the public dose limits that will be applied to operations and effluents. A graded response to alarms at two radiation Action Levels, with appropriate onsite RAM characterization, is expected to allow facilities and the Department to more effectively manage the radioactive materials that might be discovered in solid waste.

2-C Environmental Radiation Exposure Litigation, Part 1. R.H. Johnson; Schmeltzer, Aptaker & Shepard, P.C.

This is the first of two lectures concerning environmental radiation litigation. Two case studies (based on actual cases), the first involving a uranium mill and the second involving petroleum production activities, will be used to discuss this type of litigation. This lecture will focus on lawyers and health physicists working together on issues involving radiation measurements, dose calculations, the preparation of expert reports, deposition and trial testimony. Special emphasis will be placed on the vital role of health physicists

as consultants and/or expert witnesses during the investigatory, discovery and trial phases of radiation lawsuits. Procedures for the effective direct and cross-examination of scientific witnesses will be considered. Methods used for persuasively communicating these scientifically complicated concepts to jurors and the general public will be demonstrated.

2-D Fundamentals of External Dosimetry. H. Prichard; Auxier & Associates, Inc.

This course provides an overview of the principles of external dosimetry, with emphasis on the dosimetry of photons. Fundamental dosimetric quantities are reviewed, and the relationships between physical, radiation protection, and operational quantities are discussed. The response characteristics of a number of common instruments and dosimeters will be discussed in terms of these quantities, and guidance relating to accurate exposure assessment in the field will be reviewed.

2-E Introduction to Food Irradiation. G. Claycamp; US Food and Drug Administration

Food irradiation has been used for decades to preserve foods, inhibit sprouting in roots, and to reduce or eliminate contamination by harmful bacteria, yeasts and molds. While the safety of irradiated food for human consumption is grounded in peer-reviewed research spanning nearly a century, the public has been slow to accept ionizing radiation in routine food processing. Nevertheless, outbreaks food-borne illness and concern about bioterrorism have fueled interest in the topic, in turn suggesting that continued expansion of food irradiation is on the horizon. The overall objective of the course is to provide health physicists with a basic background and resource material on food irradiation. The course will begin with a review of fundamental radiobiology and the physicochemical aspects of irradiated animal and plant tissues. These topics will be followed by an examination of the efficacy of ionizing radiation in inactivating pathogens and the likelihood that toxicants could be formed as unwanted by-products of irradiation. A brief look at the myriad of regulations governing food quality and safety will be presented. Finally, benefits and risks from food irradiation will be presented in the final portion of the course, including consideration of both real and perceived health risks to the public and to radiation workers. (The opinions expressed here are those of author and do not represent opinion or policy of the FDA.)

2-F Backgrounds, Detection Limits, and Treatment of Uncertainties in Survey Data, Part 1. J. Shonka; Shonka Research Associates, Inc.

This course will review the basic statistical elements of radiation detection and data analysis. It will provide users with the means to evaluate and treat the data from surveys and to assess the technical adequacy of a survey program. These methods, not in common use, include the establishment of the inherent background in any survey unit without the direct need for comparison to reference areas, and an efficient sorting method that can provide direct evidence for the presence (or absence) of contamination, permitting consideration of additional confirmatory measurements. Meth-

ods to control and limit the uncertainties of radiation measurements using commonly available instrumentation will be discussed.

The MARSSIM tests are relatively insensitive for the detection of small quantities of localized radiation, as their emphasis is on comparisons of differences. MARSSIM stresses the need for scan surveys to assure that localized sources of contamination are identified and considered. More sensitive tests can be performed using simple graphical techniques. These tests will be demonstrated using real survey data. The course will show that a properly performed survey is an element of an overall program of contamination control that exploits a defense in depth approach that includes taking credit for the multiple surveys normally performed in the course of routine operations or decommissioning.

Part I of this course includes tutorials on normal and log-normal statistics and plotting of survey data. Factors that create large uncertainties in survey data will be described. Methods for separating background readings from areas of contamination will be demonstrated.

2-G Radioactive Materials Transportation, Part 1. S. Austin; CSI - Radiation Safety Academy

This session is Part 1 of a two-part series. This session will review Nuclear Regulatory Commission and Department of Transportation regulations concerning the transportation of radioactive materials. During this first part we will review DOT and NRC requirements for training of HAZMAT employees, classification of hazardous materials, DOT and NRC exemptions, normal form and special form radio active materials, limited quantities of materials and articles and instruments, low- specific activity shipments (LSA-I, LSA-II, LSA-III), and surface contaminated objects (SCO-I and SCO-II). We will review requirements for radioactive material packagings, design requirements for Type A packages, and labeling of radioactive material packages.

2-H Biological Defense Mechanisms Induced by Low Doses of Ionization Radiation. D.R. Boreham; Chalk River Laboratories

Radiation protection practices are in place because exposure to large doses of ionizing radiation is known to cause harm to living organisms. Radiation can alter the genetic program contained within the DNA of living cells and if the genetic information is damaged or altered the cell may become cancerous. However, cells have evolved efficient mechanisms that protect their DNA and repair damaged DNA or eliminate cells that contain abnormal DNA.

The presentation will focus on two of these cellular protective mechanisms: the adaptive response and apoptosis. The adaptive response has been well characterized in many organisms including humans. When cells are exposed to small doses of radiation, they can subsequently undergo an adaptive response and increase their ability to repair carcinogenic damage. This transient cellular state of resistance is believed by some scientists to reduce the health risks associated with radiation exposure. Apoptosis, another cellular mechanism that is responsive to low doses of radiation, can also function to alter the biological outcome of radiation exposure. It is a genetically programmed form of cell

death or cell suicide that can be selectively remove damaged cells from the population and therefore eliminate them as a potential cancer risk to the organism.

The implications of the above studies in radiation protection at low doses and dose-rates, near background radiation levels, will be discussed; particularly, the challenges that such studies pose to current radiation protection practices based on the Linear No-Threshold (LNT) hypothesis.

2-I Recent Advancement of CT Technology and Associated CT Dosimetry in Adult and Pediatric Protocols. T. Yoshizumi; Duke University

This is an introductory course for audiences with no special background in CT. Computed tomography (CT) has been revolutionized by the technical advances in the last ten years. Major advances include spiral CT in 1989 and multi-detector system in 1998. We now have CT fluoro and Cardiovascular CT in our clinical protocols. At the same time, we just began to understand substantially higher dose issues in multi-detector system.

This course will present:

- (1) A brief review of CT history;
- (2) A brief overview of recent technological advances in spiral CT and multi-detector CT;
- (3) A review of various dose indexes such as CTDI, weighted CTDI, and dose-length product (DLP);
- (4) A technical review of CT fluoro, cardiovascular CT, and associated dosimetry issues;
- (5) A review of various CT dose estimation methods including a Monte Carlo method, manual hand calculations, and direct measurements;
- (6) A review of current dosimetry issues in pediatric CT, CT fluoro, cardiovascular CT, and body CT;
- (7) Fetal dose consultation in pregnant women - important points to remember in doing fetal dose estimation;
- (8) A review of radiation risk issues from CT in recent months.

The student should expect to benefit from the course by gaining basic understanding of recent technological advances of CT, how to estimate organ doses from modern CT system, and more importantly where to look for information pertaining CT technology and CT dosimetry.

2-J Laser Safety Calculations (Lasers Part 2). T. Johnson; Uniformed Services University

This class assumes attendees have taken the "Laser Safety Basics" class or have a working knowledge of laser terminology and the ANSI Z136.1 standard. Laser safety calculations have undergone significant changes in the latest revision of ANSI Z136.1-2000. Especially significant are changes to Table 5, multi-pulse calculations, and sub-nano second pulse limits. This class will give a brief overview of some of the changes in the standard, cover some examples of multi-pulse calculations utilizing all three of the latest techniques specified by Section 8, and review single pulse, NOHD and OD calculations in detail. Attendees will be presented with a set of laser exposure conditions and perform safety calculations on their own by the end of the session. Each attendee will need a calculator, capable of performing power

calculations ($t^{0.75}$).

Class objectives:

- Be able to utilize Table 5 to find an MPE
- Calculate an MPE for a single pulse or simple multipulse laser
- Recognize factors that influence NOHD, OD and protective eyewear selection

Sunday, June 16 - 2:00-4:00 PM

3-A Some HP Instrument Electronics. M. Cox; Santa Fe, New Mexico

Since the human senses cannot detect radiation, instrumentation has necessarily been developed to provide that vital capability. So, health physics instruments are among the most valuable tools used in the practice of the profession. This presentation is intended to offer the health physicist some perspective into the basic electronics used in these instruments. This paper will cover some of the types of instruments, detectors and electronics used in an illustrative and generic manner, with a minimum of circuit diagrams and specific designs. Many instrument manufacturers and suppliers are sensitive about the precise design of their products because of the keen competition that exists today. So, a few specific designs will be discussed. Some time will be devoted to analog designs of fairly longstanding plus some modern innovations, and otherwise effort will be devoted to current digital technology. Low current measurements will be highlighted, along with instrument stability with time, temperature and shock. Some currently applicable national and international standards for these instruments will be outlined. There will be plenty of time available for questions and answers.

3-B Implications of Proposed Future Human Tissue Studies of the USTUR. J.J. Russell; USTUR, Washington State University

Cancer in a general sense, results from the alteration in the structure or rearrangement of genes that control normal cell growth. These genetic changes usually result from damage to DNA inflicted by environmental agents / insults including radiation. Thus, a human population with well-documented exposures to carcinogens could provide useful tissue samples for studying DNA induced damage of genes involved in cancer progression. Two population groups that meet this requirement are those exposed to the actinides or radium through occupational accidental intakes or medical application. Many of the radium dial painters developed bone cancer, primarily osteosarcoma or carcinoma of the paranasal and mastoid tissues. Because of the low natural incidence of these cancers, alpha particle radiation emitted by radium is ascribed to be the etiological agent. Thus, the USTUR registrant tissues, including those of the dial painters and Thorotrast patients, provide an unusual resource for the study of human tumor induction because, 1) the etiological agent is known; 2) quantitative dosimetry in tissues is possible; and 3) a correlation between a damaged DNA target or gene can be correlated with actinide or radium dose and or dose rate.

We will discuss several ideas that the Registries believe will help identify important biological targets and their dose response relationship to alpha radiation-induced human carcinogenesis. These ideas include:

- a) biological effects of alpha radiation on cell division cycle control.
- b) determine if alpha radiation induced DNA damage is due to alteration in the DNA excision repair (ER) or mismatch repair (MMR) systems.
- c) genomic instability
- d) tumor suppressor genes

3-C Environmental Radiation Exposure Litigation, Part 2. R.H. Johnson; Schmeltzer, Aptaker & Shepard, P.C.

