



**American Nuclear Society
Fusion Energy Division
December 2012 Newsletter**

Letter from the Chair	Yoda
Slate of Candidates for 2012/2013 FED Executive Committee	Cadwallader
FED Scholarship Endowment	Cadwallader
Fusion Award Recipients	El-Guebaly
News from Fusion Science and Technology Journal	Uckan
<u>Ongoing Fusion Research:</u> EPRI Fusion Study Report	
<u>International Activities:</u> US ITER Report	Sauthoff
<u>Fusion Conferences</u> Highlights of 20th ANS TOFE Highlights of ICENES-2013 2013 Symposium on Fusion Engineering (SOFE-2013)	Lumsdaine Minguez Meier
Recently Published Fusion Books	

Letter from the Chair, Minami Yoda, Georgia Institute of Technology, Atlanta, GA.

I would like to recognize Lee Cadwallader, the outgoing chair of the Fusion Energy Division (FED), for all his efforts over the last two years. In addition to serving as Past Chair, Lee is also chairing the nominating committee for the Division. On behalf of the officers of the FED, I would like to thank Lee for all his efforts to ease the transition, and for continuing to serve as our institutional memory.

I would also like to thank the organizers of the Topical Meeting on the Technology of Fusion Energy (TOFE) in Nashville, TN in August including Brad Nelson, Dave Rasmussen, Arnie Lumsdaine, Steve Combs, and their ORNL colleagues, as well as the Vanderbilt University ANS student section members who provided audio/visual support, for making the 20th TOFE a success. The proceeds from this meeting will be a major contribution towards the Division's goal of creating an endowment fund to support an annual scholarship for a student studying fusion.

We continue to make progress in fusion research despite recent budgetary and technical challenges. Based on the recent summary of the 24th IAEA Fusion Energy Conference presented by Dr. Stan Milora of Oak Ridge National Laboratories (ORNL) to the Virtual Lab for Technology (VLT), ITER deliverables are projected to peak in 2015. Japan has just completed forging the top of the TF coil case structure, and the Republic of Korea is making good progress on fabricating the vacuum vessel support structure and the stainless steel shield blocks for ITER. The first wall blanket design is making good progress; procurement for blanket components will start next year. On the inertial fusion side, the National Ignition Facility has recently completed its ignition campaign, reaching shots up to 500 TW with all of the components meeting or exceeding specifications. One of the most exciting areas of recent fusion research is materials, the topic of the keynote talk by Dr. Steve Zinkle of ORNL at the recent TOFE, and new facilities such as the International Fusion Material Irradiation Facility (IFMIF) are being developed to test materials under fusion-relevant conditions.

Finally, we should all do our best to promote the continued health of our journal, *Fusion Science and Technology* (FS&T). I would like to encourage all Division members to verify that their libraries hold a subscription to FS&T, and if not, to please ask the librarians to add our journal to their subscription list (by contacting ANS at <mailto:subs@ans.org>). If you do not have a library, then please consider taking a personal subscription. The ANS member price is \$165/year for a combined print/online subscription, with the added benefit that the online subscription gives you access to current-year issues of FS&T and to prior issues back to the late 1990s (FS&T is working on making digitized versions of FS&T dating back to the early 1980s available online). Since FS&T publishes eight issues per year, plus extra special editions, the cost per year for members is less than \$20 per issue. Given that ordering a single electronic article from FS&T typically costs \$30, having an electronic subscription could well be more cost-effective. Thank you for your support of FS&T.

Slate of Candidates for 2012/2013 FED Executive Committee, Lee Cadwallader, Idaho National Laboratory, Idaho Falls, ID.

ANS headquarters (HQ) will send an e-mail announcement about e-ballots to all 800+ members of the FED before the end of the year. Please remember to e-vote or return your ballot by postal mail if you do not have an e-mail address. The outcome of the election will be announced before the next FED Executive Committee meeting in June 2013. The FED nominating committee is always looking for fusion professionals, like those listed below, who are willing to serve the division. If you are interested in becoming active in the division, please contact any Executive Committee member.

