



NEWSLETTER

BMD Spring 2013



Sheraton Keauhou Bay Resort, Kona, HI, home of the MARC X conference in April 2015

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Welcome to the Winter Newsletter of the Biology and Medicine Division! The following pages provide an overview of the Biology and Medicine Division's upcoming activities and other areas of potential interest to our members. We also are working to update the website. Your feedback is greatly appreciated. We hope you find the information useful and we encourage you to get involved. There are many opportunities for involvement including the executive committee, developing ANS position papers, review of papers for the national meetings, and participation at national meetings by giving papers or helping to organize technical sessions.

Sincerely,

BMD Executive Committee

<http://bmd.ans.org>



CHAIRMAN'S MESSAGE

Greetings from your division Chair. This is my third time to hold this position, so I wanted to take a moment to quickly summarize what we did last year, the upcoming events, changes that have been made in the last several years, and finally to re-emphasize that we need your participation.

Since in addition to being the chair, I also prepare the newsletter (as time allows), I went thru some of the items emphasized in the Fall of 2010. BMD continues to support both meetings of the ANS, which is a change from the past and much of this credit goes to Rolf Zeisler, the BMD Program Chair. His efforts have been enormous and we owe him a great deal of appreciation. BMD continues to put on outstanding topical meetings, such as the recent MARC IX conference in Kona, HI. Our co-sponsored group, CMPWG, continues to be active. Participation from amongst the Medical Physics community has continued to increase and our immediate past Chair was Wayne Newhauser. We will actively participate in hosting the 8th International Conference on Isotopes (ICI-8) along with IRD and others. The ANS President has engaged BMD to develop a special session on Linear No Threshold radiation research in conjunction with the Health Physics Society at the June HPS annual meeting in Madison, WI.

I personally think the activity of BMD is significantly increased. This increase comes of course with significant time commitments of the organizers, and I want to thank them for their hard work. With that, I want to re-emphasize that we want young members to attend our Executive Committee Meetings, get involved with organizing sessions, and become part of the BMD leadership.

If there are members of BMD who would be willing and interested in serving to respond to questions from the public please let me know. Since I actively am engaged in several conferences and have significant travel commitments, getting additional resources

would be very helpful to me and to ANS. We often get medical physics and dose related questions, but if you would be willing to field some questions, please contact me with your name and field of expertise and I will be happy to send questions to members of a smallish group of volunteers.

All of these activities are meant to be a service to you, the Division member. We hope that the actions of your division Executive Board and officers are in keeping with your wishes; but, of course, we can only know that if communication between the division leadership and the membership thrives. We urgently request your continued participation in future BMD programs and, for those of you who might want to take a more active role, we have lots of committee positions just waiting for you. Please contact us!

Samuel E. Glover, PhD, Chair

**ISOTOPES FOR LIFE****ANS Embedded Topical Meetings 2008 / 2010**

In June 2008, the Division initiated new programmatic events at the ANS Annual Meeting in Anaheim. BMD provided primary sponsorship for the embedded topical “Isotopes for Medicine and Industry”. General Chair Wynn A. Volkert, University of Missouri-Columbia, and Technical Program Chair Ralph A. Butler, University of Missouri-Columbia, had put together a 3-day program with one opening plenary session (Radioisotopes—The 21st Century) and 12 technical parallel sessions covering isotope production and distribution, industrial applications, applications in medical diagnostics and therapy, as well as manpower and education. This well-attended topical meeting was a success covering core interests of BMD and IRD in today’s aspects and future development of isotope technology.

Encouraged by this success, a second embedded topical meeting Isotopes for Medicine and Industry was held at the ANS 2010 Winter Meeting in Las Vegas. The meeting drew an audience of well above 100 throughout the four days of sessions. One Keynote lecture from IAEA (W. Burkart and N. Ramamoorthy), 6 Panel contributions, and 69 invited and contributed papers were presented in 13 Sessions. The authors demonstrated the continuing rapid growth of radioisotopes for both medical and industrial applications as a matter of national and international interest. The expanding applications, new research opportunities, and associated production issues surrounding the supply of research, diagnostic, therapeutic, environmental, and industrial radioisotopes were discussed. Details of this topical meeting were highlighted in Nuclear News (January 2011, p. 79-82) and Science (Vol. 331, p. 277-279).

