ANS Conference

Tritium 2016

April 17-22, 2016
Charleston Marriott
Charleston, South Carolina
United States

11th International Conference on Tritium Science & Technology

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Publication of the Program and Proceedings was provided by a grant from the United States Department of Energy Office of Fusion Science.

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TRITIUM TECHNICAL SESSIONS BY DAY

TRITIUM TECHNICAL PAPERS

Letter From the Mayor of Charleston

City of Charleston

JOHN J. TECKLENBURG
MAYOR

Welcome to the City of Charleston!

On behalf of the citizens of the City of Charleston, I extend a warm Southern welcome to the participants of the 11th International Conference on Tritium Science and Technology. As time allows, we hope that you will explore the rich history of Charleston.

Charleston South Carolina, founded in 1670, is defined by its cobblestone streets, horse drawn carriages and pastel pre-Civil-War-era houses, particularly in the bustling French Quarter and Battery areas. The Battery promenade and Waterfront Park both overlook Charleston Harbor, while Fort Sumter, a Federal stronghold where the first shots of the Civil War rang out, lies across the water.

The Charleston area is comprised of many historic houses, churches, and public buildings that are still in daily use. We are proud that Charleston has been voted #1 Best U.S. City by Conde' Nast Traveler Readers' Choice Awards for the past five years.

With my very best wishes for an enjoyable and successful conference,

I am Most sincerely yours,

John J. Tecklenburg

Letter From General Chair

TRITIUM 2016

11th International Conference on Tritium Science & Technology

April 17-22, 2016 • Charleston, SC • Charleston Marriott

GENERAL CHAIR
Dr. Robert P. Addis
(803) 725-3325
addis@tritium2016.org

TECHNICAL PROGRAM CHAIR
Dr. James E. Klein
(803) 725-4203
klein@tritium2016.org

PUBLICATIONS CHAIR
Dr. Kevin R. O'Kula
(803) 502-9620
kevin.okula@aecom.com

Dear Colleagues,

On behalf of the National Organizing Committee, the Technical Program Committee, the International Steering Committee, our corporate exhibitors and conference supporters, we welcome you to Charleston South Carolina and the 11th International Conference on Tritium Science and Technology (Tritium 2016).

Tritium 2016 has been organized by the American Nuclear Society and is being hosted by the Savannah River National Laboratory. The Technical Program Committee, whose membership is one third from Asia, one quarter from Europe and the remaining 40% from North America, almost equally from the US and Canada, has provided a strong technical program.

The conference is being supported by a broad spectrum of corporate leaders who have enabled the conference to provide, to registered conference attendees and spouse/guests, an ample supply of meals and breaks. These include a welcome reception Sunday night, a dinner cruise off Charleston Tuesday evening, a banquet Thursday evening, lunches Monday, Tuesday and Thursday, as well as breakfasts and breaks each day. The publication of the Conference Program and the peer reviewed papers in the ANS Journal Fusion Science and Technology is provided by a grant from the U.S. Department of Energy, Office of Fusion Energy Sciences. We are grateful to these corporate and government leaders who are furthering tritium science and technology.

This conference series has a 36-year history starting with the American Nuclear Society national topical meeting Tritium Technology in Fission, Fusion and Isotopic Applications held in 1980 in Dayton, Ohio. Since then it has been held an additional nine times, rotating between North America, Europe and Asia approximately every three years. The objective of the conference is to provide a forum for an exchange of information on science, technology, engineering, and general experience in the safe and environmentally sound handling of tritium for fusion, fission, pharmaceuticals, and other isotopic applications.

We also welcome you to Charleston, founded in South Carolina in 1670; she is one of the grand southern ladies of American cities. Located in the deep-south, Charleston has a long history of Ante-bellum plantations, Revolutionary and Civil War related sites and artifacts. It has a flourishing artistic community, and its cuisine is delightful. Charleston is somewhat similar to Nice, France, where the last conference was held, in that it retains the charms of a bygone era, yet is fresh and ready for business today. We hope you and or your spouse/guest will avail yourself of the charms of this gem of the South during your stay, but do attend the meeting!

We wish you a productive and enjoyable conference.

Regards,
Robert Addis
General Chair, Tritium 2016

Letter From Technical Program Chair

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11th International Conference on Tritium Science & Technology

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kevin.okula@aecom.com

Dear Colleagues,

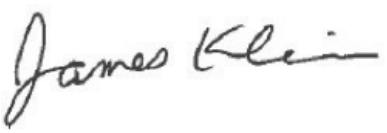
On behalf of the Technical Program Committee, it is our pleasure to welcome you to the 11th International Conference on Tritium Science and Technology (Tritium 2016), in Charleston, SC USA, from April 17 – 22, 2016. The International Conference on Tritium Science and Technology brings together the world experts in tritium science and technology to report on technical progress in a number of areas. This conference continues the tradition of a high quality forum for exchange of scientific, technological, and engineering information related to tritium which is only surpassed by the next International Conference on Tritium Science and Technology!

We are departing from tradition of recent conferences by having parallel oral sessions. Feedback from funding organizations has come back loud and clear: likelihood to attend increases greatly if making an oral presentation. The majority of 247 abstracts submitted were from international participants so parallel oral sessions were needed to maximize conference participation. Simultaneous sessions were limited to two and attempts were made to minimize overlap or competing interests of theses sessions. Strategic use of conference space will maximize social interactions between conference participants, exhibitors, and sponsors. We hope this "experiment" with parallel sessions is an acceptable compromise for greater conference participation and the inclusion of more published manuscripts in special editions of Fusion Science and Technology.

The high quality of the technical program is reflected by the leadership and assistance of members of the Technical Program Committee. The committee members, respected leaders in the tritium community, screened all abstracts to make the difficult decisions of selecting the oral presentations for the conference. Committee members balanced technical content with representation between various research organizations located throughout the world. It is believed the best technical program was created thanks to the help and support of these committee members.

In closing, we encourage you to interact and participate with the tritium community attendees during the program presented this week. We hope that when you leave, you will have many great ideas for future research and collaborations to explore before the next conference. Again, welcome to Tritium 2016! We welcome your feedback as you enjoy the conference.

Sincerely,



James Klein
Technical Program Chair of Tritium 2016

National Organizing Committee

11th International Conference on Tritium Science and Technology

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Robert P. Addis
Savannah River National Laboratory

ASSISTANT GENERAL CHAIR
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TECHNICAL PROGRAM CHAIR
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& SRS TOURS
Rosalind H. Blocker
Savannah River National Laboratory

Technical Program Committee

11th International Conference on Tritium Science and Technology

NAME	ORGANIZATION	COUNTRY
Jim Klein (Chair)	SRNL	USA
Paul Cloessner	SRNL	USA
Walter Shmayda	Univ. of Rochester, LLE	USA
David Demange	KIT	Germany
Karine Liger	CEA	France
Christian Gisolia	CEA	France
Alexey Golubev	ISC	Russia
Sam Suppiah	CNL	Canada
Hugh Boniface	CNL	Canada
Armando Antoniazzi	Kinectrics Inc.	Canada
Sei-Hun Yun	NFRI (National Fusion Research Institute)	South Korea
Kyu Min Song	KHNP (Korea Hydro and Nuclear Power)	South Korea
Satoshi Fukada	Kyushu University	Japan
Yasuhisa Oya	Shizuoka University	Japan
Satoshi Konishi	Kyoto University	Japan
Takumi Hayashi	JAEA	Japan
Clark Snow	SNL (Sandia National Laboratory)	USA
Lee Cadwallader	INL	USA
Shuming Peng	CAEP	China
Dario Castiglione	AWE	UK
Kimberly Burns	PNNL	USA

International Steering Committee

11th International Conference on Tritium Science and Technology

2015 MEMBERS	REPRESENTING
Robert Addis	(SRNL)* US
Walter Shmayda	(Rochester) ICF
Christian Grisolia	(CEA)* EU
Manfred Glugla	(ITER) ITER
Beate Bornchein	(KIT) EU
Sam Sappiah	(AECL) Canada
Arkadiy Yakhimchuk	(RFNC) RU
Shuming Peng	(INPC) CN
Prof. Yuji Hatano	(U. Toyama)* JA
Toshihiko Yamanishi	(JAEA)* JA
Scott Willms	(ITER/LANL) Chair

Schedule at a Glance

Monday, April 18

8:00 am-10:00 am	Session 1. Opening and Plenary
10:20 am-12:20 pm	Session 2. Operating and Tritium Facilities
1:40 pm-3:00 pm	Session 3. Tritium Facility Developments
3:20-5:20 pm	Session 4A. Tritium Interaction with Materials: Hydride Formers
3:20-5:20 pm	Session 4B. Tritium Confinement and Safety: Design Considerations
5:20-7:00 pm	Session 5. Poster Session 1
7:00-9:00 pm	International Steering Committee Meeting (Opal Two)