We want to thank the members completing their terms in June 2013: Paul Humrickhouse (INL), Keith Rule (PPPL), and Mark Tillack (UCSD). We have an excellent set of fusion researchers running for these three executive committee seats in this election, including a graduate student. Their willingness to contribute their time and talents to the division is appreciated by the FED. The current Vice Chair/Chair Elect, Susana Reyes, from LLNL, is serving her two-year term of office and will become the FED Chair at the end of the ANS national meeting in June 2014, so there is no Vice-Chair on this ballot. Our Secretary/Treasurer, Stephen Combs, from ORNL, will continue in his two-year term through June 2014 as well, so this position is also not on the upcoming ballot. The immediate Past Chair, Lee Cadwallader, from INL, is now the nominating committee chair. The list of candidates for seats on the Executive Committee is:

Dr. Ahmed Hassanein, Purdue
Dr. Ahmad Ibrahim, ORNL
Dr. Kevin Kramer, LLNL
Mr. Darius Lisowski, graduate student at UW-Madison
Ms. Kelsey Tresemer, PPPL.

Members of the FED should vote for three of these five nominees.

FED Scholarship Endowment, Lee Cadwallader, Idaho National Laboratory, Idaho Falls, ID.

For the past four years, the FED has been working to endow a scholarship for a graduate student studying fusion. ANS HQ has a set of rules to follow for such endowments, and our Division treasury is growing toward the necessary \$60,000 minimum endowment required; this level of endowment will yield an annual scholarship of \$3,000. The main source of income for the FED is the proceeds from TOFE conferences, and the last several TOFE meetings have contributed to our financial goal. A special thanks also goes to Dr. Wayne Meier, who organized the 15th International Conference on Emerging Nuclear Energy Systems in 2011; this FED-sponsored meeting also contributed to our goal. If all continues to go well, the FED will be setting up a scholarship around the end

of 2013 or the beginning of 2014. Anyone wishing to make a tax-deductible, electronic contribution toward the scholarship fund should contact the Past Chair, Lee Cadwallader. His e-mail address is Lee.Cadwallader@inl.gov.

Fusion Award Recipients, Laila El-Guebaly, Fusion Technology Institute, University of Wisconsin-Madison, Madison, WI.

Fusion awards have been established to formally recognize outstanding contributions to fusion development made by members of the fusion community. The following awards (listed in alphabetical order) were available to the newsletter editor at the time of publishing this newsletter. We encourage all members of the fusion community to submit information on future honorees to the editor (elguebaly@engr.wisc.edu) to be included in future issues. The ANS-FED officers and executive committee members congratulate the honored recipients of the 2012 fusion awards on this well-deserved recognition and our kudos to all of them.

American Institute of Aeronautics and Astronautics Awards

Terry Kammash, a professor emeritus in the University of Michigan's Department of Nuclear Engineering and Radiological Sciences, received the 2012 Pioneer Award from the American Institute of Aeronautics and Astronautics' Nuclear and Future Flight Propulsion Technical Committee. **Kammash** was recognized for his "outstanding achievements, exemplary leadership, and sustained contributions to the field of aerospace engineering in advanced nuclear fusion propulsion."

ANS Awards

- **Terry Kammash** (University of Michigan) also received the "Seaborg Medal" from ANS during the winter (November 2012) meeting. The Seaborg award recognizes an individual who has made outstanding scientific or engineering research contributions to the development of peaceful uses of nuclear energy.
- **Susana Reyes** (LLNL) has been selected to receive the "2012 Mary Jane Oestmann Professional Women's Achievement Award" by ANS. The award recognizes **Reyes'** leadership in developing detailed hazard and safety analyses for both inertial and magnetic fusion facilities, including NIF and ITER, and future power reactors.