Winter Meeting 2012 Special Sessions

Addressing the critical medical isotopes ⁹⁹Mo/^{99m}Tc, BMD and AAD set up a Special Session series at this year’s ANS Winter Meeting on Advances in Non-HEU ⁹⁹Mo/^{99m}Tc Production Technologies. Dave Robertson and his colleagues at University of Missouri had organized 19 presenta-

PROGRAM COMMITTEE REPORT

tion on the latest developments in technology as well as the political and economic impact of this development.

Topical Meeting 2014

BMD, IRD, and AAD will continue supporting these highly relevant topics. A third edition of the embedded topical meeting was postponed in favor of our participation in the 8th International Conference on Isotopes (8ICI) to be held by ANS in Chicago, IL, August 24-28, 2012.

The International Conference on Isotopes (ICI) began in 1995 and is now held every three years to highlight the importance of nuclear science, medicine, and technology in advancing human health and protection of the environment. The ICI conferences are organized under the auspices of the World Council on Isotopes (WCI) and a participating national organization. For 2014, the American Nuclear Society will be organizing the 8th ICI and welcoming delegates from around the world to Chicago in August 2014.



The 8th ICI will assemble an international community of nuclear and medical physicists, radiochemists, engineers, material scientists, physicians, health physicists, and others for an interdisciplinary discussion of current and future research



in the field of isotopes. The goal of the Conference is to maintain the multifaceted exchange established in previous conferences among the developers and producers of isotopes and the researchers developing and applying isotopes in medicine, industry, agriculture, and other fields.

Sessions will include, but are not limited to, accelerator and target physics and production technologies including reactor-based procedures and facilities, radiochemistry and analysis in isotope and device preparation and development of new isotopes. Applications of isotope methods in medical therapy and diagnostics, radiopharmaceuticals, uses in industry, agriculture, and in research will be discussed, together with basic research on properties of isotopes, and an expanded section on isotopes in the environment.

Complementing the scientific and technical program, an exhibition on isotope production, distribution, devices, applications and measurements, as well as academic, government, educational, and other institutions essential to sustaining the field will be held during 8th ICI. The exhibits are expected to range from high-flux reactors, heavy-ion accelerators over desktop cyclotrons and medical devices to miniature and nanoscale power sources, from national academic curricula and training programs over education of the public to international nuclear and economic organizations' efforts to assure safety and reliable supply of critical medical isotopes.

The organizers are Paul Dickman, General Chair; Rolf Zeisler, Program Co-Chair; Steve LaMont, Program Co-Chair; Sam Glover, Publications Chair; Nigel R. Stevenson, Assistant General Chair; J. David Robertson, Bryan Bednarz; Kenan Ünlü, and Philip L. Cole, Division Representatives. The organizers are supported by a Technical Program Committee with 39 members from the US and abroad.

NUCLEAR ANALYTICAL TECHNIQUES

We sponsored our first tutorial session "Neutron Activation Analysis – Status after Five Decades" in Anaheim 2008. The intent was to provide a comprehensive discussion of the basics of the

method, complementary techniques which have been derived to enhance either the sensitivity or applicability of the method, and to take a realistic look at the place activation analysis holds in today's analytical world. The tutorial aimed at refreshing knowledge of professionals in the nuclear science and applications domain and providing a glance at the synergistic opportunities for young professionals and older hands alike to integrate activation analysis into today's methods and practice. Additional special sessions for the 2008 Annual Meeting included studies in Radiochemical Separations and Neutron Depth Profiling.