Tuesday, April 19

8:00 am-10:00 am	Session 6A. Tritium Interaction with Materials: Metals—I
8:00 am-10:00 am	Session 6B. Tritium Decontamination and Waste Management
10:20 am-12:20 pm	Session 7A. Tritium Interaction with Materials: Metals—II
10:20 am-12:20 pm	Session 7B. Tritium Processing: Use of Zeolites
1:40 pm-3:00 pm	Session 8A. Gas Phase Detritiation
1:40 pm-3:00 pm	Session 8B. Tritium Storage
3:20-5:00 pm	Session 9A. Tritium Facilities: Operations and Maintenance
3:20-5:00 pm	Session 9B. Tritium Processing, Purification, and Separations
5:00-6:20 pm	Session 10. Poster Session 2

Wednesday, April 20

8:00 am-10:00 am	Session 11A. Liquid Phase Detritiation
8:00 am-10:00 am	Session 11B. Tritium Biological Effects
10:20 am-12:20 pm	Session 12A. Tritium Interaction with Materials: Reactor Materials
10:20 am-12:20 pm	Session 12B. Tritium Breeding and Extraction—I

Thursday, April 21

8:00 am-10:00 am	Session 13A. Gas Phase Tritium Measurements
8:00 am-10:00 am	Session 13B. Tritium Environmental Effects
10:20 am-12:20 pm	Session 14A. Liquid Phase Tritium Measurements
10:20 am-12:20 pm	Session 14B. Tritium Breeding and Extraction—II
1:40 pm-3:00 pm	Session 15A. Future Tritium Facility Planning
1:40 pm-3:00 pm	Session 15B. Tritium Pumping
3:20-5:00 pm	Session 16A. Other Tritium Topics
3:20-5:00 pm	Session 16B. Tritium Confinement and Safety
5:00-6:20 pm	Session 17: Poster Session 3
5:30-7:00 pm	Banquet Reception
7:00-9:00 pm	Conference Banquet

Friday, April 22

8:00 am-9:40 am	Session 18. Near-Term, New Tritium Capabilities
10:00 am-11:00 am	Session 19. Panel Discussion: Progress in Tritium Standards and Regulation
11:00 am-12:00 pm	Session 20. Closing Ceremony

Conference Information

REGISTRATION HOURS

Location: Crystal AB Promenade

Sunday, April 17	3:00pm-6:00 pm
Monday, April 18	7:30 am-1:00 pm 3:00 pm-6:00 pm
Tuesday, April 19	7:30 am-1:00 pm 3:00 pm-6:00 pm
Wednesday, April 20	7:00 am-1:00 pm
Thursday, April 21	7:30 am-1:00 pm 3:00 pm-6:30 pm
Friday, April 22	7:30 am-1:30 pm

SPEAKER INFORMATION

Speakers for each day of the Tritium 2016 should attend the Speaker Breakfast that morning so they can transfer their talk to a computer for presentation later that day. Please bring Power Point files on a USB drive for transfer (bring a PDF version as back-up). Bring short biographical sketch (one paragraph maximum) for introduction by the Session Chairs. Please report to the Session room at least 15 minutes before the start of the session. Please sit near the front of the room near the Session Chairs to facilitate communications. Non-plenary presentations should be no longer than 15 minutes; each paper will have 2-5 minutes for questions at the end.

SPEAKER READY ROOM

Location: Opal Two

Monday, April 18	7:00 am-5:00 pm
Tuesday, April 19	7:00 am-5:00 pm
Wednesday, April 20	7:00 am-12:00 pm
Thursday, April 21	7:00 am-5:00 pm
Friday, April 22	7:00 am-10:00 am

SPEAKER BREAKFAST

Location: Opal Two

Monday, April 18	7:00 am-8:00 am
Tuesday, April 19	7:00 am-8:00 am
Wednesday, April 20	7:00 am-8:00 am
Thursday, April 21	7:00 am-8:00 am
Friday, April 22	7:00 am-8:00 am

EXHIBITS Location: Crystal AB and CD Promenades

Please set up Exhibit booths between 12:00 pm and 4:00 pm on Sunday, April 17. The official opening of the exhibit area is Monday morning, April 18. Booth removal should be planned for Wednesday, April 20, no earlier than 12:00 pm. We thank Tritium 2016 Exhibitors for their support.

POSTERS SET-UP Location: Crystal DEF

Monday April 18

Posters can be put up during lunch (12:30 pm-1:30 pm) or the afternoon break (3:00 pm-3:20 pm) and must be in place by 3:20 pm Monday. Monday posters must be removed Tuesday by the end of the morning break (10:20 am).

Tuesday April 19

Posters can be put up during lunch (12:30 pm-1:30 pm) or the afternoon break (3:00 pm-3:20 pm) and must be in place by 3:20 pm Tuesday. Tuesday posters must be removed Thursday by the end of the morning break (10:20 am).

Thursday April 21

Posters can be put up during lunch (12:30 pm-1:30 pm) or the afternoon break (3:00 pm-3:20 pm) and must be in place by 3:20 pm Thursday. Thursday posters must be removed Friday by the end of the morning break (10:20 am).

Conference Information

ATTENDEE MEALS

Sunday, April 17
7:00 pm-9:00 pm
Opening Reception - Courtyard

Monday, April 18
7:00 am-8:00 am
Continental Breakfast - Crystal CD Promenade

10:00 am-10:20 am
& 3:00 pm - 3:20 pm
Coffee Breaks - Crystal Promenade

12:30 pm-1:30 pm
Lunch - Emerald

Tuesday, April 19
7:00 am-8:00 am
Continental Breakfast - Crystal CD Promenade

Tuesday, April 19
10:00 am-10:20 am & 3:00 pm - 3:20 pm
Coffee Breaks - Crystal CD Promenade

12:30 pm-1:30 pm
Lunch - Crystal CD Promenade

Wednesday, April 20
7:00 am-8:00 am
Continental Breakfast - Crystal CD Promenade

10:00 am-10:20 am
Coffee Breaks - Crystal CD Promenade

Thursday, April 21
7:00 am-8:00 am
Continental Breakfast - Crystal CD Promenade

Thursday, April 21
10:00 am-10:20 am & 3:00 pm - 3:20 pm
Coffee Breaks - Crystal CD Promenade

12:30 pm-1:30 pm
Lunch - Crystal CD Promenade

5:30 pm-7:00 pm
Banquet Reception - Crystal Promenade

7:00 pm-9:00 pm
Conference Banquet - Crystal Ballroom ABC

Friday, April 22
7:00 am-8:00 am
Continental Breakfast - Crystal CD Promenade

9:40 am-10:00 am
Coffee Breaks - Crystal CD Promenade

DINNER CRUISE: TUESDAY, APRIL 19

Dinner Cruise on the SpiritLine Cruise Ship "Lowcountry"

Bus departure from the Marriott Charleston is scheduled for 6:45 pm. Cruise is from 7:30 pm to 9:30 pm.

Join other Tritium 2016 Conference attendees for a relaxing cruise around the Charleston Harbor. Sites that we will see during the cruise are Castle Pinckney, Charleston Battery, the Aircraft Carrier USS Yorktown, the iconic Arthur Ravenel Bridge over the Cooper River, and the historical landmark Fort Sumter (which received the first shots of the U.S. Civil War, April 14, 1861).

Enjoy the sites while sipping a cool drink and enjoying a menu of South Carolina BBQ and other fixins', prepared especially for the event. No cost – we are grateful for conference supporters for fully defraying the cost of this exceptional dinner cruise.

TECHNICAL TOURS: WEDNESDAY, APRIL 20

Savannah River Site

Bus departure from Marriott Charleston at 9:30 am, with the tour scheduled to conclude by 4:30 pm. Return to hotel tentatively by 9:00 pm. The tour fee includes a box lunch, and will stop on the return trip for an on-your-own dinner at 5:00 PM (Miller's Bread Basket, Blackville, SC). Dress in comfortable clothing with closed-toe shoes (required). Limited to 45 attendees, but currently sold out - See Conference desk for any change in this status.

The Savannah River Site (SRS) is a key U.S. Department of Energy industrial complex responsible for environmental stewardship, environmental cleanup, waste management and disposition of nuclear materials. On your tour of this 310-square-mile site, you'll discover the patriotic history of the Site's beginnings and the important role that SRS continues to play in addressing the nation's most challenging issues. You'll experience the vast infrastructure and facilities that continue to meet national security needs, while maintaining the highest possible safety and security standards. And, you'll hear about the expertly engineered processes in place to remediate and protect the environment. Primarily, however, you will learn how SRS contributes to making the world a safer place.

CHARLESTON AREA TOURS

Technical sessions are not scheduled for Wednesday afternoon. Instead, this midway point in the Conference is available as your own free time. We suggest that you consider the recreational and cultural opportunities available in this area.

Individual and group tour possibilities are numerous in the Charleston and surrounding area. See the Marriott Charleston concierge for more information, and the schedule for the free shuttle bus to cultural, Charleston Battery and other districts.