This is the second of two lectures concerning environmental radiation litigation. Two case studies (based on actual cases), the first involving a uranium mill and the second involving petroleum production activities, will be used to discuss this type of litigation. This lecture will focus on lawyers and health physicists (and other scientists interested in radiobiology) working together on issues involving epidemiology, medical causation, health effects risk assessment, and related regulatory remediation standards. Courtroom confusion engendered by misapplication of the linear (no threshold) hypothesis will be examined. The current status of regulatory agencies' TENORM remediation standards will be outlined. Methods used for persuasively communicating these scientifically complicated concepts to jurors and the general public will be demonstrated.

3-D Radiation Dosimetry Management: Dosimeter Characteristics, Quality Assurance, and Investigations. S. Perle; ICN Pharmaceuticals, Inc.

In a litigation-prone society, it is prudent for any business to evaluate its potential exposure to legal action, initiated by either an employee or a member of the general public. This potential is exacerbated when the phobia of radiation exposure and radioactive materials is interjected into the equation. This phobia is fuelled by the perceived risks of radiation exposure, be they fact or fantasy. With the current cancer incidence rate being approximately 1 in every 2.5 individuals (for all types of cancer), it is imperative that all facilities take a proactive look at their business vulnerability. When radiation exposure is the issue, records documentation is a critical factor, and a significant amount of effort should be expended to implement a comprehensive records management system. A comprehensive Radiation Dosimetry Management Program is essential if a business is going to mitigate any regulatory or legal intervention. This PEP session will focus on the basic configuration of various types of dosimeters, i.e., TLD, film, CR39 and criticality accident dosimetry, and the appropriate applications for which each should be selected for personnel use. Also addressed will be the appropriate Quality Assurance activities focused for each type of dosimeter, and, the appropriate requirements for investigations of dosimetry results, records quality management and software quality assurance.

3-E Radiation Quantities and Units: Their Evolution and Proper and Not Quite So Proper Usage and Applications. R. Kathren; USTUR, Washington State University

This PEP course examines the development of radiological quantities and units, showing how and why the current system of SI radiological quantities and units evolved and how the modern quantities and units relate and compare to their predecessors. Correct and proper application and usage of quantities and units will be stressed. Common errors, pitfalls, misuse, misapplication, and areas of abuse will be identified. The presentation is primarily descriptive with a minimum of mathematical rigor and topics considered will include the cgs and SI systems, quantities and units of activity, exposure-dose relationships, absorbed dose and kerma, dose equivalent quantities, and derivative and subsidiary quantities.

3-F Backgrounds Detection Limits and Treatment of Uncertainties in Survey Data, Part 2. J. Shonka; Shonka Research Associates, Inc.

This course will review the basic statistical elements of radiation detection and data analysis. It will provide users with the means to evaluate and treat the data from surveys and to assess the technical adequacy of a survey program. These methods, not in common use, include the establishment of the inherent background in any survey unit without the direct need for comparison to reference areas, and an efficient sorting method that can provide direct evidence for the presence (or absence) of contamination, permitting consideration of additional confirmatory measurements. Methods to control and limit the uncertainties of radiation measurements using commonly available instrumentation will be discussed.

The MARSSIM tests are relatively insensitive for the detection of small quantities of localized radiation, as their emphasis is on comparisons of differences. MARSSIM stresses the need for scan surveys to assure that localized sources of contamination are identified and considered. More sensitive tests can be performed using simple graphical techniques. These tests will be demonstrated using real survey data. The course will show that a properly performed survey is an element of an overall program of contamination control that exploits a defense in depth approach that includes taking credit for the multiple surveys normally performed in the course of routine operations or decommissioning.

Part II of this course will use the methods from Part I along with actual survey data to show how to alter the survey practices to minimize the uncertainties that occur. In addition, a posteriori methods of analysis to account for any remaining uncertainties and to explicitly take credit for multiple surveys will be described.

3-G Radioactive Materials Transportation, Part 2. S. Austin; CSI - Radiation Safety Academy

This session is Part 2 of a two-part series. This session will continue the review Nuclear Regulatory Commission and Department of Transportation regulations concerning the transportation of radioactive materials begun in the previous PEP session. This session will review DOT requirements for marking packages, placarding vehicles, and ship-

ping paper requirements. There will be a review of hazardous material descriptions applicable to radioactive material shipments, emergency response requirements, special requirements for different modes of conveyance. There will be a discussion of U.S. Postal Service requirements for shipment of radioactive materials via U.S. mail. NRC requirements for the receipt and inspection of radioactive materials will be reviewed.

3-H Environmental Continuous Air Monitor (ECAM). J. C. Rodgers; Los Alamos National Laboratory

The lecture on alpha-ECAM technology is designed to provide the participant with background information on topics related to the need for alpha-ECAMs, details of their design, and case studies of some on-going applications. Topical areas to be presented include:

Real-time Alpha-ECAM design factors and performance criteria based on air monitoring needs such as emergency response, D&D operations, waste management operations, and on-site air quality surveillance

ECAM component review, including the design of inlets for ambient conditions, CAM sampling head design, filter selection for long-term operation, on-board MCA with alpha spectrum data processing for background correction and alarm logic, meteorological data collection, and GPS

ECAM data communication from remotely located ECAMs to a base station, including application of the new RadNet protocol, spread-spectrum radio based LANs, antenna selection, and range concerns

ECAM-HOTSPOT meteorological/radiological/geo-reference data processing, modeling, and forecasting for assessment and downwind worker and asset protection

ECAM environmental enclosure design, motor-generator power supply, transport packaging, and tripod setup

Case studies of selected field trials and applications of ECAM air monitoring, including field trials at Tonopah Test Range, on-site monitoring at Los Alamos and planned ARG response support

The discussion will be based on the alpha-ECAM design developed at Los Alamos National Lab and being manufactured by Aquila Technologies Group of Canberra Industries.

3-I Particle Size and Pulmonary Hazard. H. Cember; Purdue University

Particle size is the single most important factor that influences the inhalation hazard from any given aerosol. This PEP course will deal with particle size distributions, transport of airborne particles, the structure and function of the respiratory system, pulmonary deposition and clearance of inhaled particles, and the mean lung dose based on the three compartment lung model on which the current 10 CFR 20 inhalation safety standards are based.

3-J Conducting a Comprehensive Laser Safety Evaluation in the Research University Setting. B. Edwards; Duke University

Entering an accomplished research scientist's laboratory to conduct a laser safety audit can present an overwhelmingly complex and intimidating task. Adopting a methodical approach ensures that every aspect of the lab's

laser safety program receives a thorough review, in a manner that conveys professionalism and establishes credibility. Employing a standardized evaluation process also improves consistency, reducing the probability that a deficiency noted in one lab gets overlooked in the audit of the adjacent lab. Finally, a systematic approach to laser hazard analysis offers the most effective and efficient means to identify, and thereby create the opportunity to correct, potentially unsafe working environments.

This course provides a step-by-step approach for conducting a rigorous hazard evaluation of a research university laboratory containing class 3b and 4 lasers. This method provides a concise distillation of the requirements in the ANSI Z136.1-2000 and ANSI Z136.5-2000 standards for the safe use of lasers. Course attendees will learn a flexible yet rigorous procedure to efficiently prepare for, conduct, and document a useful, professional laser safety hazard evaluation. This method can expand to accommodate an arbitrary number of lasers and adapt to a wide range of experimental set ups.

While some knowledge of laser hazards will be helpful, both experienced and novice health physicists with laser safety responsibilities will benefit from this course. Although basic laser hazard calculations are outside of this course's scope, participants should bring a scientific calculator to allow a "walk through" of example pre-worked hazard calculations. Students will also find their own copy of ANSI Z136.1-2000 a helpful reference.

Monday, June 17 - 12:15-2:15 PM

M-1 Is Radiation an Essential Trace Energy? J.R. Cameron; University of Wisconsin

During the last century dietitians found numerous essential trace minerals and vitamins which were necessary for good health. UV-B in sun light was found to produce Vitamin D in the skin and can be considered the first essential trace energy. The talk will suggest a study to determine if the health benefits of low dose rate radiation are sufficient to classify it as an essential trace energy because of its stimulation of the immune system. When there are arguments in science, as in the case of health effects at low dose rates, it indicates a lack of good data. This talk will not provide proof about health effects of low dose rate radiation. It will present the hypothesis that low to moderate dose rates stimulate the immune system. Data from several large epidemiological studies of radiation workers which support this hypothesis will be presented. They will show significantly reduced deaths of radiation workers from all causes, which is consistent with the hypothesis. The data do not prove the hypothesis. More data is needed. A 1998 study of three Gulf States Vs. three U.S. Mountain States showed that the mountain states have three times the background of the Gulf States. However, the cancer death rate in the Gulf States is 25% greater than in the mountain states. This suggests that people in the Gulf States are suffering from radiation deficiency. I will argue that it is ethical to consider a double blind human study of increased background to senior citizens in the U.S. Gulf States with the aim to determine the health effects of increased background with emphasis on longev-

ity. The talk will close with two methods to reduce radiation phobia. The talk will describe the BERT method to reduce radiation phobia by explaining radiation dose to all x-ray patients in terms of the time to get the same dose from background radiation. I will describe an educational program on the Internet—a Virtual Radiation Museum (VRM) which will improve understanding of radiation.

M-2 Coronary Artery Radiation Therapy [CART]. P. Vernig; Department Veterans Affairs Med Center

Approximately 80 percent of coronary arteries receiving angioplasty treatment to widen the openings narrowed by cholesterol build up will renarrow unless a stent is used. Use of a stent, which is a mesh tube, which is inserted in the artery to hold it open, cuts the restenosis or renarrowing to about 40%. The use of coronary artery radiation therapy in the form of irradiation by sealed source or brachytherapy decreases the re-narrowing or restenosis rate to about 20%. In November of 2000, two devices were approved by the FDA for treatment of “in-stent” restenosis. One was the Cordis, Checkmate(TM) system employing Ir-192 sources and the other was the Novoste, Beta Cath(TM) system using strontium/yttrium-90 sources. In November of 2001 the FDA approved a third device, the Guidant, Galileo(TM) system employing a phosphorous-32 loaded wire driven by a “low dose rate afterloader”. Two other devices may potentially be approved, a radioactive stent using P-32 and a radioactive angioplasty balloon also using P-32. In the summer of 2001 University [of Colorado] Hospital began using a Novoste Beta Cath device and in July the Denver VA Medical Center began the process to become licensed to use the same device, initially intending to execute a sharing agreement with University Hospital. In October VAMC, Denver did its first CART case. This talk will discuss the process, the different devices, focusing on those that are approved for use, licensing and radiation safety issues related to CART, also called intravascular brachytherapy or IVB.

