



# GO NUKE!

A newsletter from the North American Young Generation in Nuclear

January 2002

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## What would we do without nuclear energy and technology?

The drawings submitted to the Third Annual NA-YGN Drawing Contest were displayed during the 2001 ANS Winter Meeting in Reno (Nevada) from November 11<sup>th</sup> – 15<sup>th</sup>. This year we had over 250 drawings from six elementary schools in four states: SGA Elementary School (Georgia), Blakeney Elementary School (Georgia), Rosewood Elementary School (South Carolina), Mill Creek Elementary School (South Carolina), Springfield Park Elementary School (Virginia) and West Middleton Elementary School (Wisconsin). The jury, formed by Dr. Gail Marcus (ANS President), Mr. Ben Rouben (Canadian Nuclear Society), Mr. Dave Modeen (Nuclear Energy Institute), Dr. Gustavo Alonso (Mexican Nuclear Society) and Prof. Mike Corradini (Wisconsin Institute of Nuclear Systems), had a hard time choosing the three winners because there were too many cool drawings. After long deliberations, the winners are:

**First Prize (\$100 USD Savings Bond, NA-YGN T-shirt & pin)**  
**Alice Leno, 10 years old**  
**West Middleton Elementary**  
**Middleton, Wisconsin**  
**Teacher: Ms. Lindberg, 5<sup>th</sup> grade**

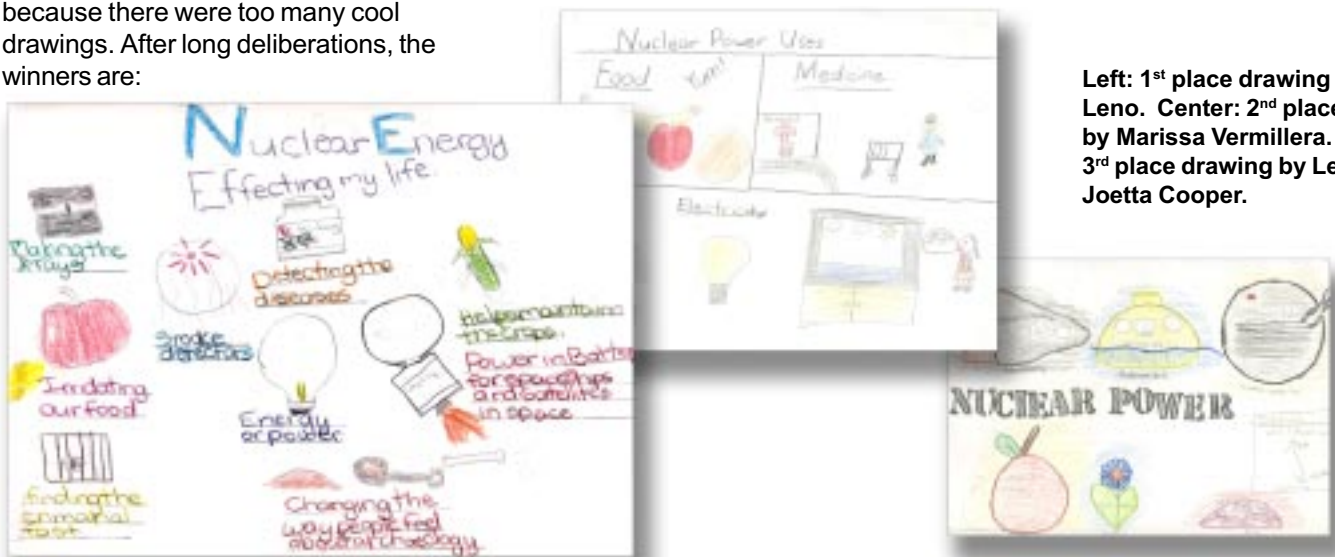
**Second Prize (\$50 USD Savings Bond, NA-YGN T-shirt & pin)**  
**Marissa Vermillera, 9**  
**Springfield Park Elementary**  
**Glen Allen, Virginia**  
**Teacher: Mrs. Yaffe, 4<sup>th</sup> grade**

**Third Prize (\$50 USD Savings Bond, NA-YGN T-shirt & pin)**  
**Le'Whitney Joetta Cooper, 9**  
**Blakeney Elementary**  
**Waynesboro, Georgia**  
**Teacher: Mrs. Summers**

In addition, the library of each winner's school will receive a collection of books and reference materials on Nuclear Science and Technology. The award ceremonies will be held in January 2002.