Technical Sessions: Monday, April 18

1 - Opening and Plenary

Location: Crystal Ballroom ABC
8:00 am-10:00 am

1-1 8:00 am
Welcome and Introduction
Cochairs: Robert Addis (SRNL), Steve Xiao (SRNL), James E. Klein (SRNL), John Tecklenburg (Mayor of Charleston), Terry Michalske (SRNL), Scott Wilms (ISC),

1-2 8:40 am
Preparation of and Upgrades to the Active Gas Handling System for the Planned JET TT and DT Campaigns
Robert Smith, invited, John Tecklenburg, Terry Michalske, Scott Wilms, Robert Addis, James Klein

1-3 9:20 am
Tritium Activities at the University of Rochester's Laboratory for Laser Energetics
W. T. Shmayda, M. D. Wittman, J. L. Reid, and R. F. Earley

2 - Operating and Tritium Facilities

10:20 am-12:20 pm
Location: Crystal Ballroom ABC
Cochairs: Masashi Shimada (INL), David Demange (KIT), Tukumi Hayashi (JAEA)

2-1 10:20 am
Fifteen years of Operating in a Tritiated Waste Treatment Nuclear Facility
Christophe Douche, S. Rochefort, J. Avenet, A. Arseguel, O. Leagaie

2-2 10:50 am
Research Plan of Fusion Fuel Cycle and Related Tritium Science in Korea
Ki Jung Jung, Sei-Hun Yun, Hongsuk Chung, Kyu-Min Song

2-3 11:20 am
Review of the TLK Activities Related to Water Detritiation, Isotope Separation Based on Cryogenic Distillation and Development of Barriers Against Tritium Permeation
Ion Cristescu, A. Bükki-Deme, H. Dittrich, N. Gramlich, R. Grösle, F. Krammer, N. Lohr, C. Melzer, F. Rehlinghaus, P. Schäfer, Stefan Welte

2-4 11:50 am
Overview of Fusion-Related Tritium Research in Japanese Universities
Yuji Hatano, Yasuhisa Oya, Satoshi Konishi, Satoshi Fukada, Akio Sagara

3 - Tritium Facility Developments

1:40 pm-3:00 pm
Location: Crystal Ballroom ABC
Cochairs: Walter T. Shmayda (Univ of Rochester), B. Bornschien (CAEP), Ion Cristescu (KIT)

3-1 1:40 pm
Development of Tritium Science and Technology in INPC
Shuming Peng, Xiaosong Zhou, Xiaojun Chen, Zhilin Chen, Heyi Wang

3-2 2:00 pm
Cernavoda Tritium Removal Facility—Evolution in TRF Design
L. Stefan, N. Trantea, A. Roberts, S. Strikwerda, A. Antoniazzi, D. Zaharia

3-3 2:20 pm
The Five Phases—The Way to Standard Tritium Operation of KATRIN
Beate Bornschein, Uwe Besserer, Markus Steidl, Michael Sturm, Kathrin Valerius and Jürgen Wendel

3-4 2:40 pm
Water Detritiation System for ITER—Evaluation of Design Parameters
Hugh Boniface, Nirmal Gnanapragasam, Donald Ryland, Sam Suppiah, and Alex Perevezentsev

4A - Tritium Interacation with Materials: Hydride Formers

3:20 pm-5:20 pm
Location: Crystal Ballroom ABC
Cochairs: Clark Sheldon Snow (SNL), Xiaosong Zhou (Chinese Academy), Satoshi Fukada (Kyushu Univ)

4A-1 3:20 pm
Tritium and ^{3}He in $ErT_{2-x}He_x$
Clark S. Snow, James F. Browning

4A-2 3:40 pm
^{3}He Release, ^{3}He Retention and Structural Evolution in Ti, Er and Zr Tritides: Tritium Content, Phase, Microscopic Structure and Aging Effects
X.S. Zhou, G.J. Chen, W. Ding, W.D. Wang, S.M. Peng, X.G. Long, J.H. Liang

Technical Sessions: Monday, April 18

4A - Tritium Interacation with Materials: Hydride Formers

3:20 pm-5:20 pm

Location: Crystal Ballroom ABC

Cochairs: Clark Sheldon Snow (SNL), Xiaosong Zhou (Chinese Academy), Satoshi Fukada (Kyushu Univ)

4A-3 4:00 pm
Release of Radiogenic Helium-3 from Uranium Tritide
J. Northall and J.P. Knowles

4A-4 4:20 pm
Effects of Grain Morphology on Aging Properties of Erbium Tritide Film
Wang Weidu, Zhou Xiaosong, Ding Wei, Peng Shuming, Long Xinggui, Liang Jianhua, Cheng Guijun, Liu Jinhua, Chen Jin, Liu Qiong

4A-5 4:40 pm
Electron Microscopy of Helium Bubbles in a Palladium Alloy
David B. Robinson, Mark R. Homer, Joshua D. Sugar, E. Lynn Bouknight, Kirk L. Shanahan

4A-6 5:00 pm
Hydrogen Isotope Effect on Getter Rate
Bruce Schmitt, Monte Elmore, Ed Love, Kim Burns

4B - Tritium Confinement and Safety: Design Considerations

3:20 pm-5:20 pm

Location: Crystal Ballroom DEF

Cochairs: Satoshi Konishi (Kyoto Univ), M. S. Lyttle (ORNL), Nicephore Bonnet (Kurion)

4B-1 3:20 pm
Tritium Challenges and Plans for ITER Pellet Fueling and Disruption Mitigation Systems
M.S. Lyttle, L.R. Baylor, R.E. Battle, S.J. Meitner, D.A. Rasmussen, J.M. Shoulders

4B-2 3:40 pm
Preliminary Design of a Tritium Control System for Fluoride-Salt-Cooled High-Temperature Reactors
Xiao Wu, David Arcilesi, Xiaodong Sun, Richard Christensen, Piyush Sabharwall

4B-3 4:00 pm
Tritium Constraints and Strategy for the Fusion Deployment
Satoshi Konishi, Shutaro Takeda, and Ryuta Kasada

4B-4 4:20 pm
Use of TAS in Assessment on Tritium Self-sufficiency, Resource Sustainability and Radioactive Safety for Fusion Reactor
Muyi Ni, Baojie Nie, Jieqiong Jiang, Yican Wu, FDS Team

4B-5 4:40 pm
Estimation of Tritium Release from LLCB TBM & Its Ancillary Systems and Tritium Management in Different Locations of ITER
Priyanka Brahmbhatt, Amit Sircar, Rudreksh Patel, E. Rajendra Kumar, Sadhana Mohan, Kalyan Bhanja

4B-6 5:00 pm
Estimation of Tritium Permeation Rate to Cooling Water in Fusion DEMO Condition
Kazunari Katayama, Youji Someya, Kenji Tobita, Hirofumi Nakamura, Hisashi Tanigawa, Makoto Nakamura, Nobuyuki Asakura, Takumi Chikada, Yuji Hatano, Satoshi Fukada

Technical Sessions: Monday, April 18

5 - Poster Session 1

5:20 pm-7:00 pm

Location: Crystal Ballroom DEF

Cochairs: Anita S. Poore (SRNL), Melissa Golyski (SRNS), Benton Randall (SRNL)

Tritium Confinement and Safety

5-01

Design Considerations for Tritium Handling Systems: An Engineering Approach

Benjamin Huffer

5-02

Model for the Production, Diffusion, and Containment of Tritium in PWRs

N. Bonnet, G. Bonhomme, Y. Iwasaki, D. Carlson, J. Raymont

5-03

Dynamic Tritium Fuel Cycle Analysis for Fusion Reactor Based on System Dynamics Model

Baojie Nie, Muyi Ni, Jieqiong Jiang, Yican Wu, FDS Team

5-04

The Status of the Tritium Transport Libraries in EcosimPro

C. Moreno, A. Rueda, J. Serna, F.R. Urgorri, E. Carella, J. Castellanos

Tritiated Water Processing

5-05

Conception of Multi-Purpose Heavy Water Detritiation Plant

S.D. Bondarenko, I.A. Alekseev, O.A. Fedorchenko, K.A. Konoplev, V. Vasyanina

5-06

Theoretical Analysis for Setting up a Mixed Catalytic Packing that Equips a Catalytic Isotopic Exchange Column

Anisia Bornea, Marius Zamfirache, Ioan Stefanescu

5-07

Detritiation and Tritium Storage Technology Development

Hongsuk Chung, Yeanjin Kim, Kwangjin Jung, Seungwoo Paek, Sei-Hun Yun, Do-Hee Ahn

Tracer Techniques

5-08

Application of Imaging Plate Technique and Beta-Ray-Induced X-ray Spectrometry to Measurements of Tritium Distributions in Divertor Tiles Used in JET ITER-Like Wall Campaigns

Yuji Hatano, Kazuya Yumizuru, Seppo Koivuranta, Jari Likonen, Jussi Ikonen, Masao Matsuyama, JET contributors

5-09

Using Dye Tracer Studies to Characterize Tritium in Groundwater; No News can be Good News

Nadia Glucksberg, Kenneth Alepidis

5-10

Geotritium: Implications of DeP Weak Interaction Fusion in Magmatic Systems

Thomas E. Ward

Tritium Decontamination and Waste Management

5-11

Safe Decommissioning for Tritium Storage U Bed

Gui-Ping Dan, Wen Wei, Zhong-Sheng Ma, Jun-Hui Zeng, Zhao-Yi Tan

5-12

Isotope Exchange of Two $LaNi_{4.25}Al_{0.75}$ Hydride Process Beds

Greg Staack

5-13

^{14}C and ^{3}H Determination in Irradiated Graphite from the Thermal Column of the VVR-S Research Reactor