M-3 ICRP 66 Respiratory Tract Model. H. Cember; Purdue University

The ICRP 30 three compartment model of the human respiratory tract was the basis for the 1977 ICRP recommendations for safety standards for inhaled radioactive aerosols on which the current NRC limits in 10 CFR 20 are based. This model was designed for calculating only the average dose from inhaled aerosols to blood-filled lungs of an adult reference person. Since then advances in knowledge of the respiratory system’s structure and physiology, the kinetics of deposition and clearance of particles, and the relative radiation sensitivity of the different tissues and cell lines in the respiratory tract led to the development of a more comprehensive physiologically-based pharmacokinetics (PBPK) model.

The new ICRP 66 model consists of three sub-models: One for deposition of particles and gases, one for clearance from the respiratory tract, and a third one for radiation dosimetry. The deposition model describes the fractional deposition of inhaled aerosols in each of five anatomical compartments of the respiratory tract. The ICP 30 three compartment model deals only with inhaled aerosols. The new

five-compartment model deals with aerosols and also with the deposition and absorption of inhaled gases and vapors. The clearance sub-model describes the kinetics of removal and redistribution of the deposited particles; and the dosimetry sub-model allows the evaluation of radiation doses to each of six different target tissues that may be at risk from inhaled radioactivity. The details of the five-compartment model and its sub-models will be presented.

M-4 Public and Scholarly Perceptions of Radiation Risks. O. Raabe; University of California, Davis

International recommendations, radiation protection standards, national and international policy, and radiation safety practice are all affected by both public and scholarly perceptions of the potential risks associated with human exposure to ionizing radiation. These perceptions have far-reaching impact on societal advances or impediments. This PEP lecture is a collage of the elements that compose the fabric of these perceptions concerning ionizing radiation. Among the public perceptions overlay the images presented by the media, the antinuclear activists, environmental groups, the presumed experts, the nuclear industry, and political candidates, and elected officials. Among the scholarly perceptions are the contrasting views concerning the shape or lack of shape of the dose response curve, the meaning of the linear no-threshold theory (LNT), the reality or lack of meaningfulness of beneficial radiation effects or hormesis, the underlying models of radiation carcinogenesis and genetic alterations. All of these issues will be laid out and systematically discussed. Ultimately the direction of many important societal options such as the use of nuclear power, food irradiation, scientific research goals, and expenditures of portions of our wealth for environmental restoration, that may significantly affect human welfare in the 21st Century, will depend on the course taken by public and scholarly perceptions of radiation risks.

M-5 Role of the Health Physicist in Radiation Accident Management. R. Toohey, REAC/TS; Oak Ridge Associated Universities

As an emergency response asset of the Department of Energy, the Radiation Emergency Assistance Center/Training Site (REAC/TS) is charged with providing support, advice, and training on the medical management of radiation accident victims. When a radiation accident occurs, close coordination is required between medical and health physics personnel; however, unless extraction of a victim from a very high radiation field is required, medical care always takes priority over radiological considerations. Health physicists must be familiar not only with the application of radiation protection principles to accident management, but also with medical terminology and procedures, and both on-scene and in-hospital emergency medical care. Challenges include interaction with medical personnel, dose assessment, public information, and post-accident interactions with managers and investigators, and possibly attorneys. Medical personnel must be taught basic radiological terminology, the difference between irradiation and contamination, radiological triage, contamination control procedures during evacuation and treatment, methods for patient decontamination,

possible therapies (e.g., administration of DTPA), waste management, and preservation of evidence. Dose estimation includes radionuclide identification; intake estimation; deep, shallow and lens dose measurement or estimation; accident reconstruction; and use of opportunistic dosimeters and/or biological dosimetry. Public information concerns include patient privacy, release of facts vs. assumptions, determinations of the effectiveness of plans and procedures, and transmitting technical information to a lay audience. Post-accident interactions include refinements or revisions of dose estimates, stochastic risk estimates, review of operations, review of emergency plans and procedures, and development of lessons learned, as well as potential involvement in litigation. Some actual experiences in radiation accident management will be used to illustrate these points.

M-6 Technical Basis for an Internal Dose Program. J. Alvarez; Auxier & Associates, Inc.

The technical basis for an internal dosimetry program requires knowledge of the workplace contaminants and the potential intake for the contaminants. Potential for intake requires analysis of the workplace, the work performed, and the chemical and physical form of the contaminants. Workplace monitoring and engineered controls may greatly reduce the potential for intake. Nevertheless, bioassay may be to verify the performance of the monitoring or controls. The ability of bioassay to serve as a test for monitoring or controls is limited by the detection limits possible. Detection limits also restrict the ability to assign dose, therefore, detection limits are a major factor in developing a technical basis for an internal dose program.

Signal detection by counting events has well-established methods that are widely practice. The usual convention of working near the detection limit results in important uncertainties that may not be included or appreciated in bioassay or other low-level counting. There have been recent attempts to account for the uncertainties using Bayesian methods. The approached used here is to perform the exact calculation using Poisson statistics and to present an alternate method for detection limits and propagating uncertainty.

The exact calculation may not be amenable to most situations because samples are sent to a laboratory whose statistical methods are beyond the investigator's control. An alternate method to the exact calculation is to examine the distribution of results from the laboratory by fitting two or more distributions to the data and obtain a practical if not exact detection limit.

Tuesday, June 18 - 12:15-2:15 PM

T-1 Revisions in Internal Radiation Dosimetry; ICRP Publication 68. D. Bernhardt; Salt Lake City, Utah

The International Commission on Radiological Protection (ICRP) has published updated dosimetry models and parameters, for internal dosimetry, in ICRP Publication 68 and related publications. This dosimetry system has been applied by the International Atomic Energy Agency and many countries, and there has been limited implementation in the U.S. Current radiation protection standards in 10 CFR 20 and Federal Guidance Reports 10 and 11 are based on the dosimetry of ICRP Publication 30, and related publications.

ICRP 68 provides updated dosimetry for radiation workers and the general public, including age specific models and parameters. The revisions since ICRP 30 are primarily due to the new ICRP respiratory model, updated biokinetic models, and specific models for the general population, including specific age groups. Revised models for dose assessments from bioassay data are also given. The Nuclear Regulatory Commission (NRC) and at least one Agreement State have granted license amendments to allow use of ICRP 68 dosimetry.

Application of the models requires a cohesive implementation of the ICRP 68 concepts. The PEP will provide an overview of the models related to ICRP 68, differences from the previous models, and comparison of the parameters for the different models. The use of the ICRP Dosimetry CD will be shown and examples of calculations of dose parameters and bioassay calculations will be provided.

T-2 Medical Management of Patients Vis-a-Vis Radiological Terrorist Events. V.K. Lanka; UMDNJ - Newark Campus

This PEP course will mainly focus on the radiological and safety issues relevant to the threat of radiological terrorist activities. This course provides information on the medical management of patients with radiological injuries associated with the dispersal of radioactive materials. Additionally, this course is designed to provide basic principles of effective planning and response to terrorist activities associated with the dispersal of radioactive materials. Health effects associated with the "dirty bombs" and guidelines for internal and external exposure, as well as decontamination and cleanup will be discussed. An overview of the containment of the contamination to the treatment area and prevention of contamination of other personnel will be presented. This course will provide the essential elements necessary to train medical personnel regarding the priorities and how to identify and assess different types of radiation injuries. The role of health physicist during the emergency response to the "dirty bomb" will be discussed.

T-3 Steering a Course Through the Regulatory Maze. R. McBurney; Texas Department of Health

This course will describe the current federal and state regulatory framework for sources of ionizing and non-ionizing radiation (who does what). Areas of overlap and "gray areas" of state and federal jurisdiction will also be included. The course will also cover licensing issues for several types of radioactive material use, such as medical diagnostic and therapeutic uses, broad scope use, and industrial applications. Technical and financial requirements and lists of guidance materials available to assist in preparing license applications will be provided and discussed. Hands-on exercises and examples of license conditions and procedures for license applications, certain amendments, and decommissioning plans for site termination will be presented.

T-4 The Art and Science of “Selling” Your Radiation Safety Program. R. Emery; University of Texas at Houston

Ask any experienced practicing radiation safety professional and they will likely tell you that the ultimate success or failure of any program is contingent upon the ability to effectively “sell” its attributes. Radiation safety professionals are constantly trying to persuade, induce, convince, affect, impress, convert, discourage, or prompt actions. We must be able to “sell” ourselves to gain employment, start new initiatives, or successfully interact with regulatory agencies. Although salesmanship is an essential skill for the profession, training in this area is not normally included in our academic or continuing education curricula. To cultivate an awareness of the importance of sales and marketing skills in our profession, this presentation will serve to answer some very basic, but essential questions, such as: what are we “selling”, who are we “selling” to, and how do we go about “selling” effectively.

T-5 Use of MARSSIM for Decommissioning Medical Facilities. E. Abelquist; Oak Ridge Institute for Science and Education

The Multi Agency Radiation Survey and Site Investigation Manual (MARSSIM), published in December 1997, has been used to design final status surveys at a number of sites, including uranium and thorium sites, power reactor facilities, and research laboratories. The implementation of MARSSIM at each of these facilities is somewhat different depending on the radionuclides involved and the types of media that are potentially contaminated. For example, the Sign test for alpha and beta surface activity measurements, via the unity rule, might be the MARSSIM survey design at a sealed source production facility. Similarly, a site contaminated with depleted uranium might use the WRS test for contaminated land areas. This course will discuss the implementation of the MARSSIM methodology at university and medical research laboratories.

The expected radionuclides at research facilities include H-3, C-14, I-125, P-32 and a number of other short-lived radionuclides used primarily for tracer studies. Final status surveys should focus on the areas likely to be contaminated, such as bench tops, fume hoods, floors and sinks. The MARSSIM survey design discussion will include the application of derived concentration guideline levels (DCGLs), selection of survey instrumentation, classification of laboratory areas, and statistical design for the number and location of surface activity measurements, for both direct measurements and smears. The COMPASS code (MARSSIM software) will be used to design an example final status survey for a research facility, and the Data Quality Assessment process will be applied to hypothetical data set.

T-6 Effective Communication Tools for Improved Radiation Safety Programs. R. Johnson; CSI - Radiation Safety Academy

While most HPs and RSOs are well prepared to deal with technical issues for implementing a successful radiation safety program, many are not well prepared for communication or people issues. Few are trained to deal with issues involving feelings, such as an upset worker, an overly

alarmed worker, or an overly complacent worker. How many know how to deal with anger in the workplace or resistance to safety program requirements? How do you motivate safety program performance and ALARA, with the carrot or the stick? What do you do when a worker refuses to implement radiation safety requirements? How do you deal with the images that workers may have about the consequences of exposure to radiation? How do you deal with grievances or union issues? What about a worker who files a complaint with the regulatory authorities and threatens legal actions? How do you respond to members of the public who believe that your facility is causing unacceptable radiation exposures? How do you answer questions from the news media?