NA-YGN wants to thank the Wisconsin Institute of Nuclear Systems for sponsoring the Third Annual NA-YGN Drawing Contest. We also want to thank all the members of the jury for their help and for going through a large number of drawings to pick the winner. Finally, we want to thank all the NA-YGN members that supported this effort by visiting the schools, talking to the kids and their teachers about Nuclear Science and Technology, and collecting more than 250 drawings. Thank you!!!!

*By Sama Bilbao y León*



Left: 1<sup>st</sup> place drawing by Alice Leno. Center: 2<sup>nd</sup> place drawing by Marissa Vermillera. Right: 3<sup>rd</sup> place drawing by Le'Whitney Joetta Cooper.

# Shortages in the Nuclear Workforce

At the Winter 2001 ANS meeting in Reno, NV, I was invited to represent Dominion in the ANS Special Task Force on "Nuclear Workforce Shortage Issues". This committee, chaired by Ted Quinn (MDM Corp.) and Andy Klein (Oregon State University), hopes to develop solutions for this problem, and is attempting to coordinate the efforts that several sectors of the nuclear community are using to address it. The committee includes representatives from Exelon, Southern California Edison, Entergy, Stone & Webster, INPO, NRC, DOE, NEI, Argonne National Laboratory, Ohio State University, University of Michigan, and others.

Paul Lavelly, representing the Health Physics community, provided statistics to demonstrate how the workforce problem extends to all fields of nuclear science and technology, including Health Physics. The committee decided to contact other professional societies such as the Health Physics Society, the Society for Nuclear Medicine, etc. to share resources and to learn from each other's initiatives on how to tackle this problem.

Dave Modeen (NEI) summarized NEI activities during the last couple of years, which include focus groups, surveys to University students, the March 2001 Industry-University workshop and the newly created Staffing/Recruiting Task Force that will assess industry action to mitigate this problem. One of the key activities performed by NEI is a recently completed study that estimates more precisely the future needs and the actual shortage of nuclear professionals that the industry will experience over the next 10 years. NEI estimates that to maintain current nuclear capabilities (including life extension of current nuclear power plants but NOT taking into account the construction of new ones) the nuclear industry would need to hire about 11% of the pool of engineering graduates (of all specialties). Currently, we hire about 3% of them. These numbers, which show the rather dramatic recruiting needs of the nuclear industry, were received with alarm by the members of the task force.

John Gutteridge (DOE) summarized DOE efforts to address this issue and asked for suggestions on what else DOE might do to help solve this growing problem. DOE is pouring

funds into Nuclear Engineering Education Programs (Teacher Workshops, surveys to high school students), into Nuclear Engineering Research Programs (the budget for NERI, NEER, etc was increased this year), into saving University Research Reactors around the country, and into Matching Grants Programs.

Committee members agreed that the nuclear community is slowly becoming aware of this problem, and a few disjointed efforts to address it are being initiated in several places. However, the coordination of all these efforts as well as a long term strategy to recruit and retain nuclear professional are critically needed. Some interesting points were made:

- Nuclear utilities and vendors need to be a constant presence on campus; for example, they might sponsor events on a regular basis. Furthermore, they need to become a "household" name, so that working for a nuclear utility will become as appealing to students as working for "Intel" or "Procter & Gamble" or "General Motors". The example of Mr. George Hairston, CEO from Southern Nuclear, who reportedly spends 40% of his time in recruiting efforts was highly commended.
- The nuclear industry needs to realize that "Generation Xers" look for more than a high salary when planning their future. Most of them look for jobs that will allow them to "make a difference", jobs with a positive impact in the environment and in our society, with plenty of opportunity for self-growth and professional development, flexible and compatible with their dynamic and family-oriented lifestyle. These characteristics should be included in the "package" when advertising careers in nuclear.
- There is a need for a centralized "Nuclear Career Center", to post jobs and to search for jobs. Supposedly, there is a high demand for nuclear professionals, but there not too many open positions are actually posted out there. Furthermore, human resources departments need to interact better with students and job applicants. For this task it is not necessary to reinvent the wheel, but perhaps to partner with one or more of the important job databases already on the web.

Overall, I believe this is a very important initiative. In addition, the fact that the nuclear community is trying to coordinate a very serious effort to mitigate the nuclear workforce shortage problem is a clear sign of the new vitality of the field.