A second tutorial "Neutron Activation Analysis – Frontiers and Sustained Performance" was held at the 2011 ANS Winter Meeting in Washington, DC. The tutorial aimed at refreshing knowledge of professionals in the nuclear science and applications domain and to provide a glance at the synergistic opportunities for young professionals and older hands alike to integrate activation analysis into today's methods and practice. The speakers presented the basic principles of activation analysis and detailed different types of activation analysis. Emphasis was given to instrumental neutron activation analysis and radiochemical separations for the determination of trace and ultra-trace elements. Location sensitive analysis was also included. With descriptions of the uses of research reactors, neutron beam facilities, and neutron generators the tutorial illustrated up-to-date performance of the NAA techniques. Bob Greenberg, Dick Lindstrom, Dennis James, and Rolf Zeisler had an eager audience in densely packed lecture room.

BMD continues its support of the topic of nuclear analytical techniques in sponsored or co-sponsored sessions: *(Anti) Coincidence Instruments and Software for Activation Analysis and Other Applications* at the 2008 Winter Meeting Reno, NV; IRD's *Neutron Radiography and Neutron Computed Tomography* and *Nuclear Research Reactors: Utilizations and Applications of Nuclear Methods* at the 2009 Annual Meeting, Atlanta, GA; BMD and IRD's Symposium on *Nuclear Analytical Methods for the 21st Century* at the 2009 Winter Meeting Washington, DC; IRD's *Innovations in Radiation Detectors: New Designs, Improvements, and Applications*, and BMD's *Innovation*



in *Software for Radiation Detection* at the 2010 Winter Meeting Las Vegas, NV; IRD's *Innovations in Radiation Detectors: New Designs, Improvements, and Applications and Impact of DOE-NEUP to Research Reactors and Nuclear Science Programs* at the 2011 Annual Meeting Hollywood, FL; IRD's *Innovations in Radiation Detectors: New Designs, Improvements, and Applications and University Research Reactors and Nuclear Science Programs—I & II* at the 2012 Annual Meeting Chicago, IL.

The 2013 Winter Meeting in Washington, DC, will provide us with the opportunity to organize a Symposium on Nuclear Methods bringing together our broad research community in the US and from abroad. Sessions will be organized to represent the many active research areas that use nuclear methods: Arts and Archaeometry (Session honoring J. Blackman; Organizer: R. Zeisler), Biological Trace Elements (Session honoring A. Chatt; Organizers: R. Zeisler & D. O'Kelly), Environmental Studies (Organizer: K. Grogan), Advanced Prompt Gamma AA and Gamma Spectrometry (Organizer: Rick Paul)

MEDICAL DIAGNOSTICS AND TREATMENT

BMD's long-standing engagement in this area has been significantly enhanced over the past five years by the close co-operation with the Computational Medical Physics Working Group (CMPWG) and broader engagement with medical physicists in general. The 2008 Winter Meeting brought a special session on *Advances and Issues in Computational Phantom Modeling* in collaboration with CMPWG, followed by a special session on *Nuclear-Based Imaging for Medical Diagnosis* at the 2009 Annual Meeting. BMD co-sponsored AAD's session on *Medical Accelerator Research and Progress* at the 2009 Winter Meeting and continued its engagement with *Proton and Ion Treatment of Cancer* at the 2011 Annual Meeting, and *Therapeutic Beams—The Wider I/O Chain* and a FLUKA tutorial organized by M. Chin at the 2011 Winter Meeting. At the 2012 Annual Meeting BMD sponsored sessions on *Modeling and Simulation of Brachytherapy Sources* (with CMPWG), *Accelerators and Detectors Used in Medical Therapy* (with AAD) and *Proton Imaging Technology for Proton Therapy* (with AAD and CMPWG).

For the 2013 Annual Meeting the Call for Papers is issued for a Special Session on *New Horizons in Medical Physics* organized by B. Bednarz.

OTHER PROGRAMS

BMD is supporting a considerable number of conferences, symposia, and workshops outside the ANS Annual and Winter Meetings with topics relating to our core activities. These are hosted by other ANS Divisions and/or national and international organizations. Through our initiative ANS is co-sponsoring these meetings and listing them in its calendar, and, as an additional benefit to our members, this co-sponsorship by ANS secures reduced registration fees for these meetings that are equal to those offered to the members of the principal organizers.

