

National and International Impact Report

Nuclear Science Week 2015



Nuclear Science Week

About Nuclear Science Week and its Mission

A Message from the National Steering Chair:

Nuclear Science Week (NSW) has become a grass-roots community programming opportunity to engage in STEM learning, career interest and discernment, and to just learn more about the important positive impact that nuclear science has on the world. Whether you are interested in energy technology, global climate impact, research into new materials, energy production, medical

processes, or education, **Nuclear Science Week** is a chance to focus on the topic of nuclear and learn more.

I am pleased to provide this report, although it cannot hope to capture every event, aspect, and nuance of the many people and organizations that participated in Nuclear Science Week, 2015. Nuclear Science Week expanded into new service areas and thereby impacted far greater audiences in 2015 than in past years.

Let me thank each person that presented in our new areas in Canada, the United Kingdom, and the United Arab Emirates as well as partners in the US for incredible effort in 2015.

This report should help partners, participating organizations, sponsors, and the public to see the rich opportunity for discussion and dialogue about the important role that nuclear energy plays in our world. Through countless contacts, celebrations, presentations, one-on-one interactions, visitations, and webcast viewings, NSW brings a kaleidoscope of current technical information, career paths, research excitement, industrial applications, and medical practices to many people. Many of these are school students who know little about this energy form but are excited to learn more. Much outreach takes place in these communities, but even more remains for the years ahead. If you are one of the many participants in NSW 2015, I thank you, and I hope you will join with us again next year with an observance that is unique to your interest, organization, or community.

James Walther
Chair
National Steering Committee
Nuclear Science Week

National Steering Committee Members: Nuclear Science Week is proud to acknowledge the engagement of these fine people that contribute time and energy to the development of each year's observances and activities.

- **Azi Abrishami:** Development Coordinator, National Science Teachers Association
- **Suzanne Hobbs Baker:** Idaho National Laboratory
- **Tracy A. Coyle:** Outreach Manager, American Nuclear Society
- **Rachael Cutrufello:** Director of Education, National Museum of Nuclear Science & History
- **Susan Downs:** Business Operations Analysis Specialist, Nuclear at PPL Susquehanna, LLC, and Communications Committee Representative, Women in Nuclear

- **Jennifer Hayden:** Director of Marketing & PR, National Museum of Nuclear Science & History
- **Mindy Mets:** NWI Program Manager, Savannah River Site Community Reuse Organization
- **Kyan Ramirez:** Graphic Design & Marketing Associate, National Museum of Nuclear Science & History
- **Bill Harris:** Communications Exelon Corp.
- **Kim Saxon:** Assistant Coordinator, Savannah River Site Community Reuse Organization
- **Adrian Bull:** United Kingdom event team **Director of External Relations UK National Nuclear Laboratory**
- **Dr. Jason Donev:** Professor of Nuclear Engineering, University of Calgary
- **Ivan Baldwin:** United Kingdom event team
- **Krisry Gogan:** Founder, Energy for Humanity
- **Elizabeth McAndrews-Benavides:** Manager of Communication, NEI
- **Tara Pandya:** Oak Ridge National Laboratory, Co-Chair, NSW 2015 Knoxville & Oakridge
- **Chris Perfetti:** Oak Ridge National Laboratory, Co-Chair, NSW 2015 Knoxville & Oakridge
- **Julie Ezold:** Oak Ridge National Laboratory, event team, NSW 2015 Knoxville & Oakridge
- **Joanna Spahr:** Society of Nuclear Medicine and Molecular Imaging
- **Laura Scheele:** Idaho National Laboratory
- **Jeff Terry:** Professor of Physics, Illinois Institute of Technology
- **Angela Shogren:** Project Manager RADTOWN, EPA
- **Alexandra Vazquez:** Senior Engineer, Duke Energy and Public Information Chair, North American Young Generation in Nuclear
- **Jim Walther:** Museum Director and Steering Committee Chair, National Museum of Nuclear Science & History
- **Jamie Williams** – Manager of Grass Roots and Outreach Programs, Nuclear Energy Institute

Nuclear Science Week “Big Event” 2015 Report, Knoxville, TN

The 2015 Nuclear Science Week “Big Event” took place at the Knoxville Convention Center in downtown Knoxville, TN, on October 22 – 24, 2015.

This three-day event was structured such that each day targeted a different audience.