ANS-TOFE Awards

Two awards were presented at the 20th topical meeting on the Technology of Fusion Energy (TOFE), held August 27-31, 2012 in Nashville, Tennessee:

- The "Outstanding Achievement Award" was awarded to Dr. **Akio Sagara** of NIFS for his contributions to plasma-surface interactions, the Large Helical Device (LHD), and the design of commercial fusion reactors, as well as his leadership in Japanese and international activities in fusion.
- The "Outstanding Student Paper Award" was awarded to **Lauren Garrison** for her paper, "The Effects of 30 keV He Irradiation on Single Crystal Tungsten."

APS-DPP Awards

Three awards were presented by the American Physical Society (APS) to recognize a particular achievement in plasma physics research:

- Prof. **Liu Chen**, University California - Irvine received the “James Clerk Maxwell Prize for Plasma Physics” for pioneering, and seminal contributions to, the field of dusty plasmas, including work leading to the discovery of plasma crystals, to an explanation for the complicated structure of Saturn's rings, and to microgravity dusty plasma experiments conducted first on parabolic-trajectory flights and then on the International Space Station.
- Drs. **Debra Ann Callahan** (LLNL), **George Kyrala** (LANL), **Pierre Michel** (LLNL), **Robert Kirkwood** (LLNL), **Nathan Meezan** (LLNL), and **Edward Williams** (LLNL) received the “John Dawson Award for Excellence in Plasma Physics Research.” This was a team award for predicting and demonstrating the technique of laser scatter on self-generated plasma-optics gratings that enables generation and redirection of high-energy laser beams important for indirect drive inertial confinement fusion and high-power laser-matter interactions.
- Dr. **Yu-Hsin Chen** (LLNL) received the “Marshall N. Rosenbluth Outstanding Doctoral Research Thesis Award” for measurements and theory of the ultrafast, high field, nonlinear response of gases near the ionization threshold, characterization of femtosecond plasma filaments, and demonstration that femtosecond filamentation requires plasma stabilization.

EPS /ICPP Awards

The European Physical Society (EPS) conference on Plasma Physics was jointly held with the International Congress on Plasma Physics (ICPP) in Stockholm, Sweden on July 2-6, 2012. Several awards were presented at the conference:

- The prestigious EPS “Hannes Alfvén Prize” was awarded to Prof. **Eugene N. Parker** for his theoretical discovery of the transonically expanding atmosphere in cool stars as a basic phenomenon in the magnetic astrophysical cosmos and for the very high number of other fundamental results obtained by him in the theory of magnetized plasmas.
- The 2012 “Landau-Spitzer Prize” was awarded to Prof. **Sergey Anisimov** of the Landau Institute for Theoretical Physics for outstanding contributions to plasma physics ranging from fundamental plasma theory to laboratory plasmas, controlled inertial fusion and astrophysical phenomena, particularly in the areas of laser interaction with plasma, plasma dynamics and stability, compressed matter and turbulence.
- The 2012 EPS “Innovation Prize” was awarded to Dr. **Eugen Stamate** for the discovery of the modal and discrete focusing effects associated with three-dimensional plasma-sheath-lenses that contributed to ion beam extraction, mass spectrometry, control of the ion flux on substrates and the development of new sensors for plasma and sheath parameters.
- The 2012 “Young Scientist Prize” was awarded to Dr. **Ian Chapman** (Culham Centre for Fusion Energy) to recognize exceptional achievement in the study of plasma physics at a relatively junior stage of his career.

- Three “PhD Research Awards” were presented to recognize exceptional quality of work carried out by young scientists:
 - **Bart Hennen** for his thesis on “Feedback control for Magnetic Island Suppression in Tokamaks”
 - **Frédéric Pérez** for his thesis on “Study of Supra Thermal Electron Transport in Solid or Compressed Matter for the Fast-Ignitor Scheme”
 - **Jochen Waskoenig** for his thesis on “Numerical Simulations of the Electron Dynamics in Single and Dual Radio-Frequency Driven Atmospheric Pressure Plasmas and Associated Plasma Chemistry in Electro-Negative He-O₂ Mixtures.”