V Fugaru, C Postolache

5-14

Safety Aspects of an Interim Storage Facility for Tritiated Waste from Nuclear Fusion Facilities

F. Derasse, D. Canas, C. Decanis, J. Pamela

Technical Sessions: Monday, April 18

5 - Poster Session 1

5:20 pm-7:00 pm

Location: Crystal Ballroom DEF

Cochairs: Anita S. Poore (SRNL), Melissa Golyski (SRNS), Benton Randall (SRNL)

Tritium Supply, Transport, and Storage

5-15

Romanian Tritium for Nuclear Fusion

Richard J. Pearson, William J Nuttall, Olivia Comsa, Liviu Stefan

5-16

Effect on the Secondary Buffer Vessel from the Upper Supplying Failure in Multi-Feed System

Sei-Hun Yun, Min Ho Chang, Hyun-Goo Kang, Dong You Chung, Seungyon Cho, Hyeon Gon Lee, Ki Jung Jung, Hongsuk Chung, Kyu-Min Song, Euy Soo Lee, In-Beum Lee, Jae-Uk Lee, Byeong Eon Park

Tritium Facilities and Operations

5-17

HYSYS/ASPEN+ Advanced Tritium Transfer Modelling Tools for ITER/DEMO Plant Systems

J. M Nougués, J.A. Feliu, G. Campanya, O. Osychenko, L. Batet, L. Sedano

5-18

Operation Experience on Safety System of Tritium Process Laboratory for 28 Years in Japan Atomic Energy Agency

R. Kurata, M. Yamada, T. Suzuki, H. Nakamura, Y. Iwai, K. Isobe, and T. Hayashi

5-19

CODAC Prototyping for Dynamic Tritum Mass-Balance Control Demostration in Tritium Breeding Systems

D. Marchante, L. Batet, R. Granados J. Abellà, S. Colomines, L. Sedano

5-20

Design of Tritium Handling Facility for Tests of ITER SDS Components

Kyu-Min Song, Byung-Wook Ko, Soon Hwan Son, Sei-Hun Yun, Min Ho Chang, Hyun-Goo Kang, Ki-Jung Jung

Other Tritium Topics

5-21

The structure Design of Producing Tritium Blanket for Fusion-Fission Hybrid Reactor Driven by Z-Pinch

Zeng Herong, Liu Zhiyong, Shaohua Wang

5-22

Finite Element Simulation for Liquid Deuterium-Tritium Inside a Capsule with Fill-Tube

Xin Huang, Xiaosong Zhou, Mingming Yu, Chengwei Wen, Shuming Peng

5-23

Analysis of Tritium Migration and Proposed Capture/Removal Methods in Fluoride Salt-Cooled High-Temperature Reactors (FHRs)

Floren Rubio, Bryan Wallace, Edward D. Blandford

Tritium Biological and Environmental Effects

5-24

Using Atmosphere-Forest Measurements to Examine the Potential for Reduced Downwind Dose

Brian J. Viner, Sydney Goodlove

5-25

Uncertainties in Dynamic Modelling of Environmental Tritium Transfer

Anca Melintescu, Dan Galeriu

5-26

Determination of In Vitro Lung Solubility and Intake-to-Dose Conversion Factor for Tritiated 13X Zeolite

Greg Staack, Yung-Sung Cheng, Yue Zhou, Tom LaBone

5-27

Consequences of Different Anthropogenic Sources on Organically Bound Tritium Concentrations in Watersystems

L. Ducros, F. Eyrolle-Boyer, S. Charmasson, D. Mourier

Technical Sessions: Monday, April 18

5-28
Tritium Levels in Milk in the Vicinity of Chronic Tritium Releases
Pierre Le Goff, Philippe Guetat, Laurent Vichot; Nadine Leconte; Pierre-Marie Badot, Frédéric Gaucheron, Michel Fromm

5-29
Exposure to Tritium: Dangerous or Not?
L. Lebaron-Jacobs, Florence Menetrier

5-30
Tritium Concentration in Carrot Plant after Short-term Exposure to Atmospheric HTO
Huifang Shen

Technical Sessions: Tuesday, April 19

6A - Tritium Interacation with Materials: Metals—I

8:00 am-10:00 am

Location: Crystal Ballroom ABC

Cochairs: Paul Korinko (SRNL), Dongxun Zhang (SINAP), G. N. Luo (Inst of Plasma Physics)

6A-1 8:00 am
Revealing the Behavior of Gas Species in Materials with In Situ TEM
Daniel C. Bufford, Clark S. Snow, David Robinson, Khalid Hattar

6A-2 8:20 am
Low Temperature Thermal Water Splitting Using Nanostructured Metal Oxides
George K. Larsen, Simona E. Hunyadi Murph

6A-3 8:40 am
A Framework for Evaluating the Effect of Radiation on the Diffusivity of Hydrogen Isotopes in a Metal Lattice
Bruce Schmitt, Ed Love, Kim Burns

6A-4 9:00 am
The Impact of Hydrophobicity of Stainless-Steel Surfaces on Tritium Inventories
C. Fagan, M. Sharpe, W. T. Shmayda, and W. U. Schröder

6A-5 9:20 am
Characterization of Tritium Permeation Profiles via Helium-3 Analyses
Walter G. Luscher, David J. Senor

6A-6 9:40 am
Overview of Fuel Retention in the JET ITER-Like Wall
A. Widdowson, E. Alves, A. Baron-Wiechec, N. Barradas, N. Catarino , J. P. Coad, K. Heinola, J. Likonen, S. Koivuranta, S. Krat, G. F. Matthews, M. Mayer, P. Petersson and M. Rubel and JET Contributors

6B - Tritium Decontamination and Waste Management

8:00 am-10:00 am

Location: Crystal Ballroom DEF

Cochairs: D. Canas (CEA), V. Fugaru (Horia Hulubei Natl Inst for Physics and Nuclear Eng) C.R. Shmayda (Univ of Rochester)

6B-1 8:00 am
Decontamination of Proton Exchange Membranes After Tritium Exposure
Craig Muirhead, Hongqiang Li, Melissa Byers, Rob Carson, Hugh Boniface, Sam Suppiah

6B-2 8:20 am
Comparison of Solutions to Reduce the Tritium Inventory in Purely Tritiated Metallic Waste
C. Decanis, M. Kresina, D. Canas, J. Pamela

6B-3 8:40 am
Developments in Robust Radioanalytical Techniques for the Determination of ^{3}H in Decommissioning Wastes and Environmental Matrices
Ian Croudace, Phil Warwick, Richard Marsh

6B-4 9:00 am
H-3 Measurement in Radioactive Wastes: Efficiency of the Pyrolysis Method to Extract Tritium from Aqueous Effluent, Oil and Concrete
R. Brennetot, M. Giuliani, S. Guegan, P. Deloffre, P. Fichet, C. Mougel

6B-5 9:20 am
Tritium Recovery from Mixed Waste
C. R. Shmayda, J. Cruz, W. T. Shmayda

6B-6 9:40 am
Leaching Tests of the Tritium Wastes Immobilized in New Cement Mixtures
V Fugaru, C Postolache, Maria Gheorghe, Lidia Radu, Nastasia Saca

Technical Sessions: Tuesday, April 19

7A - Tritium Interacation with Materials: Metals—II

10:20 am-12:20 pm

Location: Crystal Ballroom ABC

Cochairs: Yuji Hatano (Univ of Toyama), Mike Morgan (SRNL), Takuji Oda (Seoul Natl Univ)

7A-1 10:20 am
Influence of Surface Roughness and Gold Plating on the Adsorption and Absorption of Tritium into Stainless Steel (Type 316)
M. Sharpe, C. Fagan, W. T. Shmayda, and W. U. Schröder

7A-2 10:40 am
Electrochemical and Thermal Treatments for Stainless Steel Passivation
P. S. Korinko, R. B. Wyrwas, W. A. Spencer

7A-3 11:00 am
Molecular Dynamics Simulation on Hydrogen Trap Effects by Vacancy Clusters in bcc-Fe
Takuji Oda, Deqiong Zhu

7A-4 11:20 am
Effect of Tritium on Cracking Threshold in Aluminum 7075
Andrew J. Duncan, Michael J. Morgan

7A-5 11:40 am
Deuterium Diffusion and Retention Behaviors in Erbium Oxide Single Layer and Ceramic-Metal Multilayer Coatings
Takumi Chikada, Seira Horikoshi, Jumpei Mochizuki, Cui Hu, Freimut Koch, Takayuki Terai, Yasuhisa Oya

7A-6 12:00 pm
Quantitative Analysis of Deuterium Depth Profile in FeAl-Al_2O_3 Tritium Permeation Barrier Coatings and its Application in Deuterium Permeation Behaviors
Q. Zhana, H. G. Yanga, Y. Hatanob, X. M. Yuana, X. X. Zhua, X. C. Guoa

7B - Tritium Processing: Use of Zeolites

10:20 am-12:20 pm

Location: Crystal Ballroom DEF

Cochairs: Caroline Chambelland (CEA), David James (SRNL), Rodrigo Antunes (KIT)