We hope that the sum of our programs serves all of our members as well as colleagues in our field in general. We believe that we cover in our sessions and sponsored meetings the BMD goals and objectives, but, as always, there is room for improvements. We need to attract more young scientists and non-ANS affiliated colleagues to our program for even stronger sessions and meetings. The one successful way to do this is through you, our existing BMD and associated members. Please step forward with your thoughts, your proposals, and your contributions to our progress.

Rolf Zeisler, Program Committee Chair



CONFERENCES AND EMBEDDED TOPICAL MEETINGS

MARC IX-METHODS AND APPLICATIONS OF RADIOANALYTICAL CHEMISTRY

MARCH, 2012

The Biology and Medicine Division along with the Isotopes and Radiation Division and Northern California section of the ANS hosted the 9th International Conference on Methods and Applications of Radioanalytical Chemistry. The conference was held in March, 2012 in Kona, HI. Over 250 scientists and 50 students attended the meeting. Additional details of the conference and proceedings may be found at the conference website: <http://www.marcconference.org>

The Journal of Radioanalytical Chemistry and the International Committee on Activation Analysis (ICAA) awarded the Hevesy Medal Award to Dr. Boris Myasoedov.



Professor A. Chatt, ICAA, presenting the Hevesy Medal Award to Dr. Boris Myasoedov, Russian Academy of Sciences

Plans are already underway for MARC X in April of 2015, to again be held at the Sheraton Keauhou Bay Resort in Kona, HI. Please contact Sam Glover (sam.glover@uc.edu) or Steve LaMont (lamont@lanl.gov) with any questions regarding the MARC conference. Abstracts are due November 15, 2014 for those of you looking ahead!

Mahalo,
MARC Organizing Committee

Food Irradiation @ MARC-IX

The well-established ANS Topical Meeting series on Methods and Applications of Radiochemistry (MARC) in its ninth incarnation March 25 to 30, 2012 in Kona, HI added a day of workshops to its scientific program. In the workshop “Processing of Food by Irradiation” we reviewed status and trends of this nuclear technology. In four presentations we reviewed latest scientific advances in food safety and preservation technology, uses and enterprise considerations in Hawaiian exports, as well as the commercial future of food irradiation.

Monique Lacroix, INRS-Institut Armand-Frappier, Canadian Irradiation Centre, Quebec, presented an appetizing account on the benefits of irradiation and combined treatment of agricultural products (Fig. 1). Peter Follet, USDA-ARS, Hilo, HI, demonstrated the phytosanitary treatment of Hawaiian products, enhanced by a generous sampling of irradiation processed tree-ripened papayas

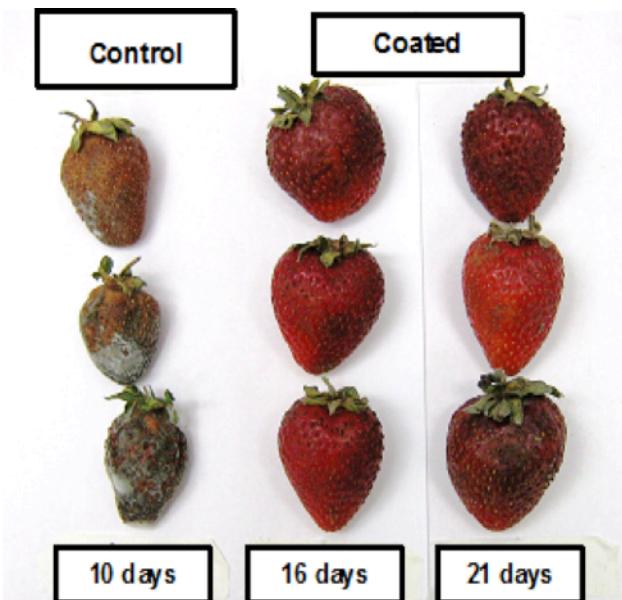


Figure 1. Preservation of fresh strawberries through coating and irradiation. Would consumers prefer the extended shelf life?



offered to the workshop participants, and Michael Kohn and Lyle Wong, Pa'ina Hawaii, Honolulu, HI, presented their business plan for the export of superior quality products to the US and abroad. Joseph Butterweck, Aerospace and Environmental Medicine Group, Fresno, CA, discussed the commercial future of food irradiation including a world-wide overview of current use (Fig. 2). The workshop then opened into a broader discussion of advances in nuclear technology and public acceptance.