FPA Awards

Three awards are presented at the Fusion Power Associates (FPA) annual meeting and symposium, December 5-6, 2012 in Washington, DC:

- Dr. **B. Grant Logan** (LBNL) has been selected by the FPA Board of Directors to receive the “2012 Distinguished Career Award.” In selecting Dr. **Logan**, the FPA Board recognizes his decades of high quality contributions to fusion research and development at both the Lawrence Livermore and Lawrence Berkeley National laboratories. The Board especially notes his technical contributions to the fusion magnetic mirror program at LLNL, his many analytical assessments of potential fusion non-electric applications and his leadership of the national heavy ion fusion program while at Lawrence Berkeley National Laboratory.
- Dr. **Stephen P. Obenschain**, U.S. Naval Research Laboratory, has been selected by the FPA Board of Directors to receive the “2012 FPA Leadership Award.” In selecting Dr. **Obenschain**, the FPA Board recognizes his many scientific and technical contributions to fusion development and the leadership he has been providing to the U.S. and world inertial fusion efforts, including the leadership and vision he has been providing to planning for a next-step inertial fusion test facility.
- Dr. **Mark Herrmann**, Sandia National Laboratories, has been selected by the FPA Board of Directors to receive the “2012 Excellence in Fusion Engineering Award.” In selecting Dr. **Herrmann**, the FPA Board recognizes his many technical contributions to inertial fusion capsule design, his leadership of the Sandia high energy density physics program and his earlier contributions to magnetic fusion while at the Princeton Plasma Physics Laboratory.

IoP 2012 Glazebrook Medal

Professor **Steve Cowley**, Head of Culham Centre for Fusion Energy and CEO of the UK Atomic Energy Authority, has been awarded the “Institute of Physics' 2012 Glazebrook Medal.” The Medal is one of the Institute's annual prizes to honor physicists who are making remarkable contributions to all areas of physics, as well as physics outreach and education, and the application of physics and physics-based technologies. Professor **Cowley** receives the award for his direction of the United Kingdom's fusion energy research program at Culham and for his seminal contributions to plasma and fusion science.

Larry Foreman Award

Dr. **Bob Day** (LANL) received the “2012 Larry Foreman Award” for contributions to precision engineering, materials science and target fabrication and outstanding leadership at LANL. The award was presented at the 20th Target Fabrication Meeting, May 20-24, 2012, Santa Fe, NM.

SOFE Awards

The 27th Symposium on Fusion Technology (SOFE) held on September 24-28, 2012 in Liège, Belgium presented three awards to PhD students as an incentive for young scientists to present their work at SOFT:

- The “Best Scientific Poster Award” (based on the scientific content) presented to **Evgeniy Malitckii** (School of Engineering, Aalto University, Espoo, Finland) for poster on “Comparative Study of Hydrogen Uptake and Diffusion in ODS Steels”
- The “Best Presentation Award” (based on layout and presentation of the poster) presented to **Kenta Sasaki** (Department of Quantum Science and Energy Engineering, Tohoku University, Sendai, Miyagi) for poster on “Effect of Heat Treatment on Bend Stress Relaxation of Pure Tungsten”
- The “Most Original Poster Award” (for the originality of the content and poster) presented to **Julien André** (Service des Basses Températures, UMR-E CEA / UJF-Grenoble 1, France) for poster on “An Alternative Vacuum Pumping System for Fusion Reactors.”

News from Fusion Science and Technology (FS&T) Journal, Nermin A.

Uckan, FS&T Editor, Oak Ridge National Laboratory, Oak Ridge, TN.

During the past 12 months (from October 1, 2011 to September 30, 2012), FS&T received a total of 342 manuscripts for FS&T regular issues; plus 45 camera-ready papers for FS&T Transactions.

Of the 342 regular manuscripts, 81 were from North America, 108 from Europe (including Russia), 145 from Asia, and 8 from Others, with the following breakdown: 167 have been accepted, 95 are under review/revision, and 80 have been rejected/withdrawn. FS&T Transaction with 45 lectures was from the 10th Carolus Magnus Summer School (CMSS2011), held in Weert, The Netherlands, September 4-16, 2011.

