

## SCOUTING FOR NUCLEAR SCIENTISTS



Boy scouts from over 11 local and regional troops attended the annual Nuclear Science merit badge training in March.



## INSIDE: MERIT BADGE TRAINING

JIGGLE GELS & MIDDLE SCHOOL GIRLS  
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DID YOU KNOW?

## EOU STUDENT MEMBERS EARN OUTSTANDING AWARD AT 241ST NATIONAL MEETING

The Eastern Oregon University ACS student members attended the 241st National Meeting held this past March in Anaheim where they presented posters for their research, participated in the Chem Demo exchange and received an outstanding award for their activities during the 2009-10 academic year. The award recognizes the many achievements ranging from community outreach to professional networking and engagement in undergraduate research. They were one of 36 chapters in the nation to receive an outstanding award out of 230 that submitted a report. The Chapter also received a Green Chemistry award for collecting paper and cereal boxes to make recycled laboratory notebooks.



*Anna Cavinato with the EOU Students at the Anaheim ACS National Meeting.*

## NUCLEAR SCIENCE MERIT BADGE TRAINING IS HOT

The 8<sup>th</sup> annual Nuclear Science merit badge training was held on March 19 and 26, 2011 at the WSU Tri-Cities campus (Consolidated Information Center). A total of 33 scouts, representing 11 local and regional (including Beverly, La Grand, Mesa, Hermiston, Ellensburg, and Port Townsend) troops, attended the training session. Scouts are required to demonstrate knowledge of 12 different requirements delineated in the Nuclear Science merit badge booklet. During the course of this training session, the scouts were exposed to at least 10 instructors active in some aspect of the nuclear science field, helping them to learn and complete these requirements.

After an introductory lecture by Richard Arthur (PNNL, retired) to explain a little about the nucleus and radiation, the scouts divided into five groups (by grade/education) for rotation through five specific workstations.

They learned about ALARA and safety with Angie Hall (PNNL), then they tried on personal protective equipment (gloves and coveralls).

Steve Powers (Areva) showed the scouts how to build cloud chambers, and then they watched the ionization “contrails” of alpha and beta emissions from U ore.

Mike Davis (Energy Northwest) helped the scouts navigate the myriad of ways we define and measure personal radiation exposure as well as help the scouts define what radiation dose they receive as members of planet Earth.

The scouts investigated distance and shielding effects measured from a large variety of sources

available in the community (think Lantern mantles, camera lenses, Fiesta Ware, antique beads, thoriated welding rods, WWII airplane gauges, and salt substitute [KCl]) with Richard Arthur.

Frank Roddy (DOE-RL) explained fundamentals about nuclear power plants and helped the scouts map local, national, and international nuclear power plants.

Each scout was sent home with a nuclear science merit badge book, the Nuclear Science Chart, dose equivalence chart, a pass to the CREHST museum, homework, a variety of supporting handouts, and a Civilian Defense vintage Geiger-Mueller counter (complements of the Eastern Washington Section ANS). Most discussions were laced with the current events in Japan as well as a final follow-on discussion of the Fukushima Daiichi plant to interested scouts and parents.

The second day the scouts broke out into their assigned groups for another morning packed with information.

The scouts gave an oral presentation on the information they learned about their assigned historical figure in nuclear science (think Marie Curie, Ernest Rutherford, Otto Hahn, Lisa Meitner, Henri Becquerel, etc.). Dave Ottley (CHPRC) helped fill in the gaps.

The scout’s shared their choice of a career opportunity in a field related to nuclear science (including education required) in discussions led by Don Stewart (Dade Moeller & Associates, Inc.).

The scouts honed their knowledge of isotopes, neutrons, and protons by building 3-D models of

hydrogen isotopes with Chris Orton (PNNL); naturally tritium was built with glow-in-the-dark glue.

The scouts discovered the biological effects of radiation exposure with Mark Hulke (Washington River Protection Solutions).

Ron Pawlowski (PNNL) helped the scouts understand fission, fusion, and criticality.

Finally the scouts demonstrated knowledge of an extensive list of definitions through a matching exercise; several scouts scored 100%!

After the second morning of intensive study, the scouts carpoled to Areva where company volunteers hosted a pizza lunch, then provided tours through their numerous facilities.