HPS and RSOs are successful because of the many tools they can apply to solving problems. But, what tools do you have to apply to communication and people issues that are often the greatest day-to-day challenge. We will review a number of tools available from the fields of psychology, behavioral, and communication sciences for practical help in dealing with some of the questions outlined above. Many of these tools have been presented in monthly columns in the HPS Newsletter “Insights in Communication” from 1994 to 2001. This will be an opportunity for dialogue and discussion about how to apply communication tools for improving your radiation safety program.

Wednesday, June 19 - 12:15-2:15 PM

W-1 How to Have Fun Teaching Kids and Adults about Radiation. C. Owen, K. Shingleton; Lawrence Livermore National Laboratory

Teaching children and adults about radiation is both fun and challenging. This course demonstrates two different 1-hour presentations (with demonstrations and experiments) suitable for all ages. Come get ideas and handouts you can use for enjoyable presentations to schools, science fairs, career days, or other public education forums. These presentations have been well tested and received by a wide variety of audiences. Learn how to make this topic fun for both you and your audience

W-2 Obtaining Optimal Image Quality and Minimal Patient Dose in X-ray Imaging. D. Howe; University of South Carolina

As X-ray image quality is improved the patient dose will increase. From chest X-rays to mammography, the need for increased contrast and detail to detect subtler and smaller lesions without sacrificing optimal density is achieved with techniques that increase the number of X-rays absorbed in tissue. This PEP will discuss the effect on tissue dose and image quality of 1) one’s choice of image receptor, 2) choice of X-ray tube voltage, current and time, 3) choice of anode material, 4) choice of filter material, 5) and the body part being imaged. Traditional plain film and digital imaging receptors will be discussed and compared with regard to their influence on tissue doses. The image quality resulting from a specific technique choice will also be explained in terms of the interaction of photons in this energy range with biological material.

W-3 Introduction to Non-Ionizing Radiation Safety: Practical Strategies. J. Greco; Eastman Kodak Company

Health Physicists are increasingly requested to assess the potential hazards of non-ionizing radiation sources, and provide control strategies that are effective as well as meet requirements of applicable exposure guidelines. To accomplish this, the assessor should have a basic knowledge of proper measurement techniques and the various exposure guidelines. In this introductory PEP, an overview will be provided which addresses common sources of NIR [ultraviolet, radiofrequency/microwave, power frequency (60 Hz) and static magnetic fields], biological effects, instrumentation, exposure guidelines, and control strategies. In addition, special circumstances will be discussed, such as magnetic field effects on implanted medical devices, and ozone production from UV sources. A listing of references and useful websites will also be provided. (Please note that lasers will not be addressed during this PEP session.)

W-4 A Risk Management & Insurance Primer for Institutional Health Physicists. R. Emery; University of Texas at Houston

In recent years, many institutional radiation safety programs have been involved in organizational re-alignments, shifting from stand-alone units to assimilation into comprehensive environmental health and safety programs. Such shifts compelled health physicists to expand their professional knowledge base to better understand the roles of their new organizational colleagues. But the trend of institutional transformation has not stopped. A current phenomenon is the creation of comprehensive institutional risk management programs, which incorporate all health and safety functions, along with other institutional loss control and insurance activities. In recognition of this trend, it is imperative that practicing health physicists become familiar with the risk management and insurance profession to ensure that issues are effectively communicated within the context of this new paradigm. This course will provide an overview of the risk management and insurance profession, specifically addressing (1) how an organization's loss exposures are identified and analyzed, (2) how risk management alternatives are evaluated, (3) how the most desirable option is selected, (4) the implementation of selected risk management techniques and (5) the monitoring of effectiveness. Suggested strategies for adapting radiation safety programs to the risk management organizational environment will be

W-5 University Medical Center Radiation Safety Programs. D. Derenzo; University of Illinois at Chicago

Universities with large medical centers and medical schools present a challenging environment for radiation safety professionals. This session will review the important aspects of effective radiation safety programs for broad scope medical research licensees. Topics will include licensing, committees, dosimetry programs, radiation safety during radiation therapy procedures, project authorizations and reviews, radiation safety in biomedical research laboratories, radioactive material accountability, inspection of medical and non-medical radiation producing equipment, instrument calibrations, radiation surveys, sealed source leak testing, waste management, training, and more. This course

should be helpful to anyone involved with a university or hospital radiation safety program regardless of the size or scope of program.

W-6 Calculating and Reporting Fetal Radiation Exposure from Medical Procedures. A. Karam; University of Rochester

On occasion, pregnant women receive diagnostic medical procedures using radiation or radioactivity. This may occur because they are unconscious from trauma and are not visibly pregnant or because they discover their pregnancy after the procedures. In such cases, medical health physicists should be called upon to calculate a fetal radiation dose and to report this to the woman's physicians. However, dose information alone is not sufficient because many physicians are not familiar with the fetal effects of ionizing radiation. It is essential to present supporting information to the woman's obstetrician so both doctor and patient can make a reasonable decision based on facts and not on fears. It is also important to remember that, as health physicists, we cannot make medical recommendations; we can only calculate the dose and provide references to the medical literature.

This PEP will discuss some standard methodologies for calculating fetal radiation exposure, the current medical guidelines based on the exposure and gestational age, and how this information can be presented. In addition, some legal aspects of these reports will be discussed.

Thursday, June 20 - 12:15-2:15 PM

TH-1 Radiation Safety in Brachytherapy. J. O'Rear; GammaWest Brachytherapy, Salt Lake City, Utah

This course will be designed to familiarize attendees with the various radiation safety issues surrounding the clinical practice of brachytherapy. The primary emphasis will be on High Dose Rate Remote Afterloading with other techniques being covered as time permits. A review of the regulatory requirements related to brachytherapy including U.S. NRC Regulatory Guidance, 10 CFR Parts 19, 20 and 35. The new NRC Reg. Guide 1556, Vol. 9 will be addressed and new requirements relative to the previous Policy and Guidance Directives FC86-4, Rev. 1, and 83-20, Rev. 2 will be outlined. In addition to regulatory guidance and requirements, current recommendations and professional standards of good practice will be covered.

Course material will include the most common applications of HDR brachytherapy such as treatment of prostate cancer, breast cancer, head and neck cancer sites and gynecological treatments. Radiation safety concerns will be addressed for various treatment regimens including exposures to staff performing the procedures, nurses and other ancillary hospital staff.

TH-2 Back to Nature: The Sources and Origins of NORM. A. Karam; University of Rochester

We all know that NORM stands for Naturally Occurring Radioactive Materials. What is not as well-known is where in nature NORM originates. Some mineral deposits are enriched in NORM while others are not, and processing NORM-enriched rocks and minerals can lead to subsequent regulatory concerns.

This PEP will review the sources of NORM in the environment, paying special attention to those sources that are commercially important or that have the potential to affect radiation dose to the population.

TH-3 Medical Internal Dose Calculations - Current Practice and Future Trends. *M. Stabin; Vanderbilt University*

The recent emphasis on the use of nuclear medicine therapy agents against many forms of cancer has brought about an increase in the need for reliable and clinically meaningful internal dose calculations. Traditional mathematical model-based internal dose calculations, as developed by the Medical Internal Radiation Dose (MIRD) Committee of the Society of Nuclear Medicine, are still in widespread use, for diagnostic and therapeutic agents, but strong trends are developing toward more patient-specific dose calculations. Adjustments to traditional dose calculations based on patient measurements are routinely made in therapy trials, including marrow activity (based on measured blood parameters), and organ mass (based on volumes measured by ultrasound or Computed Tomography (CT)). A more revolutionary approach, using truly patient-specific models developed from patient image data, fusing CT or Magnetic Resonance data (to describe patient anatomy) with Positron Emission Tomography or Single Photon Emission Computed Tomography data (to describe the spatial distribution of the radioactive tracer and its biokinetic behavior). More data and resources are becoming available through the internet, and the power and speed of available tools is increasing rapidly. This program will give an overview of current tools and common practice in internal dose assessment in nuclear medicine, describing both diagnostic and therapeutic applications, but with an emphasis on the latter.

TH-4 Subsurface Radiological Characterization. *J. Alvarez; Auxier & Associates, Inc.*

The investigation of subsurface radiological contamination whether for characterization, control, or site closure requires methods similar to but not included in MARSSIM. The MARSSIM model is a good place to start for subsurface surveys and investigations, but the planning, modeling, measurements, and statistical tests differ. The differences can be substantial. This course will provide:

- An overview of the Subsurface Radiological Survey and Investigation Process
- A MARSSIM-like structure for planning preliminary investigations and development of a basis for compliance
- An introduction to subsurface modeling
- Survey planning and design based on subsurface modeling
- Calibration and selection of measurement techniques
- Statistical methods for evaluating the contaminated volume against models of subsurface contamination

TH-5 Obtaining Optimal Myocardial Perfusion Images with

Minimal Patient Dose. *D. Howe; University of South Carolina*

Today, myocardial imaging is one of the most common nuclear medicine procedures. Image production must obtain a minimum image quality that enables the physician to make a well-informed decision on the course of treatment. This PEP discusses those factors that effect image quality and their influence on the dose that the patient receives from the procedure. Some of these factors have subtle effects on dose, others have significant effects. Non-camera factors include the selection of the radionuclide (201-Tl, 99m-Tc, 18-F) and the associated pharmaceutical (TlCl, sestamibi, tetrofosmin, deoxy glucose). Camera factors include geometric spatial resolution (collimator choice), intrinsic spatial resolution (crystal selection and thickness; photomultiplier tube efficiency, number, and uniformity; light to voltage pulse conversion; X-Y location circuitry; matrix size), scatter resolution (pulse height analyzer setting, source to camera distance), intrinsic energy resolution, and patient attenuation. The relation between object contrast and spatial resolution and between spatial resolution and sensitivity will also be discussed in the context of patient dose.

TH-6 Patient Radiation Safety and Fluoroscopy. *C. Plott; Forsyth Medical Center and University of North Carolina at Chapel Hill*

X-ray guided interventional procedures, often performed instead of invasive surgeries, can result in high patient skin dose. Although the incidence of serious radiation injury is small compared to the number of procedures completed annually, physicians who perform these interventions should be well trained in radiation safety. Furthermore, for continuous quality improvement, a patient ALARA program that includes monitoring of fluoroscopy times and doses should be implemented.