7B-1 10:20 am
Zeolite Membranes for Tritium Processing: Preliminary Inactive Results and CAPER Upgrade for Separation Experiments with Tritium
Rodrigo Antunes, Olga Borisevich, David Demange, Nando Gramlich, Thanh-Long Le, Alejandro Ovalle

7B-2 10:40 am
Deuterium Depleted Water from TCAP R&D Using H_2/D_2 Feed
Xin Xiao, Henry T. Sessions, Ben Randall, Lucas Angelette, Michael Brown, Dave Babineau

7B-3 11:00 am
Experimental and Simulated Hydrogen Isotopes Adsorption Isotherms Over Zeolite Materials Under Cryogenic Conditions
M. Macaud, C. Gauvin, S. Lectez, J.M. Salazar, J.M. Simon, G. Weber, I. Bezverkhyy, J.P. Bellat

7B-4 11:20 am
Reduction of Glovebox Stripper System Water Loading
Dr. Jason Wilson, Dr. James Klein, Dr. Kirk Shanahan, Dr. Paul Korinko, and Anita Poore

7B-5 11:40 am
Hydrogen Isotopes Adsorption over Zeolite Materials: Modeling of Solid Gas Interactions by Molecular Dynamics Simulation
M. Macaud, S. Lectez, J.M. Salazar, J.M. Simon, G. Weber, I. Bezverkhyy, J.P. Bellat

7B-6 12:00 am
Quantitative Study of the Radiolytic Gas from Tritiated Water Adsorbed in Zeolite 4A
Manuel Grivet, Laëtitia Frances, Didier Ducret, Mikaël Douilly and C. Chambelland

Technical Sessions: Tuesday, April 19

8A - Gas Phase Detritiation

1:40 pm-3:00 pm

Location: Crystal Ballroom ABC

Cochairs: Aurelien Chassery (CEA), Steve Xiao (SRNL), Akira Taguchi (Univ of Toyama)

8A-1 1:40 pm
Catalyst Evaluation for Oxidative Stripper
Xin Xiao, Henry T. Sessions, Anita Poore

8A-2 2:00 pm
Hydrolysis of Tritiated Sodium: Advances in Understanding and Modelling of the Tritium Behaviour
Aurelien Chassery, Helene Lorcet, Joel Godlewski, Karine Liger, Pierre Trabuc, Christian Latge, Xavier Joulia

8A-3 2:20 pm
Preparation of Alveolate "Hydrophobic" Catalyst for Tritium Waste Gas Treatment
Yong Yang , Shuming Peng, Heyi Wang, Yang Du

8A-4 2:40 pm
Ce Based Oxide Loaded Honeycomb Catalyst for Detritiation
Quanwen Wu, Wenhua Luo, Daqiao Meng, Jingwen Ba

8B - Tritium Storage

1:40 pm-3:00 pm

Location: Crystal Ballroom DEF

Cochairs: Sei-Hun Yun (NFRI), Katie J. Heroux (SRNL), Kirk L. Shanahan (SRNL)

8B-1 1:40 pm
Basic Absorption/Desorption Experiment on Depleted Uranium Bed for Tritium Storage
Hyun-goo Kang, Dong-you Chung, Yun Hee Oh, Min Ho Chang, Sei-Hun Yun, Kyu-Min Song, Hongsuk Chung

8B-2 2:00 pm
Measurement of Uranium Hydride Storage Bed Engineering Parameters
P. J. Foster, R. S. Willms, W. K. Hollis, D. Dogruel

8B-3 2:20 pm
Hydriding-Induced Wall Stress Evaluation on a Four-Inch SHort (FISH) Tritium Hydride Bed
Katie J. Heroux, Edwin G. Estochen

8B-4 2:40 pm
Optimal Design and Fuel Inventory of the Multi-Bed Storage System of the SDS Considering Start-up and Shut-down Operation of the Tokamak
Jae-Uk Lee, Min Ho Chang, Sei-Hun Yun, Jin-Kuk Ha, Euy Soo Lee,In-Beum Lee, Kun-Hong Lee

9A - Tritium Facilities: Operations and Maintenance

3:20 pm-5:00 pm

Location: Crystal Ballroom ABC

Cochairs: Lee C. Cadwallader (INL), A. Morono (CIEMAT), Benjamin Hufer (SRS), D. Holunga (LLNC)

9A-1 3:20 pm
Operational Maintenance Philosophy for Tritium Processing Systems
Melissa Golyski

9A-2 3:40 pm
Management of Tritium at the National Ignition Facility
P. Epperson , K. Kasper, T. Kohut, R. Beale, S. Moyle, M. Castro, R. Thacker, D. Nelson, K. Coffee, D. Holunga, S. Brereton

9A-3 4:00 pm
Tritium Plasma Experiment Upgrade for Enhancing Tritium PMI Science
M. Shimada, C.N. Taylor, R.J. Pawelko, L.C. Cadwallader, B.J. Merrill

9A-4 4:20 pm
Recent Upgrades at the Safety and Tritium Applied Research Facility
Lee Cadwallader, Brad Merrill, Dean Stewart, L. Shayne Loftus

9A-5 3:20 pm
Direct Gas-Filling Technology Based on Thermal Gradient for Deuterium-Tritium Cryogenic Target with Micro Fill-Tube
Yu Ming-ming, Chen Shao-hua, Li Hai-rong, Wen Chen-wei, Xia Li-dong, Yin Jian, Wang Wei-wei, Huang Xin, Chen Xiao-hua, Zhou Xiao-song, Peng Shu-ming

Technical Sessions: Tuesday, April 19

9B - Tritium Processing, Purification, and Separations

3:20 pm-5:00 pm

Location: Crystal Ballroom DEF

Cochairs: Gregg A. Morgan (SRNL), Stefen Welte (KIT), Marius Valentin Zamfirache (Natl R&D Inst for Cryogenics & Isotopes Tech)

9B-1 3:20 pm
Direct Decomposition Processing of Tritiated Methane by Helium RF Plasma
Kazunari Katayama, Satoshi Fukada

9B-2 3:40 pm
Short Way Separation of D/T from He with Superpermeable Membranes in the Post-ITER Devices
Alexander Livshits, Arkady A. Yuchimchuk

9B-3 4:00 pm
Evaluation of the Effects of Impurities on SAES® ST198 Hydrogen Gettering
Gregg A. Morgan, David W. James

9B-4 4:20 pm
Experimental Performance Test of Key Components of the KATRIN Outer Tritium Loop
S. Welte, S. Fischer, M. Sturm, N. Tuchscherer, L. T. Le

9B-5 4:40 pm
A Review of Separation of Hydrogen Isotopes by Cryogenic Distillation in CAEP
Xia Xiulong

10 - Poster Session 2

5:00 pm-6:20 pm

Location: Crystal Ballroom DEF

Cochairs: Jason Wilson (SRNL), Mark Wittman (Univ of Rochester), Fanny Derasse (CEA)

Tritium Facilities and Operations

10-01
H/T Isotopic Exchange: Free Water vs Adsorbed Water on Zeolite
A. Lis, C. Chambelland, I. Moysana, L. Frances, F. Legoux, M. Douilly

10-02
Comparison of Gas Species Adsorptions on 4A and 13X Zeolites
C. Chambelland, K. Chesnel, A. Lis, I. Moysan, C. Gauvin, E. Schaer

10-03
Experimental Investigation of ZrCo Getter Beds as Candidate Process for the Tritium Extraction Systems of the European Test Blanket Modules
A. Bükki-Deme, P. Calderoni, D. Demange, E. Fanghänel, T.-L. Le, M. Sirch, I. Ricapito

10-04
Theoretical Considerations for Purification System used in Hydrogen Isotopes Separation Plants
Marius Zamfirache, Anisia Bornea, Ioan Stefanescu

10-05
Performance Characterization of a Pd-Ag Diffuser
Gregg A. Morgan

10-06
Formation of Carbonaceous Products under Radiolysis of Carbon Oxide in the DT-Fuel of Fusion Reactor
Alexey V.Golubev, Valentina N.Golubeva

10-07
Recovery of Low-Concentration Hydrogen Isotopes with Zr_2Fe Alloy
Xingbo Han, Yuan Qian , Wei Liu

10-08
Hydrogen Recovery from Methane and Water using Catalytic Reaction and Pd Membrane
Woo-Chan Jung, Pil-Kap Jung, Joung-Won Kim, Hung-Man Moon, Sei-Hun Yun, Hyeon-Gon Lee

10-9
Design of Cryogenic Distillation for Tritium Separation in China Fusion Engineering Test Reactor
Yuqi Yu, Yong Yao, Jiangfeng Song

10-10
Methods for Reducting and Quantifying Methane and Tritiated Methane Formation in High Pressure Hydrogen Isotope Diffusers
Peter R. Bossard, PhD, Andrew Kaldor, PhD

Technical Sessions: Tuesday, April 19

Tritium Interacation with Materials

10-11
Lessons from Twenty Years of Tritium Exposure to Polymers at SRS
Elise B. Fox

10-12
The Experimental Research of ^{3}He Retention Mechanisms by Aged La-Ni-Al Alloys
Binbin Liang, Weiwei Zhao, Hongguang Yang, TMT Team