Finally, I would like to encourage each of you to send me ([bilbao@na-ygn.org](mailto:bilbao@na-ygn.org)) comments, suggestions or ideas you might have on this issue, and I will transmit them to the committee.

*By Sama Bilbao y León*

## GO NUKE!

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# 'Bama BEST

Members of the Plant Farley branch of NA-YGN teamed up with students from Northview High School in Dothan, Alabama to compete in the Alabama Boosting Engineering, Science and Technology (BEST) competition held at Auburn University in October. The contest theme was "Rad to the Core," and students were asked to design a robot to remove simulated nuclear fuel from a reactor core. The scenario required the robot to accomplish the feat in under 3 minutes to prevent core meltdown! Winners of the Alabama BEST competition advanced to the national Texas BEST competition, held at Texas A&M University.

NA-YGN mentors provided technical guidance to the Northview HS team in the design and building of their robot. The team adopted a Batman theme incorporating the Joker, Riddler and Cat Woman as players. Preparing for the competition required a great deal of time, effort and teamwork from students and mentors. In spite of an outage, mentors from Plant Farley found ways to dedicate time and energy to the team. NA-YGN would like to congratulate the Northview HS team for placing third at the Alabama BEST competition. Good work!

As the Plant Farley YGN Chairperson, I heard many wonderful things from the students about all the YGN mentors. I would like to



Accompanied by mentor Marcus Conner (far right), the Northview HS team stands proudly by their robot as they prepare for competition.

personally thank all the mentors for having such a great attitude about this task and representing the company in such a positive way.

Because the competition had a nuclear theme, NA-YGN took the opportunity to share with the participants some of the exciting things that we can accomplish with nuclear science and technology. NA-YGN members Chris Comfort (Southern Company) and Shannon Bragg-Sitton (University of Michigan / NASA Marshall Space Flight Center) offered a presentation on nuclear power and alternative applications of nuclear science and technology, such as medical diagnostics and therapy and space power and propulsion.

For more information about NA-YGN at Plant Farley, contact [naygnfnp@southernco.com](mailto:naygnfnp@southernco.com).

By Marcus Conner



Team members guide their robots to remove simulated fuel assemblies in one round of the competition.

**T**hese days, safety is word one! Since the September 11 terrorist attacks, our industry has been bombarded with scrutiny from the media, the public, and anti-nuclear forces. Here are some important messages to communicate when asked about the safety of our industry. It is important to reiterate that safety is stressed in every aspect of the nuclear field — such as current safety plans, safety in the face of a terrorist attack, safety in the storage of used fuel, and safety in fuel transport.

**The Nuclear Power industry has a comprehensive**

**nuclear safety process in place.** Safety is ensured at nuclear power plants in the United States according to four interlocking steps: extensive government regulations have been established to protect the public; nuclear plants are built according to designs that meet the regulations; owners are required to operate the plants according to approved specifications and abide by strict controls on changing the designs; and regulators monitor operations and compliance with regulations through resident inspectors stationed at every site.

**Nuclear plants are equipped for, and prepared to defend against, most types of attacks.** They are structurally fortified to withstand the impact of natural forces like hurricanes, tornadoes, and airborne objects up to a very substantial force. Reactors at nuclear power plants are enclosed in containment buildings made of steel and reinforced concrete up to four feet thick. Containment at nuclear power plants along the glide paths into airports are specifically designed to withstand airliner accidents. Containments at other nuclear plants not specifically designed for this event are still likely to be equally strong because of other design requirements, such as withstanding the impact of earthquakes

and other natural forces. Each nuclear plant has a well-armed security force trained to defend against armed assaults and acts of sabotage, and has a multiple barrier, defense-in-depth design to ensure against a potential release of radioactivity in case of an accident or act of sabotage.

Since September 11, companies operating nuclear plants have increased their security forces and put them on the highest state of alert. In addition, the Coast Guard, National Guard, and state police have supplemented these forces.

**While nuclear plants cannot be guaranteed to be impervious to every imaginable threat, commercial nuclear reactors are designed and constructed with that extremely remote possibility in mind.**

Design requirements with respect to aircraft impacts are tailored to each individual facility, but all nuclear reactor containment buildings are like bunkers, built of thick, steel-reinforced concrete. Inside the containment building, the reactor is encased in a steel pressure vessel up to a foot thick. This defense-in-depth safety strategy minimizes the risk of penetration from outside forces, and helps prevent the release of radioactivity in the event of an accident.