The United States Food and Drug Administration (FDA) first issued public health advisories in September 1994 regarding procedures involving prolonged fluoroscopy times and the resultant radiation-induced skin injuries. More recently in May 2001, the Conference of Radiation Control Program Directors (CRCPD) issued a resolution regarding its commitment to the prevention of unnecessary radiation exposure to patients from fluoroscopy; CRCPD is cooperating with the FDA and the Joint Commission on Accreditation of Healthcare Organizations (JCAHO) to implement at healthcare facilities recommendations related to physician training, communication of risk to patients, and monitoring patient doses.

This course will provide information needed to establish and implement a patient ALARA program. Topics will include potential biological effects of skin exposure, a description of various interventional procedures, and guidelines/standards from organizations such as the CRCPD, FDA, JCAHO, the American College of Radiology, and the Society of Cardiovascular and Interventional Radiology. Suggestions will be made for program content, including physician training to operate x-ray equipment, patient education (general information, consent, and post-procedure follow-up), physician information and feedback, and Radiation Safety Committee oversight. Sample data from an existing ALARA program will be shared.

Continuing Education Lectures

Included with Registration

Each course is worth 2 CECs

Monday, June 17 - 7:15-8:15 AM

CEL-1 Backgrounds, Detection Limits, and Treatment of Uncertainties in Survey Data. J. Shonka; Shonka Research Associates, Inc.

This lecture will review the basic statistical elements of radiation detection and data analysis. It will provide users with the means to evaluate and treat the data from surveys and to assess the technical adequacy of a survey program. These methods, not in common use, include the establishment of the inherent background in any survey unit without the direct need for comparison to reference areas, and an efficient sorting method that can provide direct evidence for the presence (or absence) of contamination, permitting consideration of additional confirmatory measurements. Methods to control and limit the uncertainties of radiation measurements using commonly available instrumentation will be discussed.

The MARSSIM tests are relatively insensitive for the detection of small quantities of localized radiation, as their emphasis is on comparisons of differences. MARSSIM stresses the need for scan surveys to assure that localized sources of contamination are identified and considered. More sensitive tests can be performed using simple graphical techniques. These tests will be demonstrated using real survey data. The course will show that a properly performed survey is an element of an overall program of contamination control that exploits a defense in depth approach that includes taking credit for the multiple surveys normally performed in the course of routine operations or decommissioning.

Actual survey data will be used as examples to show how to alter the survey practices to minimize the uncertainties that occur. In addition, a posteriori methods of analysis to account for any remaining uncertainties and to explicitly take credit for multiple surveys will be described.

CEL-2 The Oklo Natural Nuclear Reactor. A. Karam; University of Rochester

About 2 billion years ago, a uranium-rich sandstone formation in what is now the African nation of Gabon changed from uranium ore to an operating nuclear reactor. Although there has been some speculation about other natural reactors, Oklo remains unique in science. In this CEL, we will look at the conditions that led to Oklo - the geological and geochemical conditions that allowed a critical configuration to form, and how the configuration of the several reactor zones compares to that of a modern nuclear reactor. Finally, we'll look at what we can learn from Oklo that might apply to radioactive waste disposal, and whether or not Oklo was really likely to have been unique in the history of the Earth.

Tuesday, June 18 - 7:15-8:15 AM

CEL-3 Radiation Protection Quantities: A Critique. J.R. Cameron; University of Wisconsin

The inspiration for this talk is Harald H. Rossi's statement in the March 1996 Health Physics "During the last two decades the concepts of radiation protection and the applicable physical quantities have drifted into what must be regarded as chaos." The talk will review the evolution of radiation protection quantities and discuss their advantages and disadvantages.

The talk will discuss the following topics:

1. Is it scientifically possible to define radiation protection quantities that are quantitatively related to health risks?
2. While physics aspects are usually straight forward, the biological aspects are not.
3. Radiation protection quantities primarily serve a bureaucratic purpose rather than a medical purpose.
4. A possible scientific quantity to replace effective dose is imparted energy.
5. Victor Bond related imparted energy to radiation induced cancer of the a-bomb survivors.
6. Do we need a radiation protection quantity the public can understand?

CEL-4 Radiation Accident History. R. Toohey; REAC/TS, Oak Ridge Associated Universities

The Radiation Emergency Assistance Center/Training Site (REAC/TS) maintains a registry of serious radiation accidents that have occurred worldwide since 1944. The criteria for an accident to be included in the registry include a whole-body dose exceeding 250 mSv or a local dose exceeding 6 Gy to one or more individuals; i.e., doses that would require medical intervention. As of December 2001, 421 accidents are included in the registry, resulting in 3,044 significant exposures with 134 fatalities. Of these accidents, 20 have involved critical assemblies, 313 have involved radiation-generating devices (including sealed sources), and 88 have involved uncontained radionuclides. In the United States, there have been 30 fatalities associated with radiation accidents, 21 of which involved the medical applications of radiation. In practically every case, human error of one sort or another has been the primary or contributing cause of the accident. The effects of radiation accidents may be divided into the general categories of medical, psychological, environmental, economic, and of course, legal consequences. It is important to remember, however, that irradiation or contamination by itself is not immediately life threatening; therefore, emergency medical treatment for trauma or other conditions takes priority over decontamination of radiation accident victims.

CEL-5 Updated Internal Radiation Dosimetry; ICRP Publication 68. D. Bernhardt; Salt Lake City, Utah

Current radiation protection standards in 10 CFR 20 are based on the dosimetry from International Commission on Radiological Protection (ICRP) Publication 30 for radiation workers. Revised dosimetry for radiation workers and the general public is published in ICRP Publication 68 and related publications. The revisions since ICRP Publication 30 are primarily due to the new ICRP respiratory model and updated biokinetic models, and specific models for the general population. Revised models for dose assessments from bioassay data are also given. The Nuclear Regulatory Commission (NRC) and at least one Agreement State have granted license amendments to allow use of ICRP 68 dosimetry.

Application of the models requires a cohesive implementation of the ICRP 68 concepts. The CEL will provide an overview of the models related to ICRP 68, differences from the previous models, and comparison of the dosimetry parameters for the different models.

CEL-6 Depleted Uranium, Why Public Concern Is So Great? E.G. Daxon; U.S. Army Medical Department

The issue of the use of depleted uranium (DU) in military munitions has highlighted, more than any other issue, that science is not enough to allow the development of sound health and environmental quality decisions. In many respects, science, our culture and our language, actually hinders the development of these policies. DU is a good example because the science is so well established and the conclusions are so clear yet the controversy continues and will probably continue to continue. The purpose of this talk is to focus on how the practice of scientific investigation and the translation of these investigations into policy decisions contributed to this controversy for depleted uranium.

CEL-7 Basics of PET. J. Jacobus; National Institutes of Health

As an imaging modality, positron emission tomography (PET) is gaining an increasing foothold in nuclear medicine and the public's attention. While PET shares some common characteristics with nuclear medicine, it has a number of attributes that make it superior, along with some disadvantages. An overview of equipment design, radionuclide production, biological uptake mechanisms, and image construction will be examined.

CEL-8 Current Status of Agents used in Nuclear Medicine Therapy. M. Stabin; Vanderbilt University

Nuclear medicine therapy is used increasingly in the treatment of cancer, including thyroid cancer, leukemia and lymphoma with radioimmunotherapy (RIT), primary and secondary bone malignancies, and neuroblastomas. The use of internal emitters, specifically targeted to diseased tissues, is resulting in significant benefits in the treatment of many of these neoplasms. Both electron and alpha emitters are being used in a variety of new approaches to the fight against cancer, and positive responses have been recorded in many patient populations, resulting in the commercial development of new approved agents and techniques. The highest rates of success of course are with traditional ¹³¹I NaI therapy against hyperthyroidism and thyroid cancer, but significant gains are being seen in the treatment of bone and marrow cancers, and some novel targeting strategies and radionuclides are being proposed for other cancers. The use of high LET emitters, including alpha and Auger electron emitters, is also on the increase in newly proposed regimens. A general overview of a number of these promising technologies and some results will be given, with emphasis on the radiation dose calculations needed to ensure their safe use.

2002 Exhibitors

ADCO SERVICES, INC. *Booth: 414*
Adco Services, Inc. handles the brokering for processing and disposal of radioactive, hazardous, and non-hazardous wastes.

AEA TECHNOLOGY QSA, INC. *Booth: 219*
Formerly trading as Amersham Corporation, AEA Technology QSA, Inc. offers a complete range of Isotrak reference sources and solutions for instrument calibration and environmental monitoring. Isotrak introduces the new DoseGUARD Plus personal electronimeter which responds to beta radiation, gammas from as low as 15keV.

AMERICAN NUCLEAR SOCIETY *Booths: 619, 621*
The American Nuclear Society publishes Nuclear News, Radwaste Solutions, technical journals, standards and position statements. Its 11,000 members represent to the government and the public a unified voice in support of nuclear science and technology.

BARTLETT NUCLEAR, INC. *Booths: 103, 105*
Health Physics, decontamination and decommissioning staff augmentation, decontamination, ventilation, remote monitoring equipment and final site survey monitors.

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Equipment for high resolution in situ gamma spectroscopy laboratory alpha and gamma spectroscopy, low background alpha beta systems, air monitors, and HP management software.

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Radioactive waste management, waste characterization; sealed sources disposal/recycle; contaminated scrap, soil, trash disposal; mixed waste treatment/disposal; radioactive remediation.

F&J SPECIALTY PRODUCTS, INC. *Booths: 503, 505*
ISO 9001 manufacturer of air sampling systems, air-flow calibrators, radioiodine collection cartridges, filter holders and radon detection products. ces include calibration of air monitors and repairs to calibrators and air samples. F & J welcomes requests for custom projects.

FRHAM SAFETY PRODUCTS INC. *Booth: 107*
Founded on customer service, Frham Safety Products Inc. is a leading supplier of Nuclear and Industrial safety equipment throughout North America. Serving both commercial and governmental facilities, Frham offers innovative radiation and contamination protection, HP supplies, rad-waste reduction items and custom manufacturing.

GAMMA PRODUCTS INC. *Booth 504*
G520 Desktop or Traveler a/b counting system.

GEORGIA INSTITUTE OF TECHNOLOGY *Booth: 214*
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HI-Q ENVIRONMENTAL PRODUCTS CO. *Booth: 415*
Hi-Q is a leading manufacturer of Air Sampling Equipment, Systems and Accessories. Hi-Q's product line includes: High & low volume air samplers, air flow calibrators and calibration services, radioiodine sampling cartridges, filter paper, filter holders and complete stack sampling systems.

ICN DOSIMETRY SERVICE *Booths: 213, 215, 312, 314*
ICN Dosimetry Service offers a full range of services for radiation monitoring, primarily through film, thermoluminescent, and track edge badges. ICN has more than 45,000 customers worldwide.