- Thursday, October 22, was the field-trip day, where elementary, middle, and homeschool students were bussed to the “Big Event” to learn about nuclear science by engaging in fun science experiments and hands-on demonstrations (see Figure 1). This day also featured several technical tours of facilities around Knoxville and Oak Ridge including Oak Ridge National Laboratory and Provision Proton Therapy Center.
- Friday, October 23, was the technical day, offering a full-day of technical panel sessions featuring experts in diverse subject areas from around the world. This day was designed to appeal to college students at the University of Tennessee and nuclear science professionals in the east Tennessee area. The day’s panel sessions, which are described in more detail in Table 1, were live streamed for all to enjoy.

The first day of the Technical Expo was also on Friday, which featured booths from our sponsors. The highlight of the day was a speech and book signing by the Pulitzer prize-winning author, Richard Rhodes.

- Saturday, October 24, was the public outreach day, where we opened the doors of the Big Event for all to learn about nuclear science. Several activities of the day included workshops for Boy Scouts, Girl Scouts, and science teachers; fun science experiments and demonstrations at the Knoxville Convention Center; a Technical Expo; and a nuclear science information booth at Knoxville’s weekly farmer’s market.

Each day produced many interactions with people who wanted to learn about nuclear science, and most events were reasonably well attended, as shown in Table 2.

We would have preferred even higher attendance at our events and can only guess why some attendance numbers were low. Advertising for the “Big Event” was coordinated with the help of ORNL’s communications staff and included radio advertisements and appearances on local news shows. The advertising seemed quite effective. We conjecture that some of the low attendance numbers may be due to the “Big Event” being a single occurrence in Knoxville. We expect the Big Event may have been more broadly attended if it was an annual or reoccurring event in the same city.

All photos have been uploaded to a Dropbox account which we have given access to the following individuals: Jim Walther jwalther@nuclearmuseum.org, Kyan Ramirez kramirez@nuclearmuseum.org, and Jennifer Hayden jhayden@nuclearmuseum.org. Please contact Chris Perfetti, perfetticm@ornl.gov, or Tara Pandya, pandyatm@ornl.gov, for any captions needed for these photos.

List of panelists/speakers from NSW Big Event 2015

Around the world in 80 minutes: A look at nuclear industries around the world

Panelists: Mr. Adrian Bull Director of External Relations UK National Nuclear Laboratory

Dr. Ondrej Chvala Research Assistant Professor, Nuclear Engineering Department
University of Tennessee

Mr. Dan Stout Senior Manager for Small Modular Reactors TVA

Mr. David Varner Chief Procurement Officer Westinghouse What's new in nuclear

Dr. Jeff Chapman R&D Staff in Safeguards and Security Technology ORNL

Dr. Alan Icenhour Associate Laboratory Director for the Nuclear Science and
Engineering Directorate ORNL

Mr. Alan Moore Senior Manufacturing Specialist for Y-12 Site Operations Y-12

Historical Look at Nuclear Developments: Panelists:

Mr. Richard Rhodes, Pulitzer Prize-Winning Author

Mr. Ray Smith Y-12 historian, author

Medical Applications in Nuclear Science &Engineering: Panelists:

Dr. Rose Boll R&D Staff in Nuclear Security and Isotope Technology ORNL

Dr. Nicholas Dainiak Medical and Technical Director REAC/TS

Dr. Niek Schreuder Vice president and Chief medical physicist Provision Proton Therapy
Center

Dr. Michael Stabin Associate Professor in the Department of Radiology and Radiological
Sciences Vanderbilt University

Outreach and Mentoring: Panelists:

Dr. Nicie Murphy Science Education Project Manager ORAU

Dr. Brad Rearden SCALE Code System Manager ORNL

Dr. Jibo Sanyal Staff scientist and adjunct faculty ORNL, Mississippi State University

Mythbusting: How to be a good steward of Nuclear Science &Engineering

Panelists:

Mr. Rod Adams Blogger Retired U.S Naval Commander, Atomic Insights

Dr. Matthew Francis R&D Staff in Nuclear Security Modeling ORNL

Dr. Joshua Jarrell Strategic Crosscuts Control Account Manager for DOE-NE Nuclear Fuel Storage and Transportation Planning Project ORNL