**Used fuel pools are located within the plant grounds and are protected by the same security force and electronic surveillance equipment as the rest of the plant.** Plants have in place stringent security measures to detect and repel any approach on the ground. Specially designed steel-lined pools for fuel storage are very difficult to spot from the air. These pools, located inside buildings at the plant, are designed to withstand the effects of an earthquake. The probability of a terrorist attack by an airplane is very

low because these storage facilities are not easily visible from the air. The containers in which the used nuclear fuel is stored are designed to withstand an earthquake and other natural disasters. Specifically, they will remain intact and prevent a release of radiation even if they are thrust off of the ground and bounce back down.

**A number of procedures, specifications, and regulations already in place are designed to protect containers transporting used nuclear fuel from attack as well as accident.** Used nuclear fuel is transported only along highway or train routes that have been pre-approved and pre-inspected by the U.S. Department of Transportation. Approved truck routes use highway bypasses around populated areas and avoid tunnels. Trains use alternate routes wherever possible to avoid tunnels. Trains shipping used nuclear fuel from commercial power plants in the future will likely use dedicated trains, that is, trains carrying only used nuclear fuel. The U.S. Federal Railway Administration and the individual railroad companies check the rails of a train route before shipment. The U.S. Nuclear Regulatory Commission checks all routes for law enforcement and emergency response capability as well as secure facilities for emergency stops. NRC regulations require that the

shipper notify the governor of each state on the route seven days before the trip.

If you would like additional information regarding safety at nuclear facilities, please visit NEI's website at [www.nei.org](http://www.nei.org) and click on the "Safety First" section or call Sonja Simmons at 202.739.8042, [sss@nei.org](mailto:sss@nei.org).

**By Sonja Simmons**

**Spreading the Word about Nuclear Safety**

In September 2001, the Nuclear Society of Russia organized and hosted an International Youth Seminar at the State Regional Education Center of MINATOM of Russia in the city of St. Petersburg. The Youth Seminar was held September 10 and 11, preceding an IYNC (International Youth Nuclear Congress) organizational meeting September 13 and 14. With the objective of facilitating cooperation and communication among nuclear youth in different parts of the world, young nuclear professionals and students were invited to represent knowledge and perspectives from various distinctive geographic and cultural persuasions. Representatives from Russia, countries of Eastern and Western Europe, Asia, and North America were in attendance.

During the opening session, the young generation was greeted and addressed by established industry professionals including Kurt Fischer of Framatome



**IYNC organizing committee members Elena Elaguina and Anna Markova of Russia confer with Advisory Committee member Pierre Chometon of France at the IYNC preparatory meeting that followed the youth seminar.**

ANP, Germany, and P. L. Chometon of the Nuclear Society of France. A press conference followed the opening session, and the remainder of the seminar was dedicated to presentations and discussions from the Youth Seminar participants. The first day of sessions, which included presentations from Eastern European, Western European and Russian representatives, was followed by a beautiful boat trip

around the city of St. Petersburg. The river ride included entertaining music and dancing, as well as delicious local cuisine. In addition to the obvious benefit of enjoyment and imbibing, the river boat ride provided the first opportunity for the young generation to gather and meet one another in a relaxed social setting.

## International Youth Nuclear Seminar

### East-West Nuclear Cooperation: Joining Young Generation Efforts

Presentations by the young generation participants continued on second day of the Youth Seminar, and in the afternoon about 20 seminar participants took an excursion to the Radium Institute Museum. Tour attendees and

Museum employees worked through the slight impediment of language barriers to create an enjoyable and certainly informative experience. Of interesting note is that The Radium Institute is home to St. Petersburg's first cyclotron, which was included as part of the tour. This tour stop was accompanied by a lengthy explanation of the cyclotron's history and utilization, along with a discussion of the initial efforts and program maneuvers by the Soviet Union to develop nuclear weapons. At the end of the second day of the seminar, we all looked forward to a party at the "California Grill" in downtown St. Petersburg. The mood of the party was, however,

dampened considerably by news of the hijacking terrorist attacks that had just occurred in the United States.