The following dedicated issues were published during the period 10/1/11 to 9/30/12:

- 9th Tritium 2010 Proceedings – FS&T (Oct. & Nov. 2011)
- ICENES 2011 Proceedings – FS&T Transactions (Jan. 2012)
- 10th Carolus Magnus Summer School (CMSS2011) – FS&T Transactions (Feb. 2012)
- Selected papers from 1st IAEA-ITER Materials 2010 – FS&T (Feb. 2012)
- Selected papers from 15th ICFRM 2011 – FS&T (Jul./Aug. 2012).

The following issues are scheduled/planned for the remainder of 2012, 2013 and beyond:

- Selected papers from 7th Fusion Data Validation–FS&T (Nov. 2012/Jan. 2013)

- Open Magnetic Systems & Plasma Materials Interactions 2012 – FS&T Transactions (Feb./Mar. 2013)
- Selected papers from 20th IFE TFM 2012 – FS&T regular issue (Apr./May 2013)
- Selected papers from 20th TOFE 2012 – FS&T regular issues (Jul. & Aug. 2013)
- IAEA-NFRI Data Evaluation for Atomic, Molecular and Plasma-Material Interaction in Fusion – FS&T regular issue (late 2013)
- 2nd IAEA-ITER Materials Technology 2012 – FS&T regular issue (early 2014)
- Selected Lectures from 2nd Int. ITER School, Dec. 2012, India – FS&T regular issue (2013/2014)
- Selected papers from 16th ICFRM 2013 – FS&T regular issues (mid-2014).

Electronic access to FS&T is available from 1997-to-current. ANS has completed scans of pre-1997 back issues and will soon start adding these issues as soon as they determine issues/procedures related to subscriptions involving back issues. As always, tables of contents and abstracts of papers can be accessed at <http://www.ans.org/pubs/journals/fst/>. Individual and library subscribers can access the full text articles at <http://epubs.ans.org/>.

Please send your comments on FS&T contents and coverage as well as suggestions for potential future topical areas that are timely and of interest to fst@ans.org.

ONGOING FUSION RESEARCH

EPRI Fusion Study Report

The Electric Power Research Institute (EPRI) has completed a study entitled “Assessment of Fusion Energy Options for Commercial Electricity Production.” The 66-page report can be downloaded at http://fire.pppl.gov/EPRI_Fusion_Report_10-2012.pdf.

The report states:

Fusion energy options were reviewed to assess technical readiness levels for commercial electricity production for the power industry. Magnetic and inertial confinement systems, in addition to nontraditional fusion concepts, were reviewed by a technical panel of experts, based on workshop presentations by the proponents of each technology. The results are summarized in this report. The conclusion of the review is that, although significant progress is being made in many areas, commercial application is not likely for at least 30 years — if the concepts prove feasible. Recommendations are provided to focus more of this research on engineering and power applications and to engage the power industry in monitoring progress.

From the utility perspective, the production of electricity should be the main objective of a fusion development program. At present, electricity generation appears to be an add-on and not a primary objective to the basic science of the fusion development program, largely due to the challenges of developing a fusion device that produces more energy than it consumes. The following actions are recommended:

- Direct more fusion research on the engineering and operational challenges of a power plant, including how to maximize the value of the fusion power produced. More consideration should be given to the conversion of the heat of fusion to power production and the reliability of any fusion device. Consider developing more advanced and perhaps direct power conversion systems to enhance the overall efficiency of energy-to-electricity conversion.
- Identify common materials and technology needs (such as tritium production) that a fusion test facility could address to meet most of the needs for both magnetic and inertial confinement systems.
- Monitor and periodically re-evaluate the fusion programs to assess the potential for electric power production in the nearer term to identify which concepts are likely to produce tangible fusion power. At the appropriate time, do the following:
 - Create a utility advisory group to focus fusion energy research and development projects to address more utility needs, particularly in the area of operations and maintenance, and to provide input into the design of the fusion power plants.
 - Begin to consider the regulatory requirements for commercial fusion power plants in terms of establishing safety and licensing standards.