Special Screening and Panel: Pandora's Promise

Dr. Doug Kothe Deputy Associate Laboratory Directory of the Computing and Computational Sciences Directorate ORNL

Dr. Steve Skutnik Assistant Professor in Nuclear Engineering University of Tennessee

Dr. John Wagner Reactor and Nuclear Systems Division Director ORNL

Mr. Jim Walther Director National Museum of Nuclear Science and History, Albuquerque New Mexico

Attendance summary from NSW Big Event 2015.***Thursday, October 22, 2015***

Hands on demonstrations and experiments for K-5 kids	200
Provision Proton Therapy Center tours (4 total)	15
Oak Ridge National Laboratory tour	13
Reception	75

Friday, October 23, 2015

Tech Expo	100
Historical Radiological Instruments Museum tour	4
Panel Sessions and Speakers (6 sessions)	150
Pandora's Promise movie screening	30

Saturday, October 24, 2015

K-12 Science Teacher Workshop	17
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Boy Scout/Girl Scout Badge Workshop

25

Hands on demonstrations and experiments

100

Participating Sites: Aiken South Carolina (site of NSW 2013)



Organizations received positive support from companies who conducted events and activities last year. Also, had support from seven new companies who did not participate last year. Many are eager to do it again in 2015. Below are a list of events and activities that took place regionally:

2015 NSW Regional Events & Activities in Aiken

- Education Days
 - Ruth Patrick Science Education Center (Aiken, SC)
 - Georgia Regents University- Augusta (Augusta, GA)
- Site Visit/Tour Days
 - Southern Company – Plant Vogtle (Waynesboro, GA)
 - SCANA VC Summer Plant (Jenkinsville, SC)
 - Savannah River Site (Aiken, SC)
- STEM Career Connections Day (Augusta, GA)
- Annual Edward Teller Lecture (Aiken SC)

2015 Other events in the area

- NSW Color Poster – Nuclear Career Pathway
- CNTA – Aiken Standard Newspaper Insert
 - Celebrating NSW with a series of teaching, informational and topical articles.

Direct Regional Impact

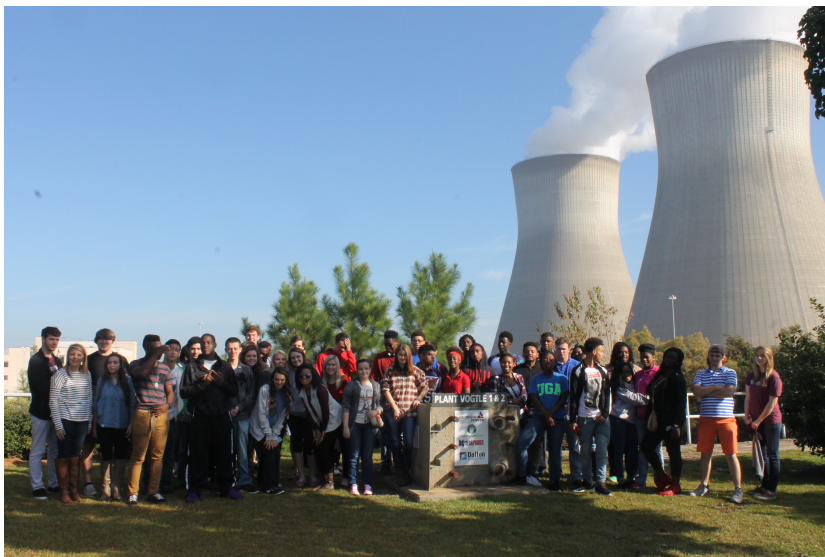
- Participating in Events & Activities
 - 1,455 participants

Direct Regional Support

- Companies, Educational Institutes & Volunteers
 - 35 companies & educational institutes
 - 176 staff volunteers

Indirect Regional Impact (Information Sharing)

- Schools, Students, Educators, Companies and General Public (Regional Poster Distribution, CNTA NSW Newspaper Insert & Regional Website)
 - 1,500+





American Nuclear Society Nuclear Science Week Events and sites

American Nuclear Society Student Sections are instrumental in conducting important grass-roots programming all across the U.S.

1) Chicago Local Section

Location: IIT/ McCormick Tribune Campus Center 3201 S State Street, Chicago, IL 60616

Organizer: Jeff Terry <terryj@iit.edu>

Date: Wednesday, October 22

Description: Student Workshop by invitation only. Public exhibit booth staffed by volunteers.