In the end, 27 scouts completed all requirements to earn the BSA Nuclear Science Merit Badge. Six scouts went home with a “partial” meaning that they could complete the missing requirements (think undone homework) at their own pace with a merit badge counselor.

ACS Richland Section’s Sandy Fiskum organized this event but it would not have been possible without financial and in-kind support from the Richland Section and sister organizations. Thanks to your support, the scouts (and several parents) have learned a tremendous amount about the radioactive world around them. Several scouts have expressed interest in pursuing careers in the nuclear science field. This training format has been well received by the scouts, their leaders, and parents. The Nuclear Science merit badge training has now been offered in this format annually over the last eight years introducing about 230 scouts to Nuclear Science. Let’s see if we can get the Girls Scouts interested, too.

## ABOUT MERIT BADGE TRAINING

The Tri-Cities offers a unique nexus of Nuclear Science industries and professionals from nuclear power production (Energy Northwest and Areva), nuclear medicine (Kadlec, Tri-Cities Cancer Center, and Kennewick General Hospital), linear accelerator (Advanced Medical Isotope Corporation), and environmental remediation, waste processing, and R&D (plurality of Hanford contractors and PNNL).

Additionally, three major professional societies are active in the Tri-Cities helping to support this program: the Columbia Chapter of the Health Physics Society, the Richland Section American Chemical Society, and the Eastern Washington Section of the American Nuclear Society.

The Tri-Cities of course has a long history dating back to the Manhattan Project which our local CREHST museum helps to bring alive. Drawing from these resources, few places in the U.S. are as uniquely qualified to put on a training session as comprehensive and rigorous as what we present.

The Nuclear Science merit badge is one of 120 merit badges offered by the BSA. Earning merit badges gives Scouts a glimpse of occupations in the subject area as well as some hands-on experience under the tutelage of experts in the field. Each merit badge has a different set of specific requirements. Scouts must earn 21 merit badges to obtain Eagle status.



## JIGGLE GELS AND MIDDLE SCHOOL GIRLS



The ACS Richland Section was again part of the March 19, 2011 Expanding Your Horizons (EYH) workshops held in Richland, WA at the WSU Tri-Cities Campus. This event targets middle school girls—particularly from minority communities.

Over 140 students registered for the event. The “Jiggle Gels - Exploring Properties of Polymers” workshop used by Janet Bryant of our Section is part of the Kids & Chemistry program developed by the ACS to support science professionals who want to share their love and knowledge of science with elementary and middle school students. EYH is all about hands-on activities in science, technology, engineering and mathematics (STEM) and having fun—with a take-home message that they can indeed see themselves in the STEM disciplines in the future. The chemistry workshop was so well-received by the first group of students, that word spread quickly and several students “migrated” to the second session that afternoon!

The workshop started with a quick demo and then an activity on the absorbency of sodium polyacrylate, which is the polymer powder found inside the lining of most disposable baby diapers. After adding water and building quite

a sizeable mound of gel, the students found that table salt, added to the polymer, releases the polymer's hold on water. (We learned that salt disrupts the attraction between water and the polymer chain; water molecules become more attracted to the sodium and chloride ions from the salt, than the polymer chain, and the water leaks out.) No polymer workshop would be complete without “super slime” to take home (green this time), but we also talked about and demonstrated how the polyvinyl alcohol (PVA) used to make slime is also quite an amazing material. PVA sheets make dissolving plastic bags used in the health-care industry to protect workers from diseases and germs found on bed linens. Each student also took home a “Gro Dinosaur” to experiment with family and teachers (several of whom were also in attendance).

Many thanks to Staci West of PNNL's Environmental Molecular Science Laboratory (EMSL) for assistance with the safety aspects of our day by providing safety goggles, lab coats, and MSDS sheets on the materials being used. And thanks to WSU Tri-Cities, Yakima Valley MESA and Women in Nuclear (WIN) for organizing the EYH event.