As we can see from the latter figure, the United States can be considered at the forefront in the radiation based food preservation technology. Although this tracks the perception of the United States as a leader in nuclear technologies in many aspects of human life, food irradiation is not a "topic of interest" that attracts public or private funding for research and development. It also seems to have vanished from the scope of the approving and regulating agencies (FDA and USDA) as well as from the professional societies, including ANS. Yes, position statements are maintained that advocate the wholesomeness of the process, but they do nothing to educate consumers as well as food processors and regulators on the proven advantages of the technology.

The diverse professional membership of ANS could provide an appropriate home for a renewed

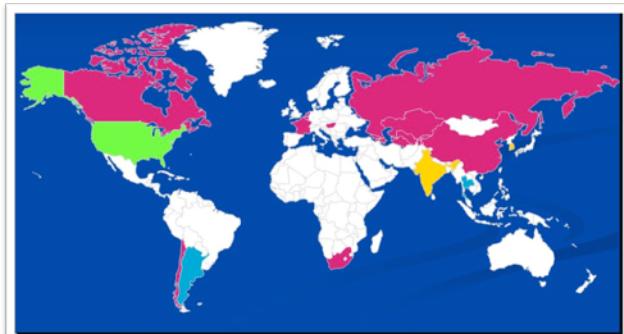


Figure 2. Commercial use of food irradiation

scientific and commercial approach in this technology. As the ANS members are continuously striving to preserve and extend our stewardship of the nuclear technologies, positions on the safety of irradiators, higher efficiency irradiators, and continued education and public information should be developed.

We have collected a small group of engaged professionals to overcome the apparent stagnation or even decline in the development and applications of nuclear science and technology in food safety and availability (<http://bmd.ans.org>). We intend to develop a series of technical sessions and workshops that will bring together the expertise from the various disciplines within ANS, the nuclear technology research centers, and the food production and processing sector.

VOGT AWARD

Chad Durrant is Awarded the 2012 James R. Vogt Radiochemistry Scholarship

Each year the Isotope and Radiation Division James R. Vogt Radiochemistry Scholarship Committee evaluates undergraduate and graduate students for the James R. Vogt Radiochemistry Scholarship. The scholarship is named for Dr. James R. Vogt who spent most of his professional career at the University of Missouri. At the time of his death, he was Program Manager for Nuclear Analysis at the Research Reactor Facility and was Professor of Nuclear Engineering. Dr. Vogt's contributions to the field of radioanalytical chemistry were many and they have been recognized internation-

ally. He is best remembered as the inspiration and organizer of the "Missouri" Conferences that, during the passing years, became the major forum for radioanalytical chemistry and its applications in the United States.

Applicants for the James R. Vogt Radiochemistry Scholarship must have completed a minimum of two years in an accredited undergraduate program and be enrolled in a four-year college or university in the U.S. Undergraduates in their junior and senior years and graduate students in their first or second year of graduate study are eligible to apply. Students must be engaged in proposing to undertake graduate or undergraduate research in radioanalytical chemistry or its applications. Appli-



cants must be U.S. citizens or hold permanent-resident visa at the time of application.

This year the IRD Awards Committee evaluated nine (9) undergraduate and five (5) graduate applicants. The committee's choice was Mr. Chad Durrant of the Pennsylvania State University. Mr. Durrant is currently in his third year of graduate study working on a Ph.D. in Nuclear Engineering with Professor Kenan Ünlü. At the June ANS meeting in Chicago Mr. Durrant was a co-author of a paper entitled "Reactor Based Production and Purification of ^{64}Cu and ^{67}Cu ." The scholarship recipient receives a \$3000 award.

The award committee included Jack Brenizer, Steve Lamont, Lav Tandon, Lin-Wen Hu, Greg Downing and John Metzger.