2) University of Illinois at Urbana – Champaign

Location: University of Illinois at Urbana

Organizer: Rizwan Uddin <rizwan@illinois.edu>

Description: working with the student chapter to have activities in that week

3) University of Utah Student Section and Alpha Nu Sigma Chapters

Location: 2 local high schools,

Organizer: Samantha P. Winkle, BSChE

Date: Thursday, October 23rd

Description: Volunteers will teach students interested in entering science and engineering careers about nuclear science.

4) Location: Natural History Museum of Utah / 301 Wakara Way, Salt Lake City, UT 84108

Organizer: Samantha P. Winkle, BSChE & University of Utah Department of Physics and Astronomy

Date: Thursday, October 23rd from 12-5pm

Description: We will have a table at the public viewing of the solar eclipse.

Volunteers will talk about how nuclear science relates to space and celestial bodies, along with some hands-on educational learning activities.

Location: University of Utah: MEB 1206

Organizer: Samantha P. Winkle, BSChE <anssc@nuclear.utah.edu>

Date: October 24th from 5pm-7pm

Description: Teacher Workshop for up to 30 science teachers across the valley from high schools and middle schools. The workshop will begin with tours of our research reactor facility and radiochemistry laboratories and end with a short course on ways to educate students about nuclear science.

Registration: <http://tinyurl.com/kczfavx>

5) Missouri University of Science and Technology Student Section

Location: Missouri University of Science and Technology Leach Theatre/ 103 Castleman Hall

400 W. 10th St. Rolla, MO 65409-1550

Organizer: Dylan Prévost/ 'dylan.prevost@mst.edu'

Date: Thursday, October 23rd

Description: Screening of Pandora's Promise with discussion

6) Northeastern Local Section

Location: EPM, Inc., 959 Concord St., Framingham, MA 01701

Organizer: Paris Karahalios, Chair – ANS Northeastern Section / parisk@triusinc.com

Date: Thursday, October 23rd

Description: ANS Northeastern Section meeting will feature MC (Mikey) Brady Rapp, ANS President as a guest speaker. The topic is the *ANS Center for Nuclear Science and Technology Information and Communications Improvement Programs*

7) North Carolina State University Student Section / NC State's Women in Nuclear Student Chapter

Location: North Carolina State University

Organizer: Lisa Marshall/ lmmarsha@ncsu.edu

Date: Wednesday, October 22 / 12:15 - 1:00 p.m.

Description: Research reactor tour (restricted to on-campus community only)

Meet in main lobby of Burlington Engineering Labs (garden side across from Withers Hall) Must walk with campus ID Sign up [here](#)

Date: Thursday, October 23 / 12:15 - 1:00 p.m.

Description: Research reactor tour (restricted to on-campus community only)

Meet in main lobby of Burlington Engineering Labs (garden side across from Withers Hall)

Must walk with campus ID Sign up [here](#)

Date: Thursday, October 23 / 4:00-5:00 p.m.

Description: *"Nuclear and Radiation Science at the University of Surrey"*

Professors Sellin & Paddy

Refreshments at 3:45 p.m. *An overview of the nuclear physics and radiation science research interests at the University of Surrey (UK) that include nuclear physics campaigns carried out at various international accelerator centers, nuclear metrology, and radiation detector development and advanced instrumentation will be given.*

Date: Thursday, October 23 / 7:00 p.m.

Description: Showing of Robert Stone's [Pandora's Promise](#)

Location: Progress Energy Lecture Hall (1202 Burlington Engineering Labs) / Best entrance off Stinson Drive

8) Georgia Institute of Technology Student Section

Location: Georgia Tech Student Center / 350 Ferst Drive, NW/ Atlanta, GA 30332-0458

Organizer: Ben Musall / benjaminmusall@gatech.edu

Date: 10/20 – 10/24/2014

Description: The *Nuclear and Radiological Engineering Program* will host a table at the student center the entire week to promote the benefits of nuclear science and technology and answer public questions.