INTERNATIONAL ACTIVITIES

US ITER Report, Ned Sauthoff, US ITER Project Office, Oak Ridge National Laboratory, Oak Ridge, TN.

Recent progress on ITER includes a French decree authorizing construction, completion and occupancy of the ITER Headquarters Building and progress on other on-site buildings, agreement on most arrangements for in-kind hardware, actions aimed at recovering the construction schedule, and improvement of the integration of the ITER Organization and the Domestic Agencies.

In November, the French Ministry of Environment signed a decree authorizing construction of the ITER basic nuclear facility. This decision follows years of safety and environmental studies of ITER's construction and operational systems and plans and constitutes an important milestone that shows that a reactor-scale fusion system can be licensed for construction and potentially operated safely with acceptable environmental effects.

In October and November, the ITER Headquarters Building was completed and occupancy was achieved. The November ITER Council meeting, held in the new ITER Council meeting room, recognized the significant progress in on-site construction and the fabrication of in-kind components by the Members. The Poloidal Field Coil Building was completed and is ready for the fabrication of the largest coils that are so large that they cannot be transported and must be built on the ITER site.

Procurement arrangements representing over 80% of the total in-kind value have been signed by the ITER Organization and the Domestic Agencies. This means that technical specifications and arrangements for quality assurance, acceptance and delivery have been agreed, enabling the transfer of remaining design and fabrication responsibility from the ITER Organization to the Domestic Agencies.

More than 350 tons of niobium-tin (Nb_3Sn) strand for the toroidal field conductors have been produced by 6 ITER Members; this constitutes 75% of the total need and a major increase in worldwide production of this advanced superconducting material. 65 tons of niobium-titanium (NbTi) strand (25% of project need) has been produced.

Schedule-recovery actions have been taken in the areas of buildings, the vacuum vessel, the cryostat and the superconducting magnets. The Members are seeking to improve the construction schedule so that the exploitation of ITER can commence on-schedule to enable study of reactor-scale plasmas, burning plasmas, and reactor-relevant technologies.

Finally, the ITER Organization and the Domestic Agencies have jointly developed an improved arrangement for joint execution of the ITER project. The “Unique ITER Team” will have a structure for more effective decision-making within and between the ITER Organization and the Domestic Agencies, and for operation as an integrated team for the execution of ITER.

FUSION CONFERENCES

Highlights of 20th ANS TOFE, Arnold Lumsdaine, Oak Ridge National Lab, Oak Ridge, TN.

The 20th topical meeting on the Technology of Fusion Energy (TOFE) was held from August 27-31, 2012 at the Hutton Hotel in the West End of Nashville, Tennessee. The conference theme was “Realizing New Technologies for the Age of Fusion Energy”, and represented a chance for key scientists and engineers from around the world to gather and exchange ideas. The meeting had 185 attendees from 11 different nations, and included 96 oral presentations (in 8 plenary sessions and 14 concurrent oral sessions) and 65 posters. In the Keynote Talk, Steve Zinkle of Oak Ridge National Lab gave a comprehensive presentation on “Challenges of Developing Materials for Fusion Technology – Past, Present, and Future.” The first night of the meeting included a welcome reception with a Town Hall Meeting, moderated by Hutch Neilson of Princeton Plasma Physics Lab. The free-flowing conversation at this meeting was conducted by the distinguished panelists:

- Chuck Kessel (Princeton Plasma Physics Lab)
- Hiroshi Matsumoto (IFMIF, Japan)
- Stan Milora (Oak Ridge National Lab)
- Farrokh Najmabadi (UC-San Diego)

- Tom Todd (Culham, UK)

The plenary talks were given on the cutting edge issues in fusion technology by prominent leaders of various fusion experiments and projects:

- Rich Hawryluk – “Progress in ITER Construction”
- Paul Thomas – “Impact of Burning Plasma on Fusion Technology Development”
- John Sheffield – “Fusion: Promise, Progress, and Problems”
- Tom Todd – “Pulsed DEMO Design Assessment Studies”
- Yoshikazu Okumura – “Present Status and Achievements of Broader Approach Activities”
- Thomas Rummel – “Progress Towards Wendelstein 7-X”
- Hiroshi Matsumoto – “Fusion Technology Activities through the Broader Approach IFMIF-EVEDA Project”
- Mike Dunne – “National Ignition Facility – Status and Future Plans”
- Satoshi Konishi – “Fusion Technology Research in Japanese Universities”
- H.L. Yang – “Overview of KSTAR Results in Phase-1 Operation”
- Houyang Guo – “Progress in EAST”
- Jon Menard – “National Spherical Torus Experiment Upgrade – Status and Plans”
- Tony Taylor – “Progress in DIII-D.”

The conference banquet was held on Wednesday, August 29. At the banquet, Wayne Meier (of Lawrence Livermore) spoke in memory of Carl Henning for his contributions to fusion technology (and his past organization of three previous TOFE meetings). The Outstanding Achievement Award was presented to Akio Sagara (of the National Institute for Fusion Science, Japan) and the Outstanding Student Paper Award was presented to Lauren Garrison (of the University of Wisconsin-Madison). A tour of the Spallation Neutron Source (SNS) and High Flux Isotope Reactor (HFIR) facilities was conducted on the final day of the meeting.

The meeting proceedings will be published in a future edition of the ANS journal, Fusion Science and Technology.

The meeting was organized with the support of the ANS Oak Ridge / Knoxville section and the ANS Fusion Energy Division. A special thanks also goes to the ANS student section at Vanderbilt University, which provided graduate student support of the meeting. Meeting sponsors included Oak Ridge National Laboratory, US ITER, Princeton Plasma Physics Laboratory, Lawrence Livermore National Laboratory, and the Naval Research Laboratory. Major Tool and Machine and US ITER presented booths in the exhibit area. The meeting was co-sponsored by the Atomic Energy Society of Japan and the Canadian Nuclear Society, and in cooperation with IEEE.

Highlights of ICENES-2013, Emilio Minguez, Jose M. Perlado and Jose Martinez-Val, Institute of Nuclear Fusion (DENIM), Polytechnical University of Madrid (Spain).

The 16th International Conference on Emerging Nuclear Energy Systems (ICENES) will be held in Madrid, Spain in May 26-30, 2013 and hosted by the Institute of Nuclear Fusion (DENIM) of the Polytechnical University of Madrid (UPM).

ICENES has a long history as a venue for sharing ideas and research results on emerging nuclear energy technologies and applications. This version of ICENES will focus on topics that enhance the interest of leaders, experts and researchers in fusion and fission energy systems. The conference will cover keynote, invited and contributed oral talks and poster presentations, providing a forum for promoting nuclear advanced systems for the future in all terms.

Conference Topics

A long list of topics has been selected, covering almost any potential area of Nuclear R&D, in an attempt to convene scientists from different backgrounds to try to find points of convergence and to propose common roadmaps for the best use of the limited resources in this field.

The key topics are related to the emerging and innovative advances and applications to fusion energy: inertial, magnetic and fusion-fission hybrids.

Advances in inertial fusion experiments around the world (such as the National Ignition Facility (USA), LMJ-PETAL (France) and FIREXs (Japan)) and the present status of other facilities or projects (such as LIFE (USA), HiPER (Europe) and iLIFT (Japan)) will be presented by authorized experts from each institution. Similarly a session will be dedicated to magnetic fusion facilities, with special dedication to the ITER project and to initiatives on DEMO designs. Existing projects in different countries related to fusion-fission hybrid systems will be asked for presentations at the conference.

Another key area of interest is advanced neutron sources and acceleration driven systems due to a great active work with interesting scientific results. In a special session, experimental devices now under construction (such as MYHRRRA and the Spallation Neutron Source in Spain (Basque Country) and Europe) and applications from accelerators will be presented.

Advanced fission fuel cycles, including separation and transmutation, gather many technologies and methodologies and offer interesting results for the new generations of fission reactors, having a major connection with the waste management system as an alternative.