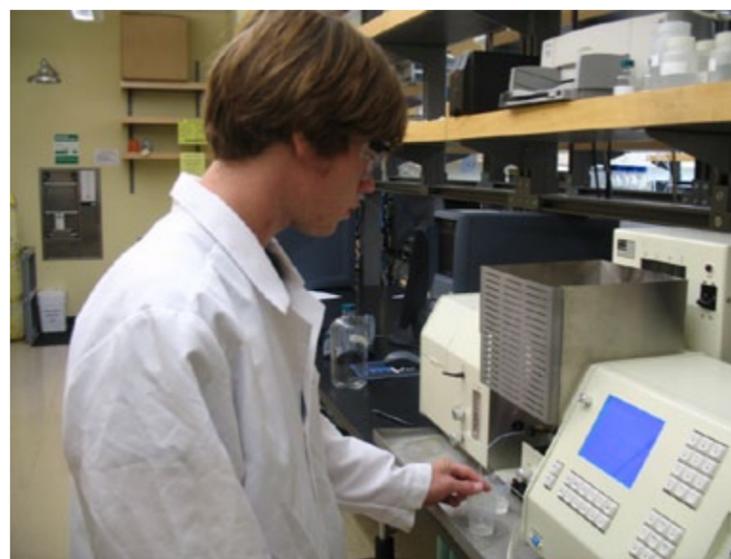


## RICHLAND SECTION RECEIVES PROJECT SEED AWARD

The Richland Section has been awarded a Summer II Project SEED position to support a high school student to conduct research over summer 2011. Project SEED funds economically disadvantaged junior and senior high school students to spend the summer months in an academic or industrial lab and experience what being a chemist is all about!

The Summer II program specifically supports students that have already completed work during the first summer and are ready for the extra challenge. The award will go to support James Dyke of Union, OR, who will work at Eastern Oregon University under the supervision of Dr. Anna Cavinato.

Dyke, an incoming senior at the La Grande High School, will continue the work initiated in summer 2010 characterizing soil that supports growth of native plants on the Umatilla Indian Reservation. The work is being conducted in collaboration with the Department of Science and Engineering of Confederated Tribes of Umatilla Indian Reservation (CTUIR).



James Dyke at Eastern Oregon University conducting flame atomic absorption measurements on soil samples last summer.

## DID YOU KNOW?

Marie Sklodowska Curie was...  
..the first famous woman scientist in the modern world.

...the “Mother of Modern Physics”—a pioneer in research about radioactivity (a word she coined).

...the first woman awarded a Ph.D. in research science in Europe and first woman professor at the Sorbonne.

...the scientist who discovered and isolated polonium and radium, and established the nature of radiation and beta rays.



Pierre and Marie Curie in their Paris laboratory, before 1907.  
Photographer unknown. No known copyright restrictions.

Polonium was the first element discovered by M. Curie in 1898, while seeking the cause of radioactivity of pitchblende from Joachimsthal, Bohemia.

It required several tonnes of pitchblende to produce very small amounts of polonium. M. Curie named polonium after her birthplace: Poland.

Radium was also discovered by Pierre and Marie Curie in 1898. Origin of name: from the Latin word “radius” meaning “ray”. M. Curie isolated 0.1 g radium (as  $\text{RaCl}_2$ ) in 1902.

## LEARN MORE ONLINE

[http://womenshistory.about.com/od/mariecurie/p/marie\\_curie.htm](http://womenshistory.about.com/od/mariecurie/p/marie_curie.htm)

<http://www.webelements.com/polonium/history.html>

## 11 COMING EVENTS

**JUNE 26-29**

**NORM**

Portland, Oregon, [www.norm2011.org](http://www.norm2011.org)

**SECOND WEDNESDAY OF EVERY MONTH**

**Standing Board Meeting**—All are welcome to attend.

WSU Tri-Cities (Room 247 West -Jun/Jul/Aug/Dec; and CIC 223 -Sep/Oct/Nov), 6 - 7:30 p.m.

**JUNE Annual Member Picnic**

**AUGUST 28 - SEPTEMBER 1**

**242nd Annual ACS National Meeting & Exposition**

Denver, Colorado

Program Theme: Chemistry of Air, Space, & Water

VISIT THE SECTION WEBSITE FOR UP-TO-DATE CALENDAR ITEMS & MORE INFORMATION



<http://acs.labworks.org>

## NATIONAL MEETING NEWS

### From our Councilor

Our Section councilor, Richard Hermens, brings news from the 241<sup>st</sup> ACS National Meeting & Exposition at Anaheim CA, March 27-31:

The two candidates you will be voting for later in the year for president-elect of the ACS are Marinda Wu and Dennis Chamot. Their statements and personals will be issued later in the year.

The ACS annual full membership dues will escalate \$2 from the 2011 to the 2012 year.

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