As part of [Nuclear Science Week](#) ANS has encouraged our sections to build awareness of nuclear science and technology at the local level. Since 2010, Local and Student Sections, corporations, schools, and individuals have organized or participated in events in their communities with a common goal: to promote the benefits of nuclear science and

technology in our everyday lives. Now in its fourth year, ANS would like to thank the following sections that made the third week of October a remarkable week:

1. Chicago Local Section
2. Eastern Washington Local Section (ANS-EWS)
3. Georgia Institute of Technology Student Section
4. Idaho State University Student Section
5. Missouri University of Science and Technology Student Section
6. North Carolina State University Student Section
7. Northeastern Local Section
8. Oak Ridge/Knoxville Local Section / UT Student Section
9. Oregon State University Student Section
10. Puget Sound Local Section
11. University of Illinois at Urbana – Champaign Student Section
12. University of Sharjah Student Section
13. University of Tennessee Student Section
14. University of Utah Student Section and Alpha Nu Sigma Chapters

Through the ANS Public Information Assistance (PIA) Grant Program and the Center for Nuclear Science and Technology Information, these sections received nearly \$8,000 in cash grants and outreach materials to distribute at their events. Together, ANS organized 27 events in 14 cities, and was able to reach 2,500 youth, educators, and the general public at large.

Canada Observance:

For 2015, a major addition to the impact of Nuclear Science Week was the addition of programming within Canada, thanks to many, but principally Dr. Jason Donev, Professor of Nuclear Physicist at University of Calgary. Below are some of the programming and web pages that were available in Canada.

October 21, 2015

Fedoruk Centre presents *nuclear*FACTS research meeting and science café

SASKATOON –The Fedoruk Centre is hosting its annual *nuclear*FACTS research forum and a *nuclear*FACTS Science Café on Thursday, October 22.

Representatives from 16 supported projects will be participating in the day's events, talking about their work ranging from better ways to diagnose and treat cancer using medical isotopes, to advances in designing materials for future nuclear power plants, to determining the amounts of Greenhouse Gases produced by the uranium mining industry.

“This is a great opportunity when we can get all of the researchers supported by the Fedoruk Centre together as a community, to share ideas and report on the progress and impact of their

work,” says Neil Alexander, executive director of the Fedoruk Centre. “It also demonstrates the breadth and depth of the nuclear-related research that is going on in Saskatchewan, contributing to innovation, the creation of new knowledge and ultimately human health and well-being.”

Researchers and students will participate in a peer to peer forum during the day on Thursday to report on their research to each other and the Fedoruk Centre’s Project Advisory Committee, made up of experts in nuclear research from outside of Saskatchewan.

Thursday evening, the research teams will participate in the *nuclearFACTS* science café at TCU Place. The evening begins with a panel discussion and Q&A session, followed by a chance to meet researchers and look at displays of their work over refreshments.

WHEN: Thursday, October 22 at 7 p.m.

WHERE: Gallery B and C, TCU Place Arts and Convention Centre
35-22nd Street East, Saskatoon

Admission is free, but advance registration is encouraged using Eventbrite at <https://nuclearfacts15.eventbrite.ca>.

nuclearFACTS, a Forum for Accountability and Communities Talking *nuclear* Science, is a unique way for the public to find out more about nuclear research supported by the Fedoruk Centre from the researchers themselves.

For editors and producers:

A media availability with researchers will be held from 1 to 1:30 pm at the Candle-Span Room, Atrium Building, Innovation Place, 111 Research Drive in Saskatoon. Members of the media are also invited to attend the science café.

Dear physics teachers and other science enthusiasts,

This week is national nuclear science week. I’m posting this to encourage teachers to get their students out to different events around Canada. We’re going to be talking about the recent Nobel prize and ongoing Canadian research. Contact me if you’d like some slides for presenting to a class on Canadian nuclear science in general, or the recent Nobel Prize: I’m hosting an event here in **Calgary** Saturday Oct 24th:

<http://www.ucalgary.ca/rao/>

(You can see me talking about it on television here)

<http://globalnews.ca/video/2279384/how-you-can-take-part-in-nuclear-science-week-in-calgary-2>

At **TRIUMF in BC** Saturday Oct 24th:

Stanley Yen $E=mc^2$ and Nuclear Processes on Earth and in the Cosmos

<http://www.triumf.ca/research-program/lectures-conferences/upcoming-seminars-lectures?expand=1605>

NuclearFacts in **Saskatoon**:

Thursday, October 22, 7 p.m. TCU Place Arts and Convention Centre

<http://www.fedorukcentre.ca/docs/nuclearfacts2015.php>

Public talk in **Regina**, “From Quarks to nuclear imaging and safety applications”:
[Tuesday](#) at 7:00pm
[UR-Physics](#) LB 226, 3737 Wascana Parkway, Regina, Saskatchewan S4S0A2
<https://www.facebook.com/uofr.physics/photos/gm.427006544168825/1640688192876964/?type=3&theater>

United Kingdom Observance:

Many programs took place just prior to the actual week-long dates for NSW in England as a component of a celebration of industry and university to focus on nuclear development and business in the U.K.