10-13
Tritium Aging Effects in Some Pd-Cr, Ni, Co Alloys
Kirk L. Shanahan

10-14
Deuterium Retention in Neutron Irradiated Molybdenum
C.N. Taylor, Y. Yamauchi, M. Shimada, Y. Oya, Y. Hatano

10-15
Thermal Desorption Behavior for Helium in Aged Zirconium Tritide Films
Guijun Cheng, Xiaosong Zhou, Shuming Peng

10-16
Theoretical Calculations of the Interaction Between Hydrogen and Alloying Atom in Nickel
Wenguan Liu, Yuan Qian, Wei Liu

10 - Poster Session 2

5:00 pm-6:20 pm
Location: Crystal Ballroom DEF
Cochairs: Jason Wilson (SRNL), Mark Wittman (Univ of Rochester), Fanny Derasse (CEA)

Tritium Interacation with Materials

10-17
Lab Scaled Facilities Dedicated to the Study of Tritium Retention and Outgassing from JET Plasma Facing Components
X Lefebvre, A Hollingsworth, A Santucci, M Incelli, A Widdowson, P. Coad, R Smith, P Batistoni, N Bekris and JET contributors

10-18
Study on Radiation Effect of Poly (Vinyl Alcohol) Films Irradiated by Tritium Decay
Hairong Li, Shuming Peng, Xiaosong Zhou, Mingming Yu, Lidong Xia, Xiaohua Chen, Chenwei Wen, Shaohua Chen, Weiwei Wang

10-19
The Adsorption of Hydrogen Isotope on Graphite in Molten Salt System
Xiaoling Wu, Yuan Qian, Wei Liu

10-20
In-Situ Investigation of Deuterium Induced Corrosion of Cerium
Xiaoqiu Ye, Changan Chen

10-21
Low-Pressure and High-Temperature Tritium Behavior on Carbon
Stephen T. Lam, Ronald Ballinger, Charles Forsberg, John Stempien

10-22
Surface Treatments to Render Stainless Steel Inert for Tritium
P. S. Korinko, D. Li, W. A. Spencer

10-23
Surface Modification of ZrCo and Zr_2Fe Alloy for Enhancing the Hydriding Properties
Xiaojing Qian, Deli Luo, Chang'an Chen, Guoqiang Huang, Zhiyong Huang

10-24
Deuterium Gas Driven Permeation Behavior in W Coated V-5Cr-5Ti
Yuping Xu, Haishan Zhou, Feng Liu, Xiao-Chun Li, Ningbo Sun, Yingchun Zhang, Jing Wang, Tao Lu, Haodong Liu, Fang Ding, Guang-Nan Luo

10-25
Deuterium Retention in Deposited Tungsten Exposed in EAST
Jing Wu, Peng Wang, Li Qiao, Liang Gao, Guang-nan Luo

10-26
Tritium Aging of $LaNi_{4.15}Al_{0.85}$ (LANA.85)
David W. James, Gregory C. Staack, Simona Hunyadi-Murph

Technical Sessions: Wednesday, April 20

11A - Liquid Phase Detritiation

8:00 am-10:00 am

Location: Crystal Ballroom ABC

Cochairs: Satoshi Fukada (Kyushu Univ), Andrey V. Ovcharov (ITER), Lucas Angelette (SRNL)

11A-1 8:00 am
Preparation and Catalytic Hydrogen Isotope Exchange Activity of Porous Styrene-Divinylbenzene Polymer Supported Pt Catalyst
Akira Taguchi, Yusuke Nagaki, Takahiko Sugiyama, Masahiro Tanaka, Kenji Kotoh

11A-2 8:20 am
More Precise Values of Separation Factors in Water-Hydrogen Isotopic Exchange for Modeling of Combined Electrolysis and Catalytic Exchange Process
Andrey V. Ovcharov

11A-3 8:40 am
Aspects Concerning Manufacutre of Reproducible and Homogeneous Batches of PT/C/PTFE Catalyst for Hydrogen-Water Isotopic Exchange
Gheorghe Ionita , Gh. Titescu, I. Stefanescu, Adriana Marinoiu, Amalia Soare

11A-4 9:00 am
Tritium Water Distillation Assisted with Adsorption and Isotopic Exchange
Satoshi Fukada, Tomohiro Motomura, Satoru Hirano, Jyunji Mizutani, Yoshiaki Miho

11A-5 9:20 am
Recent Progress in the Experimental Study of LPCE Process on "EVIO" Pilot Plant
O.A. Fedorchenko, I.A. Alekseev, S.D. Bondarenko T.V. Vasyanina

11A-6 9:40 am
Rigorous Two-Fluid and Three-Fluid Liquid Phase Catalytic Exchange Models and their Application
Anthony Busigin

11B - Tritium Biological Effects

8:00 am-10:00 am

Location: Crystal Ballroom DEF

Cochairs: C. Grisolia (CEA), Greg Staack (SRNL), Carmen Varlam (ICIT)

11B-1 8:00 am
Tungsten Dust in Fusion Devices: Impact of Morphology and Characteristics of Particles on Tritium Retention/Desorption, Associated Toxicological Studies
C Grisolia

11B-2 8:20 am
Determination of *In Vitro* Lung Solubility and Intake-to-Dose Conversion Factor for Tritiated $LaNi_{4.15}Al_{0.85}$
Greg Staack, Yung-Sung Cheng, Yue Zhou, Tom LaBone

11B-3 8:40 am
HTO and OBT Exposure Induces Differential Effects on Haematopoiesis and Iron Metabolism
Jean-Marc Bertho, Dimitri Kereselidze, Line Manens, Cecile Culeux, Joel Surette, Melinda Blimkie, Lindsey Bertrand Heather Wyatt, Maâmar Souidi, Marc Benderitter, Nick Priest, Jean-René Jourdain

11B-4 9:00 am
Tritium Level Evolution in the Environment at Experimental Pilot for Tritium and Deuterium Separation -ICIT
Carmen Varlam, Ioan Stefanescu, Ionut Faurescu, Irina Vagner, Denisa Faurescu, Diana Bogdan

11B-5 9:20 am
Modeling Tritium Transfer in a Grassland Ecosystem in Response to ^3H Releases and Validating with Experimental Data
Séverine Le Dizès, Hugo Renard, Fabien Vermorel, Denis Maro, Céline Aulagnier, Marianne Rozet, Didier Hébert, Luc Solier

11B-6 9:40 am
Effects of Tritiated Thymidine on Neural Stem and Progenitor Cells
Granotier-Beckers C., Soussi I., F.D. Boussin

Technical Sessions: Wednesday, April 20

12A - Tritium Interacation with Materials: Reactor Materials

10:20 am-12:20 pm

Location: Crystal Ballroom ABC

Cochairs: Xavier Lefebvre (CCFE), Michael J. Morgan (SRNL), David J. Sensor (PNNL)

12A-1 10:20 am

Pebble Fabrication and Tritium Release Properties of a $Li_{2+x}TiO_{3+y}$ with $Li_2Z_rO_3$ Solid Solution

Tsuyoshi Hoshino, Saerom Kwon, Masayuki Ohta, Shinichi Urai, Yuki Edao, Kentaro Ochiai, Yoshinori Kawamura

12A-2 10:40 am

The Effect of Tritium Generation on Alloys Corrosion in Molten Li_2BeF_4 Salt

Guiqiu Zheng, David Carpenter, Michael Ames, Yakov Ostrovsky, Gordon Kohse, Lin-wen Hu

12A-3 11:00 am

Application of Tritium Imaging Plate Technique to Measuring Hydrogen Solubility and Diffusivity in $BaInO_{2.5}$

Kenichi Hashizume, Yusaku Oki

12A-4 11:20 pm

Development of H, D, T Simultaneous TDS Measurement System and H, D, T Retention Behavior for DT Gas Exposed Tungsten Installed in LHD Plasma Campaign

Yasuhisa Oya, Cui Hu, Hiroe Fujita, Kenta Yuyama, Shodai Sakurada, Yuki Uemura, Suguru Masuzaki, Masayuki Tokitani, Miyuki Yajima, Yuji Hatano, Takumi Chikada

12A-5 11:40 am

Simulation of the Migration of Tritium in Tungsten Materials in Fusion Devics (ITER and DEMO)

E. A. Hodille, C. Grisolia

12A-6 12:00 am

Tritium Behavior in the Water-Cooled Ceramic Breeder Blanket of CFETR

Guang-Nan Luo, Yuping Xu, Haishan Zhou, Feng Liu, Qiang Qi, Jing Wang

12B - Tritium Breeding and Extraction—I

10:20 am-12:20 pm

Location: Crystal Ballroom DEF

Cochairs: D.J. Senor (PNNL), Paul W. Humrickhouse (INL), Takahiko Sugiyama (Nagoya Univ)

12B-1 10:20 am

Modeling to Support In-Situ Data Interpretation in the TMIST-3 Irradiation Experiment

D.J. Senor, W.G. Luscher, K.K. Clayton

12B-2 10:40 am

Hydration--Carbonation of Gamma Lithium Aluminate

Brad Johnson, Larry Bagassen, Jarrod Crum, Carmen Rodriquez, Jian Liu, Herbert Schaef, Monte Elmore, Nathan Canfield, Walter Luscher, Dave Senor