ISOTOPE PRODUCTS LABORATORIES *Booths: 410, 412*
Isotope Products Laboratories is a NIST traceable laboratory supplying radioactive standards, sources and nuclides for counting room use, instrument calibration and environmental monitoring, specializing in custom requirements.

LABORATORY IMPEX SYSTEMS LTD. *Booth: 513*
Installed and portable radiation monitoring systems - gamma, alpha/beta aerosol, iodine, noble gases, etc. Static air sampling, lung dosimetry, lab counting systems.

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Landauer is the nation's leading provider of personnel radiation dosimetry services. New OSL technology, Luxel (R) dosimeter, measures x-ray, beta and gamma radiation along with neutron detection capabilities. NVLAP accredited.

LND, INC. *Booth: 210*
World's leading manufacturer of Nuclear Radiation Detectors including, since 1964: GM tubes, BF3 & He3 Neutron Detectors, Ionization chambers, Beryllium window X-Ray proportional counters and more.

LUDLUM MEASUREMENTS, INC. *Booths: 512, 514*
Ludlum Measurements, Inc. will display portable and laboratory instrumentation used in the Health Physics industry.

MGP INSTRUMENTS *Booths: 311, 313*

MGP Instruments designs, develops, markets and supports operational survey equipment and measurement systems in order to protect people, facilities and the environment against technological hazards and threats.

NUCLEAR ENERGY INSTITUTE *Booth: TBD*

NEI will be featuring an exhibit that demonstrates the benefits of nuclear energy as well as a videotape that features the safety of transportation. We will also have computers set up with the capability for attendees to send correspondence to their Congressional Representatives.

OAK RIDGE ASSOCIATED UNIVERSITIES *Booth: 402*

ORAU provides a variety of services in the radiological sciences: Training, environmental surveys, decommissioning, epidemiology, emergency response.

ON SITE SYSTEMS, INC. *Booth: 305*

Developers of the Health Physics Assistant, a unique computer software program designed to help the Radiation Safety Officer efficiently meet federal, state and local requirements for managing the safe use of radioactive materials. The HP Assistant allows for the documentation of your radio nuclide purchasing, receipt, use, waste disposal, real-time inventory, training records, lab surveys and audits, instrument inventory, including calibration records and locations, personnel dosimetry records including histories, as well as general information about your facility and its license.

OVERHOFF TECHNOLOGY CORP. *Booth: 525*

Design and Manufacture of Electronic Instrumentation for Measurement of Radiation.

PERKIN ELMER INSTRUMENTS-ORTEC *Booths: 205, 207, 304, 306*

ORTEC is a global supplier and world leader in the manufacture of nuclear detection instrumentation. ORTEC will exhibit the latest solutions for counting laboratories, NDA and waste assay applications for these applications including the X-Cooler, low cost mechanical cooler, and the DigiDart Portable MCA and pick up a copy of our new catalog which is now available on CD-Rom.

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LLRW and Mixed Waste brokerage services, HP services including decontamination and decommissioning, license terminations or amendments, preparation of survey plans, pre- and post-decontamination surveys.

PRINCETON GAMMA TECH, INC. *Booth: 202*

On display will be a full line of Gamma Spectroscopy Systems, including the system 8000 with Quantum Gold and QCC. PGT also offers a wide range of MCA's and detectors, both silicas and HPGE.

PROTEAN INSTRUMENT CORPORATION *Booth: 307*

Protean Instrument Corp. is the leading supplier of high performance alpha/beta counting systems, and the only company 100% dedicated to the manufacture of these systems. We manufacture a range of 7 basic models, including automatic, manual, single detector, multi-detector, windowed and windowless. We deliver twice the performance!!

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PTI SYSTEMS provides client-server information systems for the energy industry. These include the ARACS*TM* access control system, the ProRad*TM* health physics records management system, our Survey Map Utility and Genesis*TM*, our final site survey management tool. Hands-on demonstrations offered at our booth.

PULCIR, INC. *Booth: 515*

Pulcir presents simulation training instruments from Safe Training Systems. Pulcir is also your Southeastern representative for Ludlum Measurements and other fine manufacturers of HP instruments.

RADIATION SAFETY ACADEMY *Booth: 318*

A leader in radiation safety training since 1983. Monthly classes for RSOs, health physicists, researchers, sealed source and gauge users, radiation workers, DOT, HAZMAT responders. Quarterly classes on D & D, radwaste, advanced RSO, radiation risk communication, train-the-trainer, and risk assessment. Training provided by CHPs, including Ray Johnson, Dr. Alan Fellman, Sean Austin, Steve Keller, and others. Consultation, license applications, and program audits by CHPs and NRRPTs. On-site training to meet your needs.

RSO, INC. *Booth: 614*

Full service Health Physics service and support. Product catalog with a large variety of signs, labels and tapes.

SAIC *Booth: 403*

SAIC's Safety Instruments Operation (SSIO) will display its state-of-the-art dosimeters, dose management systems, personnel monitoring systems and RADSMART—the nuclear materials identification system. All SAIC's SSIO-manufactured products are built in the USA and are backed with over 25 years of expertise.

SAINT-GOBAIN CRYSTALS & DETECTORS, RADIATION MEASUREMENT PRODUCTS *Booths: 519, 521*

Saint-Gobain Crystals & Detectors offers a full line of HP instruments comprising the Bicon, Harshaw TLD, NE & Mini branded products. Covering every need from pancake GMs to networked systems.

SAINT-GOBAIN/CRYSTALS AND DETECTORS, SCINTILLATION PRODUCTS *Booth: 523*
Manufacturer of Geiger-Mueller (GM) tubes, Helium-3 neutron detectors, Pancake GM, and Miniature GM tubes.

SIEMENS ENVIRONMENTAL SYSTEMS *Booths: 427, 526*
Siemens Environmental Systems, designs, manufactures and installs a wide variety of radiation, industrial hygiene and industrial monitoring systems; expertise in dosimetry and telemetry systems.

SMART DATA SOLUTIONS, INC. *Booth: 507*
RS Solutions, a Radiation Safety Database that provides a radiation safety office a powerful tool to store, organize, and view its records and data. RS Solutions can also provide users the ability to access data through the Internet. The software can be customized to fit specific policies.

SPECTRUM TECHNIQUES *Booth: 303*
Exempt quantity radioisotope sources and radiation measuring equipment for HP and nuclear medicine training.

STL RICHLAND *Booth: 510*
STL Richland has over 35 years in experience in radiochemical analysis providing a full range of analysis for radioactive materials in environmental and bioassay matrices, and other biological materials.

SYNCOR (INOVISION RADIATION MEASUREMENTS) *Booths: 411, 413*
Innovation Radiation Measurements (IRM) is the successful alliance of two of the leading suppliers of radiation measurement instrumentation in the world today. Victoreen, Inc. and Keithley Radiation Measurements Division have combined operations to design, manufacture and supply electronic instrumentation for the detection and measurement of ionizing radiation. We will have all of the survey meters and probes along with the electrometers on display. Our new Calibration and repair service brochure will also be available to introduce you to the World Class Calibration Lab that has been built in our new facility and ready to serve all of your calibration needs.

TECHNICAL ASSOCIATES *Booth 502*
Recent additions to TA's Health Physics instrument line include air and area monitors, which are smarter, more sensitive and more rugged than previously available, in addition to pipe and plume and the latest advances in portables.

THERMO EBERLINE *Booths: 327, 426*
Thermo Eberline is the leader in the Design and Manufacture of Radiation Detection Instrumentation.

TLG SERVICES, INC. *Booth: 407*
TLG, a unit of Entergy Nuclear, Inc., provides D&D services including cost estimating, testimony, program planning, final surveys and field management. Successful projects include nuclear & fossil-fueled plants, research facilities, & government projects

UNITECH SERVICES GRP (FORMERLY INS) *Booth: 315*
Worlds leading supplier of laundry decontamination services for protective wear that we sell, lease or rent to Government, Utility, Waste Processors, Fuel Fabricators, D&D Contractors or other industrial users in the nuclear industry.

Instructions For Filling Out The Résumé Form

Lets face it, everyone is looking for a job at one time or another. But during the ARSCE Meeting, the job placement center might not be the best way to advertise your résumé, especially if your supervisor is attending the meeting. Also, not all members can make it to the meeting to post their résumé. Therefore, for those of you interested in seeking employment during the meeting, but not brave enough to post your résumé, this form is for you! You don't even have to be present at the meeting to participate.

Every attendee who is interested in seeking employment (and who doesn't want to take advantage of the prepared résumé form), is encouraged to bring his or her résumé to the Placement Center. **If you are taking advantage of the prepared form, you should not also post your own résumé.**

If you cannot make it to Tampa, you can still send either your résumé form or your personal résumé, and we will post it for you. Your résumé form should indicate that you are not at the meeting, so if a company is interested in you, they will call Micah Sauntry (see contact information below) and he will then contact you. If you are interested in the company, it will be up to you to contact the company. In addition to the résumé form, you can always place an advertisement in the Newsletter under the Health Physicists Seeking Employment section.

On the adjacent page is the 2002 Annual Meeting Résumé Form. Please fill out both sides of the form completely. **Do not enter in a number after it states "Résumé Number;" that will be done by the HPS Secretariat.** Since a photocopy of side one will be posted at the meeting, be sure to either type or write legibly with a dark pen. No spelling or grammatical corrections will be made. Once you have completed both sides of the form (except for entering in a résumé number) please send the form to:

Micah Sauntry
HPS Headquarters
1313 Dolley Madison Blvd., Suite 402
McLean VA, 22101
email: MSauntry@BurkInc.com

These forms must be sent no later than **May 17, 2002**. Once these forms are received, a résumé number will be issued and inserted on side one and two. By May 24, 2002, a résumé number will be assigned to all résumé forms and a photocopy of side two (with the résumé number) will be sent back to you. Please remember what résumé number has been assigned to you. A photocopy of side one will be posted at the meeting. The original résumé form will be kept in a book, strictly confidential, for six months after the meeting and then destroyed.

All completed résumé forms (side one) will be posted at the same time and will be up for the duration of the meeting. If an interested company wants more information, such as a more extensive résumé or an on-site interview, they will write a note on the message board in the placement center room. An example would be: "Résumé Numbers 12, 17 and 56 please leave your résumé at the Hotel front desk to the attention of D. A. Smith, XYZ Company," or "Company QRS would like to interview Résumé Numbers 19 and 23, please call J.D. Jones to set up appointment during meeting."