2015 represented the first UK observance of Nuclear Science Week

- It was run in conjunction with the BECBC Nuclear Energy Business Opportunities Conference (NEBOC) which is was held in Cumbria, the UK’s Centre of Nuclear Excellence.
- As an inaugural observance our activity was focused on a target audience of young students from the newly established Energy Coast University Technical College.
- Two student led teams (high school age) were tasked with creating a media package focused on Cumbria’s nuclear history and heritage as well as taking a view on the present and future opportunities
- Added interest was created with an edited package to be showcased by NNL at the US observance of NSW the following week
- Activities included:
 - o A visit to the Low Level Waste Repository
 - o A visit to the Beacon Museum and in particular the Sellafield Story exhibition
 - o Masterclasses given by local media organisations
 - o 2 day media access to an event attended by over 400 delegates
 - o Interviews held with local innovators and technology companies
 - o An interview with renowned social entrepreneur Lord Andrew Mawson

The NEBOC conference was formally “held in collaboration with NSW”.

See here for more details on the conference:

<http://www.n-eboc.co.uk>

Todd Allen of INL spoke at the NEBOC event, as a way of building the links between the US and UK nuclear communities.

Adrian Bull participated in NSW in the U.S. as well with his attendance to both INL and ORNL, as well as participation in the main NSW event in Knoxville.

Organisations involved included:

Britain’s Energy Coast Business Cluster (BECBC)

**Britain's Energy Coast (BEC)
Low Level Waste Repository (LLWR)
National Nuclear Laboratory (NNL)
Energy Coast University Technical College (UTC)
Sellafield Ltd**

Student access and impacts:

NSW is pleased to continue a partnership with The National Science Teacher Association (NSTA). NSTA provided connection to their web services for streaming proceedings in Seattle. In addition, NEI created web streaming content in Washington DC. The full program of NSW 2015 events was streamed live across the web for students and citizens. This was carried on the NSW Website and NSTA site.

Sponsors and Partner organizations: National Science Week 2015 was honored to recognize many sponsors and partnering support organizations at sites around globe the U.S. Below are many corporate and foundation sponsors and partners that we gratefully recognize for their support.

**Idaho National Lab
Lockheed Martin Corp.
Sandia National Lab
NAYGN
ANS National
NEI
NSTA
U S WIN
Illinois Institute of Technology College of Science
A.I. Pierce Foundation
National Museum of Nuclear Science & History
SRS Community Reuse Organization
Nuclear Workforce Initiative
Georgia Regents University Augusta
Georgia Power
Southern Company**

SCANA Corporation
Savannah River Nuclear Solutions
Oak Ridge National Laboratory
Oak Ridge Associated Universities
National Nuclear Laboratory (UK)
Provision
CB&I AREVA MOX Services
Parsons
EnergySolutions
Aiken Technical College
Savannah River Remediation
Textron Specialized Vehicles
Babcock & Wilcox
Applied Research Center

Web site links and connections: There were literally a hundred web links at many corporate, regional, partner and museum website pages. They are too numerous to mention and we thank all that placed NSW into their website to assist in promotion and presentation.

Communications: Getting the word out about nuclear is the primary goal of NSW hence the moniker, “Get to Know Nuclear”.



Nuclear Science Week

Media Mentions, on-line, blogs: NSW was seen in many print and electronic media places from newspapers to websites and social media postings and blogs. The interest in posting was exceptional for 2015 exceeding the huge impact of 1.7m impressions during 2014 with impacts reaching 3.7 million during a ten-day period preceding, during and right after the event thanks in many ways to the larger event organizations in several new countries..

The next years for Nuclear Science Week: The Request for National Site Celebration Proposals will be in the public information in 2015 and then the RFP for the 2016 event is out for viewing and for groups to form a proposal.