12B-3 11:00 am

Preliminary System Modeling for the EUROfusion Water Cooled Lithium Lead Blanket

Fernando R. Urgorri, Carlos Moreno, Elisabetta Carella, Jesús Castellanos, Alessandro Del Nevo

12B-4 11:20 am

Overview of Tritium Target Program and Results of Lithium Aluminate

Ingrid Burgeson, Larry Bagaasen Dave Baldwin, Matt Edwards, Monte Elmore

12B-5 11:40 am

Tritium Permeation and Extraction in the Fusion Nuclear Science Facility

Paul W. Humrickhouse, Brad J. Merrill

12B-6 12:00 pm

Tritium Behavior in HCPB Breeder Blanket Unit: Modeling and Experiments

E. Carella, F. R.Urgorri, D. Demange, J. Castellanos, C. Moreno

Technical Sessions: Thursday, April 21

13A - Gas Phase Tritium Measurements

8:00 am-10:00 am

Location: Crystal Ballroom ABC

Cochairs: Sandra Romanelli (Culham Centre for Fusion Energy), Steven James Bell (National Physical Lab), DAvid Robinson (SNL)

13A-1 8:00 am
Compact Determination of Hydrogen Isotopes and Helium
David B. Robinson, Weifang Luo, Trevor Y. Cai, Kenneth D. Stewart

13A-2 8:20 am
Upgraded Analytical Gas Composition Technique in the Tritium Fuel Cycle of JET
S. G. Romanelli, A. Hollingsworth, A. Withycombe, P. Camp, R. Smith

13A-3 8:40 am
Design and Operation of a Monitoring System Which Separates and Measures High and Low Concentrations of Tritium in Air
Robert Goldstein, Dell Williamson

13A-4 9:00 am
An Integrated Bubbler-LSC for On-Line Measurements of Gaseous and Aqueous Tritium
Steven James Bell, Tom Deakin, Ben Russell

13A-5 9:20 am
Implementation of a New Tritium Monitor Calibration Facility
Steve Phillips, Anne Mely, Vincent Werth

13A-6 9:40 am
Tritium Impurities Measurement with Gas Chromatography
F. Bachelet, A. Fabre, D. Salmon, J.L. Brix

13B - Tritium Environmental Effects

8:00 am-10:00 am

Location: Crystal Ballroom DEF

Cochairs: Carl A. Mazzola (CB&I Federal Services), Volodymyr Y. Korolevych (CNL), Satoshi Konishi (Kyoto Univ)

13B-1 8:00 am
Field Testing and Intercomparison of Advanced Tritium Transfer Models
Volodymyr Korolevych, Sang Bog Kim, Nana-Owusua Kwamena, Masakazu Ota, Severine Le-Dizes-Maurel, Denis Maro, Celine Ailagnier, Luc Patryl

13B-2 8:20 am
Oceanic Behavior of Tritium Upon Deep-Sea Release
Shutaro Takeda, Ryuta Kasada, Fumito Okino, Shigeki Sakurai, Satoshi Konishi

13B-3 8:40 am
A Comparison of Tritium Dispersion Methodology for Accident Analysis in U.S. Department of Energy Complex Facilities
Kevin R. O'Kula, David C. Thoman

13B-4 9:00 am
Investigation of the Potential Impact of Storage Place on Tissue Free Water Tritium and Organically Bound Tritium Activity Determination. Feedback of an Interlaboratory Exercise
Nicolas Baglan, Eric Ansoborlo

13B-5 9:20 am
Relevance of Night Production of OBT in Crops
Dan Galeriu, Anca Melintescu

13B-6 9:40 am
Specific Activities of OBT in Soil around Nuclear Power Plant
Lin Du, Qin Zhang, Yu-hua Ma, Ling Wang, Lai-lai Qin, Ke Deng, Zheng-hai Xia, Wei Liu

14A - Liquid Phase Tritium Measurements

10:20 am-12:20 pm

Location: Crystal Ballroom ABC

Cochairs: Laura L. Tovo (SRNL), Sebastian Mirz (KIT), Luis Angel Sedano (Fus_Allanz S/E&C)

14A-1 10:20 am
Radioactive Characterization of Tritiated Heavy Water using ESR Spectrometry
C Postolache, D Negut, V Fugaru

14A-2 10:40 am
Design of a Spectroscopy Experiment for All Hydrogen Isotopologues in the Liquid Phase
Sebastian Mirz, Uwe Besserer, Beate Bornschein, Robin Größle, Bennet Krasch, Stefan Welte

14A-3 11:00 am
Isolating Low Concentration of Tritium in Potable Water using Simple Designed and Fabricated Process
Peter Ozemoyah, John Robinson

Technical Sessions: Thursday, April 21

14A - Liquid Phase Tritium Measurements

10:20 am-12:20 pm

Location: Crystal Ballroom ABC

Cochairs: Laura L. Tovo (SRNL), Sebastian Mirz (KIT), Luis Angel Sedano (Fus_Allanz S/E&C)

14A-4 11:20 am
Development of Fast-Response Solved-Tritium Concentration Diagnostics
L. Sedano, F. Medina, J. Abellà, J. Llorca

14A-5 11:40 am
Tritium Measurement with Organic Waste-Less Method
Etsuko Furuta, Akira Taguchi, Takuya Saze

14B - Tritium Breeding and Extraction—II

10:20 am-12:20 pm

Location: Crystal Ballroom ABC

Cochairs: Cochairs: Blair P. Bromley (CNL), Christian Day (KIT), Elisabetta Carella (CIEMAT)

14B-1 10:20 am
Overview of the European R&D on Tritium Technology for DEMO Breeding Blanket
D. Demange, R. Antunes, F. Arbeiter, L. Frances, C. Moreno, A. Morono, D. Rapisarda, A. Santucci, R. Smith, M. Utili

14B-2 10:40 am
Preparation of a Core-shell Adsorbent for Lithium Isotope Separation
Takahiko Sugiyama

14B-3 11:00 am
Lithium Enrichment Needs for Tritium Breeding
Thomas Giegerich, Christian Day

14B-4 11:20 am
Tritium Recovery Efficiency under Array of PbLi Droplets in Vacuum
Fumito Okino, Laetitia Frances, David Demange, Ryuta Kasada, Satoshi Konishi

14B-5 11:40 am
Development and Modelling of a Multi-Nozzle Vacuum Sieve Tray Extraction Facility
L. Frances, D. Demange, S. Konishi, M. Mertens, A. Munoz, F. Okino

14B-6 12:00 pm
First-Principle Study on Structures and Energetics of Intrinsic Vacancy Defects in Li_4SiO_4
Man Jiang, Mingjie Zheng, Jingping Xin, Wenyi Ding, Qunying Huang, FDS Team

15A - Future Tritium Facility Planning

1:40 pm-3:00 pm

Location: Crystal Ballroom ABC

Cochairs: Rachel Elizabeth Lawless (CCFE), Armando Antoniazzi (Kinectrics, Inc.), Ki Jung Jung (NFRI)

15A-1 1:40 pm
Tritium Plant Technology Development for a DEMO Power Plant
Rachel Lawless Barry Butler, Rebecca Shaw, Patrick Camp, Sebastian Russell-Smith, Sophie Bashforth, Christopher Timberlake, Alessia Santucci

15A-2 2:00 pm
Technology Decision Making for a Tritium Removal Facility
Stephen Strikwerda, Armando Antoniazzi

15A-3 2:20 pm
A Large Scale Demonstration Facility for Light Water Detritiation
N. Bonnet, G. Bonhomme, Y. Iwasaki, D. Carlson, J. Raymont

15A-4 2:40 pm
ITER-like Tokamak Exhaust Gases in JET Active Gas Handling System: Process Optioneering
P Camp, R.C. R. Shaw, R. Olney, R. Smith, R. Walker

15B - Tritium Pumping

1:40 pm-3:00 pm

Location: Crystal Ballroom DEF

Cochairs: Gregg A. Morgan (SRNL), Thomas Giegerich (KIT), Hongsuk Chung (KAERI)

15B-1 1:40 pm
Thermo-Mechanical Design Study of a Linear Mercury Diffusion Pump for Tritium Processing
Thomas Giegerich, Christian Day, Xueli Luo, Ralf Müller, Santiago Ochoa, Holger Strobel

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15B-2 2:00 pm
Performance Testing of a Potential Replacement for the Normatex® Pump
Gregg A. Morgan

15B-3 2:20 pm
Positive Displacement Scroll Pump Technology for Tritium Processing Systems
Bryce Shaffer, Louis Boone

15B-4 2:40 pm
Tritium Aspects of Fueling and Exhaust Pumping in Magnetic Fusion Energy
Bryce Shaffer, Louis Boone

16A - Other Tritium Topics

3:20 pm-5:00 pm

Location: Crystal Ballroom ABC

Cochairs: Lutz Bornschein (KIT), Todd Whitehome (CNL), Kanetsugu Isobe (JAERI)

16A-1 3:20 pm
Tritium Control and Capture in Salt-Cooled Fission and Fusion Reactors
Charles W. Forsberg, David M. Carpenter, Dennis G. Whyte, Raluca Scarlat, Liu Wei