2002 Annual Meeting Résumé Form

EDUCATION

School:

Degrees and Dates:

(if student, expected graduation date and degree)

JOB DESIRED

Position Desired:

Date Available:

Any Travel or Relocation Limitations:

Citizenship:

Any Active Government Clearances:

JOB DESCRIPTION

Present Job Title:

Describe Present Duties (do not list company):

EXPERIENCE

Briefly describe the various experiences you have had in the health physics field (Do not list company):

RÉSUMÉ # _____

At Meeting? Yes No

All replies to side two of this form will be kept strictly confidential. This side will not be posted at the meeting. A one sided photocopy of side one will be posted at the ARSCE Meeting. The original (side one and two) will be kept completely confidential. Side two will allow your résumé number to be sent back to you in time for the ARSCE Meeting. Also, it will be kept for six months after the meeting, in case a company couldn't get in contact with you at the meeting or if you were not present at the meeting.

Full Name:

Email or mailing address (where you want to receive your résumé number):

Email or mailing address and phone number where you want to be contacted if a company expresses an interest in your résumé (for up to six months after the meeting). If the address is the same as above, leave blank, but please give an email and daytime phone number:

Your résumé Number is: _____

Health Physics Society Annual Meeting Hotel Reservation Form

Tampa Marriott Waterside
700 South Florida Avenue
Tampa, FL 33602

Reservations: 888-268-1616; 813-221-4900
Reference HPS Annual Meeting When Calling
Fax: 813-204-6349

Reservations on line: www.tampawaterside.com
(bottom of form enter group code HEAHEAA for single/double; enter group code HEAHEAB for triple/quad)

Check In Time: 4:00 PM – Check Out Time: Noon

Single/Double \$138; Triple \$158; Quad \$178

Room rates are subject to the current 12% city tax. Family Plan is at no additional charge for children 17 years and younger sharing the same room with parents.

Reservation must be received and guaranteed by May 14, 2002 with one of the following:

- An enclosed check or money order covering the first night's stay to include 12% city tax.
- Amount of Check/Money Order \$_____ or
- Major credit card with an expiration date and an authorized signature.

Deposit will be charged if cancellation notification is not received by 6 pm day of arrival.

Reservations must be received by May 14, 2002. Reservations received after this date will be on a space and rate available basis. Rates are good for 3 days before and after the convention dates, based on availability.

Name: _____

Address: _____


City: _____ State/Country: _____ ZIP/Postal Code: _____

Phone: _____ FAX: _____ Email: _____

Sharing Room With: _____ # of Adults in Room: _____

Arrival Date: _____ Time: _____ Depart. Date: _____ Time: _____

Room Request: Smoking Non-Smoking **Preferred Room Type:** King 2 Double Beds

 **Accommodations for the Disabled:** The Tampa Marriott Waterside, in compliance with the American Disabilities Act, has equipment and services available. Please inform them of your needs prior to arrival. Special Requests: _____

Credit Card: American Express MasterCard VISA Diners Club Carte Blanch Discover

Cardholder's Name: _____ Exp. Date: _____

Credit Card # _____ Cardholder's Signature _____

2002 Health Physics Society

Summer School

Practical Applications of Internal Dosimetry

June 10 – 14, 2002

University of Florida, Gainesville, Florida

Academic Dean: Dr. Wesley E. Bolch Administrative Dean: Dr. Jim Durham

The 2002 HPS Summer School will focus on topics of practical interest in Internal Dosimetry. The first day will be devoted to presentations on basic topics of internal dosimetry and a review of current and upcoming model developments. Days 2 through 5 will consist of mini workshops on applications of internal dosimetry with practical examples and relevant data. Students are encouraged to bring PC-compatible laptop computers with Microsoft Excel (97 or higher) installed so that they can perform calculations with the faculty during the workshops. In addition, CDs with materials supplemental to the textbook will be distributed to the summer school students at the beginning of the course. For additional information, see the Summer School web page at <http://lamar.colostate.edu/hpschool/>.

- “The Anatomical and Physiological Bases for Internal Dosimetry” - *Wesley Bolch, University of Florida*
- “The Biokinetics of Inhaled, Ingested, and Percutaneously Deposited Radionuclides” - *Ray Guilmette, Los Alamos National Laboratory*
- “Bayesian Statistics – The Fundamentals” - *Tom Little, Los Alamos National Laboratory*
- “Case Studies – Internal Dosimetry Calculations Using Markov Chain Monte Carlo” - *Guthrie Miller, Los Alamos National Laboratory*
- “The ICRP 66 Human Respiratory Tract Model and the LUDEP Software” - *Tony James, ACJ & Associates, and Alan Birchall, NRPB*
- “IMBA Expert: Updated Bioassay and Internal Dosimetry Methodologies and Software for Use by USDOE” - *Tony James, ACJ & Associates, and Alan Birchall, NRPB*
- “Case Studies with IMBA-Based Software (Integrated Modules for Bioassay Analysis)” - *Tony James, ACJ & Associates, and Alan Birchall, NRPB*
- “Elements of Exposure, Bioassay, and Internal Dose Assessment Programs” - *Ken Skrable, University of Massachusetts Lowell*
- “Design and Conduct of Programs for the Evaluation and Control of Internal Exposures – A Framework within Regulatory and Legal Requirements” - *Ken Skrable, University of Massachusetts Lowell*
- “Case Studies in Bioassay Analysis” - *Clayton French, University of Massachusetts Lowell, Tom LaBone, Savannah River Site, Gus Potter, Sandia National Laboratory, and Ken Skrable, University of Massachusetts Lowell*
- “Internal Dose Assessment in Nuclear Medicine” - *Mike Stabin, Vanderbilt University*
- “Dosimetry for Radionuclide Therapies” - *Lionel Bouchet, University of Florida*

Registration Form

25th Annual Health Physics Summer School, June 10-14, 2002
Practical Applications of Internal Dosimetry

HPS Member No: HPS _____ Non-HPS Member: _____

Registration Deadline: May 15, 2002. Note: Registration is limited to 150 students with priority given as follows: HPS members by date of registration, Non-HPS members by date of registration

Name: _____

Affiliation: _____

Address: _____

City/State/Zip: _____

Phone: () _____

Fax : () _____

E-mail: _____

REGISTRATION FEE: Includes the course textbook, Sunday reception, Wednesday night banquet and breaks

HPS Member \$575 \$ _____

Non-HPS Member \$665 \$ _____

Note: The additional \$90 can be applied to an annual HPS membership

HOUSING

Please make individual arrangements

MEALS

This Summer School does not include meals.

RECEPTION: Program on Thursday night with Mr. Bruce Boguski. Included in the registration fee

Additional tickets @ \$15/ person # of Tickets ___ X\$15 \$ _____

WEDNESDAY BANQUET: Buffet seafood dinner and speaker. Included in the registration fee

Additional tickets @ \$30/ person # of Tickets ___ X\$30 \$ _____

Total Fees Enclosed \$ _____

Payment Information: Make check payable to: Health Physics Society

_____ VISA _____ Mastercard _____ American Express

Card Number: _____ Expiration Date: _____

Cardholder Name _____

Signature: _____

Cardholder Name (print): _____

Credit Card Billing Address: _____

Cancellation Policy: Prior to April 15, 2002, the registration fee minus \$50 will be reimbursed; prior to May 15, 2002, fee minus \$100. After May 15, 2002, no refund.

Mail To: Health Physics Society, 2002 Summer School
1313 Dolley Madison Blvd., Suite 402
McLean, VA 22101
Phone: 703-790-1745
Fax: 703-790-2672

If faxing, please do not mail the original.

Meeting Refund & Registration Policies on page 4.

American Radiation Safety Conference & Exposition

June 16 - 20, 2002, Tampa, FL

CHP? Yes No
 NRRPT? Yes No

HPS Member Number: hps _____
 Name for badge: (First) _____ (Last) _____ (Nickname) _____
 Affiliation (for badge) (limit to 18 characters and spaces): _____
 Address (for confirmation): _____
 City: _____ State: _____ Zip/Postal Code: _____
 Business Phone: _____ FAX: _____
 Email: _____ **If Registering - Companion Name:** _____

Preregistration Deadline is May 14, 2002

REGISTRATION FEES: (Mark Appropriate Boxes)	Preregistration Fees	On-Site Fees
<input type="checkbox"/> HPS Member (Sun. Reception, Mon. Lunch, Tues. Awards Dinner)	\$295	\$370
<input type="checkbox"/> Non-Member (Sun. Reception, Mon. Lunch, Tues. Awards Dinner)	\$385*	\$460*
<input type="checkbox"/> Student (Sun./Student Receptions, Mon. Lunch, Tues. Awards Dinner)	\$ 55	\$ 55
<input type="checkbox"/> Companion (Sun. Reception, Mon.-Wed. Continental Breakfast & pm snacks)	\$ 50	\$ 50
<input type="checkbox"/> Exhibition ONLY (Exhibit Hall Badge)	\$ 25	\$ 25
<input type="checkbox"/> Exhibitor (Two Per Booth)	No Fee	No Fee
<input type="checkbox"/> Additional Tues. Awards Dinner Ticket(s) # of Tickets _____	\$ 48	\$ 48
<input type="checkbox"/> AAHP Awards Lunch Ticket(s) (Tues.) '01 NEW CHP Check if attending	Free	Free
<input type="checkbox"/> AAHP Awards Lunch Ticket(s) (Tues.) CHP other than above	\$ 10	\$ 10
<input type="checkbox"/> AAHP Awards Lunch Ticket(s) (Tues.) Guest	\$ 15	\$ 15
<input type="checkbox"/> Want to be a Mentor (See page 14) _____ specialty/interest	No Fee	No Fee
<input type="checkbox"/> Would like to sign up for a mentor (available for First Time Attendees and Students ONLY) _____ specialty/interest	No Fee	No Fee

*Includes Associate Membership for year 2002.