As in previous ICENES conferences, there will be sessions dedicated to advances in modular and small fission reactors, and to advances in technical performances, such as high conversion efficiency, improving material performances, radiation damage testing, modeling and simulations, and irradiation tests. Safety and environment will also be covered focusing on licensing of advanced nuclear energy systems and on latest

simulation and modeling tools for safety analysis.

The distinctive characteristics of nuclear energy, in all areas of research and development, provide special requirements for education and training. A special session will be organized in this conference, showing the recent trends in nuclear education and training. Detailed national and global data covering the nuclear workforce are in short supply. Recently the IAEA has launched a global Nuclear Power Human Resource Survey, intending to cover every NPP operator across the world and to collect comprehensive information that captures all of the different types of personnel that are currently applied to support operating nuclear power programs. Also, a number of educational networks have been created in different regions around the world that have experience in education and training.

In parallel to all technical sessions, a day will be dedicated to a PhD Event competition sponsored by the European Nuclear Education Network Association (ENEN), collecting the best students of the European Countries for this competition.

Call for papers

Information regarding abstract submission is available at the webpage (www.ICENES2013.org) with a deadline of January 15, 2013. Selected papers will be presented in oral, parallel sessions and poster sessions will be distributed over two days.

The ICENES-2013 conference offers unique opportunity for young students, both doctoral and postdocs, to present their work. Members of the Technical Program Committee will award prizes for best oral presentations and posters.

Sponsors

The main sponsors of the conference are DENIM, UPM, and the Spanish Foundation F2I2. It is also supported by most of the institutions of the Spanish Platform of the Nuclear R&D (CEIDEN), by the Spanish Nuclear Society, and by the Foro of the Nuclear Industry. Most of the Spanish companies have worldwide activities and besides supporting the conference, they will present their projects and latest contributions to the nuclear field.

Additional information and contacts

Madrid is a nice city for sightseeing and social activities, having pleasant weather in May with many interesting activities for participants and accompanying persons. Organizers plan to select common interesting social events and will also provide help for additional excursions.

All information can be requested by e-mail at: icenes2013@denim.upm.es. Technical questions are addressed to Prof. Perlado, Chair of the Technical Program Committee while general questions are addressed to Prof. Minguez, General Chairman of ICENES-2013.

The webpage is continuously updated with new information added on a regular basis. We suggest that you check frequently for the latest news (www.ICENES2013.org).

2013 Symposium on Fusion Engineering, Wayne Meier, Lawrence Livermore National Laboratory, Livermore, CA.

This SOFE will be held June 10-14, 2013 in San Francisco, CA, USA. SOFE is organized and sponsored by the Fusion Technology Committee of the IEEE Nuclear and Plasma Sciences Society (NPSS). The venue for SOFE 2013 will be the Stanford Court Renaissance San Francisco Hotel in the heart of the city on Nob Hill:

(<http://www.marriott.com/hotels/travel/sfosc-the-stanford-court-renaissance-san-francisco-hotel/>). ANS Fusion Energy Division members will remember this as the site of the successful TOFE-2008 meeting.

LLNL is the local host and organizer with Dr. Wayne Meier serving as the Conference Chair. Dr. Hutch Neilson of PPPL is chairing the Technical Program Committee.

Registration and abstract submission for the 25th Symposium on Fusion Engineering (SOFE) opens on December 10, 2012 and abstracts are due by February 1, 2013. Instructions are found on the conference website: www.SOFE2013.org. ANS members will receive the IEEE member registration rate.

RECENTLY PUBLISHED FUSION BOOKS

M. Kikuchi, K. Lackner and M. Tran, Fusion Physics

<http://www-pub.iaea.org/books/IAEABooks/8879/Fusion-Physics>.

Weston M. Stacey, Fusion Plasma Physics - Second Edition

ISBN: 978-3-527-41134-4. Available at:

<http://www.wiley-vch.de/publish/en/books/bySubjectPH00/ISBN3-527-40586-0/?sID=iq242c4f6b5b5g32mlao7592q6>

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