With the presentations completed, Seminar participants were welcomed to enjoy the excursions that had been organized and planned by our gracious hosts. Many of us enjoyed a tour through the Peterhof, which is a rebuilt

Palace once belonging to Peter the Great. This palace was mostly destroyed during World War II, but has since been rebuilt to its former beauty. Of particular magnificence are the famous fountains in the rear of the palace that produce a gravity-driven display of water streams jetting from an array of golden fixtures. In the afternoon, we had planned to visit the Leningrad Nuclear Power Plant (LNPP) for a comprehensive technical tour. Unfortunately, due to the grave occurrences in the U.S. on the previous day, the security at LNPP had been significantly heightened and the tour had to be canceled. The plant staff agreed, however, to host the seminar attendees for lunch and an open discussion on the technical, political and social aspects of the plant. A tour would certainly have been more satisfying, but we made the best of the situation and the discussion was very informative.

At the end of the week, executive team members of the International Youth Nuclear Congress took advantage of the congregation of young professionals to hold a meeting to discuss the organization and preparation for the upcoming Congress in Daejeon, South Korea April 16-20, 2002. To learn more about IYNC, please visit [www.iync.org](http://www.iync.org).

*By John Singleton*

# Student Mini-Conference in Reno

The inaugural Student Mini-Conference was held in conjunction with the ANS Winter Meeting in Reno, Nevada, on November 10 and 11. Karl Umstadter, General Chair, formed a committee of students and recent graduates to work together with ANS staff in organizing and running the meeting. The Conference included one and a half days of technical sessions, a Professional Development Workshop lunch, and a dinner banquet. Each of these events contributed to reaching the Conference objective, namely to promote professional development of college students in the nuclear field.

Attending this first-of-a-kind meeting were 100 students from 15 universities, both national and international. Graduate and undergraduate students gave a total of 45 presentations on original research and successful public outreach efforts. The areas of research reflected the wide range seen among the ANS Professional Divisions, touching on practically every field from Accelerator Applications to Thermal Hydraulics. Each presenter received constructive feedback via informal evaluation forms completed by audience members. This process also provided a mechanism by which the conference organizers could compare the talks and grant Outstanding Presentation award certificates in each subject area. From the subject area winners, overall graduate and undergraduate winners were chosen. Congratulations go to:

**Heidi Aquino, University of Nevada, Las Vegas**  
**Best Graduate Student Presentation**  
**Delayed Hydride Cracking of Cladding Materials**

**Veronica Klein, University of New Mexico, (with Ron Kensek, Sandia National Laboratory)**  
**Best Undergraduate Presentation**  
**Angular Distributions Across Boundaries in ITS Codes**

A Professional Development Workshop lunch took place between morning and afternoon sessions on day 1 of the Mini-Conference. The panel of speakers, including professionals from government, military and the industrial/commercial sectors offered pointers for students planning their



**Above: The Best Undergraduate Award is presented to Veronica Klein by General Chair Karl Umstadter and ANS Student Director Shana Browde.**



**Left: Heidi Aquino receives the Best Graduate Student Presentation award from Umstadter.**

careers in nuclear science. Following the presentations, panelists had the opportunity to intermingle with the students, to address questions, and to discuss details in their areas of expertise.

Ted Quinn, past president of ANS, was guest speaker at a dinner banquet held on Saturday evening. He encouraged students to continue in the nuclear field, citing a recent study showing that there will be an average of 4 jobs for every student graduating in nuclear science this school year.

Through the national Student Sections Committee, efforts are underway to establish a regular student technical presence at every ANS Winter Meeting. The foundation for this presence has been laid with a successful Student Mini-Conference this year.

*By Mary Lou Dunzik Gougar*

# ANS WINTER MEETING

# ANS WINTER MEETING

What is more virtuous than getting up before dawn to breath the fresh morning air and start off the day with a run through the Reno, Nevada desert area during the ANS Winter meeting? Well, quite honestly, I can think of a few things, but that didn't seem to be the case for our twenty-four brave runners who showed up at the Hilton hotel lobby on Tuesday morning, November 13th to take part in the NA YGN Fun Run.

This run was a big success from an or-

## T-SHIRT-ON-THE-RUN

ganizational point of view, because we ended up with one MORE runner than we started off with. How's that for increasing ANS membership? It also marked the inaugural NA-YGN T-shirt Exchange. The "fee" for runners entering the race was the donation of a t-shirt – the first runners back had their choice of t-shirts! To sweeten the deal, a few NA-YGN t-shirts were thrown into the mix by the NA-YGN officers!