Would you like your name included on the Attendee List? Yes No

SOCIAL PROGRAM:	Preregistration Fees	On-Site Fees	Total
<input type="checkbox"/> Treasures of Tampa City Tour (Sunday, 6/16)	# of Tickets ___ X \$39	# of Tickets ___ X \$44	_____
<input type="checkbox"/> Treasures of Tampa City Tour (Monday, 6/17)	# of Tickets ___ X \$39	# of Tickets ___ X \$44	_____
<input type="checkbox"/> Marine Eco-Tour (Monday, 6/17)	# of Tickets ___ X \$47	# of Tickets ___ X \$57	_____
<input type="checkbox"/> Golf at Eagles Golf Course (Tuesday, 6/18)	# of Tickets ___ X \$70	# of Tickets ___ X \$80	_____
<input type="checkbox"/> 5K Fun Run/Walk (Tuesday, 6/18)	# of Tickets ___ X \$25	# of Tickets ___ X \$30	_____
<input type="checkbox"/> Ringling Museum Art/Prime Outlet Shop (Tues., 6/18)	# of Tickets ___ X \$42	# of Tickets ___ X \$52	_____
<input type="checkbox"/> Golf at Tournament Players Club (Wednesday, 6/19)	# of Tickets ___ X \$93	# of Tickets ___ X \$103	_____
<input type="checkbox"/> Cook like a Chef (Wednesday, 6/19)	# of Tickets ___ X \$57	# of Tickets ___ X \$67	_____
<input type="checkbox"/> YBOR City Pub Crawl (Wednesday, 6/19)	# of Tickets ___ X \$15	# of Tickets ___ X \$20	_____
TECHNICAL TOURS:			
<input type="checkbox"/> Constellation Technology Corporation (Monday, 6/17) # of Tickets ___ X \$15		# of Tickets ___ X \$18	_____
Country of Citizenship _____ (req'd by May 15)			
<input type="checkbox"/> Food Technology Service, Inc. (Tuesday, 6/18) # of Tickets ___ X \$18		# of Tickets ___ X \$20	_____
<input type="checkbox"/> P.E.T.NET Cyclotron (Wednesday, 6/19) # of Tickets ___ X \$15		# of Tickets ___ X \$18	_____

PAYMENT INFORMATION - Government Requisitions are accepted for registration, however Purchase Orders are NOT accepted for PEP, AAHP, Social/Technical Tour Registration.

Check Payment: Health Physics Society, 1313 Dolley Madison Blvd., Suite 402, McLean, VA 22101

VISA MasterCard American Express Card Number: _____ Exp. Date: _____

Credit Card Billing Address: _____

Cardholder Name: _____ Signature: _____

Registration Section Total	\$ _____
Social Program Total	\$ _____
AAHP/PEP Total (From Back of Form)	\$ _____
Theme Parks/Other Total (Inside Back Cover)	\$ _____
TOTAL FEES ENCLOSED	\$ _____

If FAXing registration form, (703) 790-2672 please do not mail the original.

Please see reverse side of form for PEP Registration and Disabilities Information

WEB

Your Housing while in Tampa: _____ Name: _____

DISABILITIES: The Annual Meeting is accessible to persons with disabilities. Please specify assistance required and a HPS representative will contact you. _____

AAHP COURSES: Saturday, 6/15 - 8:00 AM - 5:00 PM - Each course is worth 16 Continuing Education Credits

- Course 1 - Radioactivity in Recycled Materials and Municipal & Residual Waste. *T. LaMastra* \$150.00
- Course 2 - Food Irradiation Technology. *Daniel L. Engeljohn* \$150.00
- Course 3 - Application of ANSI/HPS N13.1-1999: Sampling and Monitoring...*John Glissmeyer* \$150.00

PROFESSIONAL ENRICHMENT PROGRAM: Each PEP is worth 4 Continuing Education Credits

Sunday, 6/16 8:00 - 10:00 AM

- 1-A Currently Applicable ANSI and International Standards for HP Instruments...*M. Cox*
- 1-B NEPA Strategy and Analysis: The Health Physicist's Perspective. *T. Ikenberry;*
- 1-C The History of Release Criteria: From de minimis to BRC, to Clearance. *W. Kennedy*
- 1-D U.S. Environmental Protection Agency's Risk Assessment Methodology...*A. Fellman*
- 1-E Accelerator Radiation Safety. *V. Vylet*
- 1-F Introduction to MARLAP. *P. Frame*
- 1-G Military Uses and Exposures to Depleted Uranium. *M. Melanson*
- 1-H Facility Decommissioning Surveys: Instrumentation Selection and...*S. Brightwell*
- 1-I Analysis of Radiotherapy Misadministrations: Sources of Problems, ...*B. Thomadsen*
- 1-J Laser Safety Basics (Lasers Part 1). *T. Johnson*

8:00-10:00 AM
___/___/___ = \$40.00
1st 2nd 3rd
Yes, stand by list

Sunday, 6/16 10:30 AM - 12:30 PM

- 2-A Health Physics Instruments Standards Workshop. *M. Cox*
- 2-B New Regulations and Guidance for Dealing With Radioactivity in Solid Waste...*D. Allard*
- 2-C Environmental Radiation Exposure Litigation, Part 1. *R.H. Johnson*
- 2-D Fundamentals of External Dosimetry. *H. Prichard*
- 2-E Introduction to Food Irradiation. *G. Claycamp*
- 2-F Backgrounds, Detection Limits, and Treatment of Uncertainties...Part 1. *J. Shonka*
- 2-G Radioactive Materials Transportation, Part 1. *S. Austin*
- 2-H Biological Defense Mechanisms Induced by Low Doses...*D.R. Boreham*
- 2-I Recent Advancement of CT Technology and Associated CT Dosimetry in Adult and Pediatric Protocols. *T. Yoshizumi*
- 2-J Laser Safety Calculations (Lasers Part 2). *T. Johnson*

10:30 AM-12:30 PM
___/___/___ = \$40.00
1st 2nd 3rd
Yes, stand by list

Sunday, 6/16 2:00 - 4:00 PM

- 3-A Some HP Instrument Electronics. *M. Cox*
- 3-B Implications of Proposed Future Human Tissue Studies of the USTUR. *J.J. Russell*
- 3-C Environmental Radiation Exposure Litigation, Part 2. *R.H. Johnson*
- 3-D Radiation Dosimetry Management: Dosimeter Characteristics, ...*S. Perle*
- 3-E Radiation Quantities and Units: Their Evolution and Proper and ...*R. Kathren*
- 3-F Backgrounds Detection Limits and Treatment of Uncertainties...Part 2. *J. Shonka*
- 3-G Radioactive Materials Transportation, Part 2. *S. Austin*
- 3-H Environmental Continuous Air Monitor (ECAM). *J. C. Rodgers*
- 3-I Particle Size and Pulmonary Hazard. *H. Cember*
- 3-J Conducting a Comprehensive Laser Safety Evaluation in the Research...*B. Edwards*

2:00-4:00 PM
___/___/___ = \$40.00
1st 2nd 3rd
Yes, stand by list

Monday, 6/17 12:15 - 2:15 PM

- M-1 Is Radiation an Essential Trace Energy? *J.R. Cameron*
- M-2 Coronary Artery Radiation Therapy [CART]. *P. Vernig*
- M-3 ICRP 66 Respiratory Tract Model. *H. Cember*
- M-4 Public and Scholarly Perceptions of Radiation Risks. *O. Raabe*
- M-5 Role of the Health Physicist in Radiation Accident Management. *R. Toohey*
- M-6 Technical Basis for an Internal Dose Program. *J. Alvarez*

Monday, 12:15-2:15 PM
___/___/___ = \$40.00
1st 2nd 3rd
Yes, stand by list

Tuesday, 6/18 12:15 - 2:15 PM

- T-1 Revisions in Internal Radiation Dosimetry; ICRP Publication 68. *D. Bernhardt*
- T-2 Medical Management of Patients Vis-a-Vis Radiological Terrorist Events. *V.K. Lanka*
- T-3 Steering a Course Through the Regulatory Maze. *R. McBurney*
- T-4 The Art and Science of "Selling" Your Radiation Safety Program. *R. Emery*
- T-5 Use of MARSSIM for Decommissioning Medical Facilities. *E. Abelquist*
- T-6 Effective Communication Tools for Improved Radiation Safety Programs. *R. Johnson*

Tuesday, 12:15-2:15 PM
___/___/___ = \$40.00
1st 2nd 3rd
Yes, stand by list

Wednesday, 6/19 12:15 - 2:15 PM

- W-1 How to Have Fun Teaching Kids and Adults about Radiation. *C. Owen, K. Shingleton*
- W-2 Obtaining Optimal Image Quality and Minimal Patient Dose in X-ray Imaging. *D. Howe*
- W-3 Introduction to Non-Ionizing Radiation Safety: Practical Strategies. *J. Greco*
- W-4 A Risk Management & Insurance Primer for Institutional Health Physicists. *R. Emery*
- W-5 University Medical Center Radiation Safety Programs. *D. Derenzo*
- W-6 Calculating and Reporting Fetal Radiation Exposure from Medical Procedures. *A. Karam*

Wednesday, 12:15-2:15 PM
___/___/___ = \$40.00
1st 2nd 3rd
Yes, stand by list

Thursday, 6/20 12:15 - 2:15 PM

- TH-1 Radiation Safety in Brachytherapy. *J. O'Rear*
- TH-2 Back to Nature: The Sources and Origins of NORM. *A. Karam*
- TH-3 Medical Internal Dose Calculations - Current Practice and Future Trends. *M. Stabin*
- TH-4 Subsurface Radiological Characterization. *J. Alvarez*
- TH-5 Obtaining Optimal Myocardial Perfusion Images with Minimal Patient Dose. *D. Howe*
- TH-6 Patient Radiation Safety and Fluoroscopy. *C. Plott*

Thursday, 12:15-2:15 PM
___/___/___ = \$40.00
1st 2nd 3rd
Yes, stand by list

DISCOUNTED TICKETS ORDER FORM

CYPRESS GARDENS	ADULT	\$28.50	# of Tickets _____	X\$28.50	_____
	CHILD (6-17 Years)	\$14.66	# of Tickets _____	X\$14.66	_____
	SENIORS (55+)	\$27.38	# of Tickets _____	X\$27.38	_____
FLORIDA AQUARIUM	ADULT/SENIOR	\$9.75	# of Tickets _____	X\$9.75	_____
	CHILD (5-12)	\$6.00	# of Tickets _____	X\$6.00	_____
SALVADOR DALI MUSEUM	ADULT	\$7.00	# of Tickets _____	X\$7.00	_____
	CHILD (10-College)	\$2.00	# of Tickets _____	X\$2.00	_____
	SENIORS (65+)	\$5.00	# of Tickets _____	X\$5.00	_____
UNIVERSAL ORLANDO	1 Day 1 Park Adult	\$47.66	# of Tickets _____	X\$47.66	_____
	1 Day 1 Park Child	\$39.08	# of Tickets _____	X\$39.08	_____
	2 Day 2 Park Adult	\$96.41	# of Tickets _____	X\$96.41	_____
	2 Day 2 Park Child	\$82.63	# of Tickets _____	X\$82.63	_____

TOTAL FEES ENCLOSED \$ _____

After filling out this form, copy it and include with your fax or mail of the registration form on page 55. Transfer the total amount of tickets ordered where indicated on registration form.

WEB

HPS Secretariat
1313 Dolley Madison Blvd.
Suite 402
McLean, VA 22101
(703) 790-1745
FAX: (703) 790-2672
Email: hps@burkinc.com
Web Page: <http://www.hps.org>

**Health Physics Society
1313 Dolley Madison Blvd.
Suite 402
McLean, VA 22101**

**PRESORTED
STANDARD
PAID
Permit No. 1112
Merrifield, VA**

See You There!
San Diego, California - July 20-24, 2003