16A-2 3:40 pm
Metal Tritides as Power Sources for Tritium Betavoltaics
Brian L. Ellis, N. Philippi, A. Haavisto, S. Thomson, S. Suppiah

16A-3 4:00 pm
Status of the Karlsruhe Tritium Neutrino Mass Experiment KATRIN
Lutz Bornschein, Beate Bornschein, Sylvia Ebenhöch, Moritz Hackenjos, Florian Priester, Marco Röllig and Michael Sturm for the KATRIN collaboration

16A-4 4:20 pm
Tritium Production and Partitioning from the Irradiation of Lithium-Beryllium Fluoride Salt
David Carpenter, Michael Ames, Guiqiu Zheng, Gordon Kohse, and Lin-wen Hu

16A-5 4:40 pm
R&D Progress of Tritium Technology on the Broader Approach
Kanetsugu Isobe, Makoto Oyaidzu, Takumi Suzuki, Hirofumi Nakamura, Yasunori Iwai, Masayuki Yamada, Rie Kurata, Dai Inomiya, Yukihiro Murodate, Takumi Hayashi, Toshihiko Yamanishi

16B - Tritium Confinement and Safety

3:20 pm-5:00 pm

Location: Crystal Ballroom DEF

Cochairs: Ene Daniela (ESS), Kimberly A. Burns (PNNL), Kenneth Kasper (LLNL)

16B-1 3:20 pm
Tritium at the National Ignition Facility—Where Did It Go?
Kenneth Kasper, Rick Thacker

16B-2 3:40 pm
Key Management Tritium Issues at ESS facility
Daniela Ene

16B-3 4:00 pm
Progress of ISO Standards on the Confinement Systems in Fusion Facilities using Tritium
L. Lepetit, P. Cortes, L.Thomas

16B-4 4:20 pm
The Research Progress of Tritium in HTR-10
Yi Xu, Feng Xie, Hong Li, Jianzhu Cao, Jiejuan Tong, Xuegang Liu, Xiaogui Feng

16B-5 4:40 pm
Tritium Production in Secondary Sources
Kim Burns, Ed Love

17 - Poster Session 3

5:00 pm-6:20 pm

Location: Crystal Ballroom DEF

Cochairs: Elise Fox (SRNL), Sam Suppiah (AECL), Joseph Wheeler (SRNL)

Tritium Measurement, Monitoring, and Accountancy

17-01
Tritium Measurement of Waste in Large Volume Drums
A. Godot, K. Galliez, G. Jossens, C. Mathonat, D. Demange

17-02
Large Volume Calorimeter LVC 1380 for the Tritium Measurement in Radioactive Waste Packages
K. Galliez, G. Jossens, F. Bachelet, A. Godot, C. Mathonat

Technical Sessions: Thursday, April 21

17 - Poster Session 3

5:00 pm-6:20 pm

Location: Crystal Ballroom DEF

Cochairs: Elise Fox (SRNL), Sam Suppiah (AECL), Joseph Wheeler (SRNL)

Tritium Measurement, Monitoring, and Accountancy

17-03

A Seebeck-type Approach to Hydride Bed Inventory Tracking, PseudoSeebeck Calorimetry

Kirk L. Shanahan

17-04

Speciation of Tritium with Organic Molecules in Nuclear Plant Discharges

C. Merignac, C. Landesman, I. Deniau, A. Bacchetta, H. Schneider, G. Heisbourg, M.B. Mokili, G. Montavon

17-05

Development Trials of an Acid Dissolution Line for Tritium Assay

Damaris Roffey

17-06

Overview of Tritium Monitoring Technology for Fusion Reactor Fueling Systems

Jacky M. Shoulders, Ronald E. Battle

17-07

Obtaining of Thin Layer Radioactive Surface Sources Through Radio-Induced Grafting of Labeled Monomers

C. Postolache, V. Fugaru

17-08

Tritium Counting by Europium Coordination Complex

Masanori Hara, Haruna Sakaguch, Masato Nakayama, Shinsuke Abe, Masao Matsuyama, Takayuki Abe, Tsukasa Aso

17-09

TEACUP: A Tritium Management and Supplemental Core Follow Program

Jennifer Lyons, James Livingston, Edward Love, Kimberly Burns

17-10

A New Device for Tritium Activity Measurement of Tritiated Water

Florian Priester

17-11

First Calibration of an IR Absorption Spectroscopy System for the Measurement of H2, D2 and HD Concentration in the Liquid Phase

Robin Größle, Alexander Kraus, Sebastian Mirz, Sebastian Wozniewski

17-12

Tritium Imaging Techniques for the Study of Tritium Transport in the Graphite Fuel Elements of Fluoride-Salt Cooled High-Temperature Reactors (FHRs)

Huali Wu, Quentin Deslot, Raluca O Scarlat

17-13

Performance of Inorganic Oxides for the Non-Reversible Trapping of Hydrogen: Application to Tritium Analysis

Kévin Galliez, Alain Godot, David Lambertin

17-14

Design Considerations for a Tritium Process Analytical Measurement System

Laura L Tovo, Nancy V. Halverson, Anita S. Poore

Tritium Breeding and Extraction

17-15

Study on Hydrogen Isotopes Behavior in LiPb Forced Convection Flow

Mao Kinjo, Satoshi Fukada, Ryosuke Yoshimura, Taiki Muneoka, Kazunari Katayama

17-16

The Effect of MHD Mixed Convection on Tritium Transport in Fusion-Relevant Configurations

Hongjie Zhang, Alice Ying, Mohamed Abdou

17-17

Tritium Contamination Prevention Using Sacrificial Materials

Paul Korinko, Simona Hunyadi Murph, George Larsen

Tritium Breeding and Extraction

17-18
Study on the Gas Extraction in Molten Salt Reactor for Tritium Control
Hua Li, Ling Wang, Yuan Qian, Wei Liu

17-19
Chemical Kinetics Study of Reactions Between HTO and H2 in Purge Gas Flow in Tritium Breeding Blanket
Michiko Ahn Furudate, Seungyon Cho

17-20
Removal of Low-Concentration Deuterium from Fluidized Li Loop for IFMIF
Yushin Yamasaki, Satoshi Fukada, Kazuma Hiyane, Kazunari Katayama

17-21
The System Design of Tritium Extraction From Ceramic Breeder Material With H_2O Added In Helium Purge Gas
Y. Yao, D. L. Luo, R. J. Xiong, Y. Q. Yu, J. F. Song

17-22
Tritium Extraction from Lithium-Lead EU DEMO Blanket using Permeator Against Vacuum
V. D'Auria, S. Dulla, P. Ravetto, L. Savoldi, M. Utili, R. Zanino

17-23
Investigation of Correlation Between Irradiation Defects and Deuterium Release
Qiang Qi, Jing Wang, Guangnan Luo

17-24
Tritium Production Assessment for the DCLL EUROfusion DEMO
Iole Palermo, D. Rapisarda, I. Fernández, C. Moreno, F.R. Urgorri, A. Ibarra

Technical Sessions: Friday, April 22

18 - Near-Term, New Tritium Capabilities

8:00 am-9:40 am

Location: Crystal Ballroom ABC

Cochairs: : David W. Babineau (SRNL), Satoshi Konishi (Kyoto Univ), Hugh Boniface (CNL)

18A-1 8:00 am
Isotope Separation System at the University of Rochester's Laboratory for Laser Energetics
M. D. Wittman, W. T. Shmayda, J. L. Reid, and R. F. Earley

18A-2 8:20 am
Heat Transfer Experimental Verification of a High Power Tritium-Titanium Rotating Target Prototype
Qianfeng Yu, Gang Wang, Xiang Ji, Wen Wang, FDS Team

18A-3 8:40 am
Preliminary Designing and R&D Progresses of Fuel Cycling System for CFETR
Heyi Wang, Shuming Peng, Xiaolin Wang

18A-4 9:00 am
Tritium Facilities in JAEA and Future Plan
Kanetsugu Isobe, Takumi Hayashi

18A-5 9:20 am
Renewing the Tritium Facilities at Chalk River
Hugh Boniface, Kevin McCrimmon, Don Ryland, Sam Suppiah

19 - Panel Discussion: Progress in Tritium Regulations and Standards

10:00 am-11:00 am

Location: Crystal Ballroom ABC

Cochairs: William W. Weaver (DOE), Donald Ryland (AECL), Antonio Provenzano (AWE Plc)

19-1 10:00 am
Progress in Tritium Regulations and Standards
Panelist: William W. Weaver (DOE),
Antonio (Tony) Provenzano (AWE Plc), Loic Lepetit (ITER)

20 Closing Ceremony
11:00 am-12:00 pm
Robert P. Addis (SRNL), Steve Xiao (SRNL), James E. Klein (SRNL)

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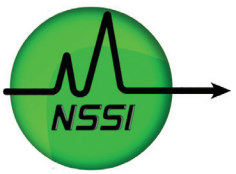

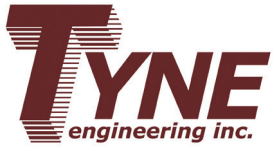

Notes

ANS Conference

Tritium 2016

April 17-22, 2016
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