As usual, the first ones to finish were disqualified for trying to hard. This time, the poor souls were **Eric Loewen** from INEEL in the men's race, while Eric's spouse, **Jennifer Loewen**, was the first lady to cross the finish line. There is way-too-much ambition in this marital relationship!

As usual we also asked our participants a few questions. More specifically, we inquired about the number of members NA YGN had at the time of the race, and whether the participants knew what NA YGN stands for. The answers to those questions heavily influenced the final time and ranking in the race. For the record, NA YGN stands for North American Young Generation in Nuclear, and we had 382 members the day of the race. All except one runner underestimated our membership level. I hope we hereby pleasantly surprised most of you. The one person who overestimated, **Andy Klein (Oregon State)**, very optimisti-

cally put our membership at 10,004. Needless to say, that made Andy the official winner of the race. **Kim Kearfott (Univ. of Michigan)**, is the winner amongst the ladies. The fact that there were only two women in the race (let's do better next time ladies!) and the other lady was disqualified for finishing first, can definitely be considered a weighting factor. On the other hand, Kim did receive some bonus points for her bright red "christmassy" running outfit she wore that day. Congratulations to both winners!

Finally, I would like to introduce a new concept: the NA YGN fun run honorary winner. The race director reserves the right to grant this award arbitrarily to any of the participants. This year, the honorary award goes to John Graham, who originally started the fun runs and organized them for 20 years. For those of you who wonder whether the race director is guilty of nepotism – **John Graham** being my husband – I can only say: Define the meaning of "is". Or is that a U.S. Presidential prerogative?

**Emmy Roos**  
Race Director

# EVENTS EVENTS EVENTS

## National & International Events, 2002

Feb. 3-7: **19<sup>th</sup> Symposium on Space Nuclear Power and Propulsion**, Space Technology and Applications International Forum. Albuquerque, NM. [www.unm.edu/~isnps](http://www.unm.edu/~isnps)

April 14-18: **10<sup>th</sup> International Conference on Nuclear Engineering**. Arlington, VA. [www.asmeconferences.org/icon10](http://www.asmeconferences.org/icon10)

April 16-20: **International Youth Nuclear Congress**. Daejeon, South Korea. [www.iync.org](http://www.iync.org)

April 30-May 1: **NA-YGN Annual Professional Development Workshop**. Naples, FL. For more info, contact [simmons@na-ygn.org](mailto:simmons@na-ygn.org)

May 1-3: **Nuclear Energy Assembly**, sponsored by Nuclear Energy Institute. Naples, FL. [www.nei.org](http://www.nei.org)

June 1-5: **International Nuclear Conference**. Palm Beach, Florida. For more info, contact Ralph Branscomb/Quadrex at [Quadrexusa@hotmail.com](mailto:Quadrexusa@hotmail.com)

June 2-5: **23rd Annual Conference of the Canadian Nuclear Society**. Holiday Inn on King, Toronto, Ontario, Canada. [www.cns-snc.ca](http://www.cns-snc.ca)

June 4: **NA-YGN Mini Professional Development Seminar**. Holiday Inn on King, Toronto, Ontario, Canada. (tentative). For more info, contact [mcintyre@na-ygn.org](mailto:mcintyre@na-ygn.org)

## Get Noticed!

Upcoming events and deadlines that you would like to be included in the *Calendar of Events* can be submitted at any time for posting on the web. Include the date, location, title of the event, and the event host or sponsor in an email to [gonuke@na-ygn.org](mailto:gonuke@na-ygn.org).

June 9-13: **American Nuclear Society Annual Meeting**. Hollywood, FL. [www.ans.org](http://www.ans.org)

September: **Annual Meeting of the Mexican Nuclear Society**. Ixtapa, Zihuateanejo, Mexico. For more info, contact Gustavo Alonso at [galonso@nuclear.inin.mx](mailto:galonso@nuclear.inin.mx)

## Local Chapter Events, 2002

Feb. 9: **Teacher's Workshop**. Richmond, VA. Organized by VA-ANS, VA-HPS and VA-NA-YGN. For more info, contact [billbao@na-ygn.org](mailto:billbao@na-ygn.org)

April (exact date TBA): **Joint Meeting VA-ANS, VA-NA-YGN and Trout Unlimited (TU)**. Speaker: Dr. Denis E. Beller, "Cold-water Fisheries Benefits of Nuclear Power", Richmond, VA. [local.ans.org/virginia](http://local.ans.org/virginia)



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