GIF Education and Training Working Group’s Activities

Chair: Patricia Paviet
Co-Chair: Konstantin Mikityuk

Members (14) in alphabetical order:
Bucalossi, Andrea
De La Chevrotiere, Antoine
Fratoni, Massimiliano
Harrison, Grace
Hwang, Il Soon
Kim, Hyeon-Jin [James]
Kulikov, Evgeny
Jun, Sun
Latge, Christian
Liu, Xiaojing
Mihara, Takatsugu
Mikityuk, Konstantin
Mpoza, Nolitha
Paviet, Patricia

Chair: Patricia Paviet
Co-Chair: Konstantin Mikityuk

14th GIF-IAEA Interface Tele-Meeting – 8 July 2020
GIF Education and Training Working Group

Launched as a task force in November 2015, it became a working group in November 2019. It provides a platform to enhance open education and training (E&T) on Gen IV advanced reactor systems and facilitates communication and networking of individuals and organizations that support GIF activities.

- organizes monthly webinar on Gen IV systems and cross-cutting subjects.
- proposes, organizes and supports Generation IV E&T workshops, seminars and schools
- maintains a social media platform through which information and ideas are exchanged on general Generation IV R&D topics as well as Generation IV E&T activities.
- has made available an outreach flyer ETWG initiatives.

14th GIF-IAEA Interface Tele-Meeting – 8 July 2020
Motivation

The ETWG is serving as an ambassador to inform about the Gen IV reactor systems to sustain and build a competent nuclear workforce but also to inform about Gen IV reactor systems. Developing a talented pipeline with the skilled workforce of today is an imperative requirement to address nuclear energy demands of tomorrow.

Given that the current nuclear energy workforce is approaching the age for retirement, and that a limited number of universities in the world provides advanced reactor systems curriculum, we are faced with a growing demand for the training and education in the Gen IV system arena.

14th GIF-IAEA Interface Tele-Meeting – 8 July 2020
Series of Gen-IV Webinars

A series of Generation-IV webinars has been launched in September 2016 and is currently offered once a month.

- 90 minutes online lecture on one GIF system or cross-cutting topic from top-level experts followed by Q&A at the end of the presentation;
- 42 webinars have been presented as of today

https://register.gotowebinar.com/register/7016925286117373965

14th GIF-IAEA Interface Tele-Meeting – 8 July 2020
# 42 Webinars

## 3 Webinars - INTRODUCTION

<table>
<thead>
<tr>
<th>Webinar</th>
<th>Speaker</th>
<th>Country</th>
</tr>
</thead>
<tbody>
<tr>
<td>Atoms for Peace - John Kelly, USA</td>
<td></td>
<td>USA</td>
</tr>
<tr>
<td>Introduction to Nuclear Reactor Design - Claude Renault, France</td>
<td></td>
<td>France</td>
</tr>
<tr>
<td>European Sodium Fast Reactor, An Introduction - Konstantin Mikityuk, Switzerland</td>
<td></td>
<td>Switzerland</td>
</tr>
</tbody>
</table>

## 9 Webinars - OPERATIONAL EXPERIENCE

<table>
<thead>
<tr>
<th>Webinar</th>
<th>Speaker</th>
<th>Country</th>
</tr>
</thead>
<tbody>
<tr>
<td>Design, Safety Features and Progress of HTR-PM - Yujie Dong, China</td>
<td></td>
<td>China</td>
</tr>
<tr>
<td>Feedback Phenix and Superphenix - Joel Guizde, France</td>
<td></td>
<td>France</td>
</tr>
<tr>
<td>Molten Salt Actinide Recycler &amp; Transforming System with and without Th-U Support: MOSART - Victor Ignatiev, Russia</td>
<td></td>
<td>Russia</td>
</tr>
<tr>
<td>Astrid Lessons Learned - Gilles Rodriguez, France</td>
<td></td>
<td>France</td>
</tr>
<tr>
<td>Safety Of Gen IV Reactors - Luca Ammirabile, EC</td>
<td></td>
<td>Italy</td>
</tr>
<tr>
<td>Advanced Lead Fast Reactor European Demonstrator, ALFRED Project - Alessandro Alemberi, EC</td>
<td></td>
<td>Europe</td>
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<tr>
<td>Russia BN 600 &amp; BN 800 - Ilya Pakhomov, Russia</td>
<td></td>
<td>Russia</td>
</tr>
<tr>
<td>The ALLEGRO Experimental Gas Cooled Fast Reactor Project - Ladislav Belovsky, Czech Republic</td>
<td></td>
<td>Czech Republic</td>
</tr>
<tr>
<td>SFR Safety Design Criteria (SDC) and Safety Design Guideline (SDG), Shigenobu Kubo, Japan</td>
<td></td>
<td>Japan</td>
</tr>
</tbody>
</table>

## 14 Webinars - GEN IV SYSTEMS

<table>
<thead>
<tr>
<th>Webinar</th>
<th>Speaker</th>
<th>Country</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sodium cooled Fast Reactor - Bob Hill, USA</td>
<td></td>
<td>USA</td>
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<tr>
<td>Lead Fast Reactor - Craig Smith, USA</td>
<td></td>
<td>USA</td>
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<tr>
<td>Gas cooled Fast Reactor, Alfredo Vassile, France</td>
<td></td>
<td>France</td>
</tr>
<tr>
<td>MYRRHA An Accelerator driven System Based on LFR Technology - Hamid Ait Abderrahim, Belgium</td>
<td></td>
<td>Morocco</td>
</tr>
<tr>
<td>Lead Containing mainly isotope Pb-208: New Reflector for Improving Safety of Fast Neutron Reactors - Evgeny Kulikov, Russia</td>
<td></td>
<td>Russia</td>
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<tr>
<td>Very High Temperature Reactors - Carl Sink, USA</td>
<td></td>
<td>USA</td>
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<tr>
<td>Fluoride cooled-High Temperature Reactors - Per Peterson, USA</td>
<td></td>
<td>USA</td>
</tr>
<tr>
<td>Molten Salt Reactors - Elsa Merle, USA</td>
<td></td>
<td>USA</td>
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<tr>
<td>Gen IV Coolants Quality Control - Christian Latge, France</td>
<td></td>
<td>France</td>
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<tr>
<td>Czech Experimental Program on MSR Technology Development, Jan Uhlíř, Czech Republic</td>
<td></td>
<td>Czech Republic</td>
</tr>
<tr>
<td>Thermal Hydraulics in Liquid Metal Fast Reactor, Antoine Gerschenfeld, France</td>
<td></td>
<td>France</td>
</tr>
<tr>
<td>Micro-reactors: A Technology Option for Accelerated Innovation, D.V. Rao, USA</td>
<td></td>
<td>USA</td>
</tr>
<tr>
<td>GIF VHTR Hydrogen Production Project Management Board, Sam Suppiah, Canada</td>
<td></td>
<td>Canada</td>
</tr>
</tbody>
</table>

## 6 Webinars - GEN IV CROSS CUTTING TOPICS

<table>
<thead>
<tr>
<th>Webinar</th>
<th>Speaker</th>
<th>Country</th>
</tr>
</thead>
<tbody>
<tr>
<td>Energy Conversion, Richard Stainsby, United Kingdom</td>
<td></td>
<td>United Kingdom</td>
</tr>
<tr>
<td>Estimating Costs of Gen IV Systems - Geoffrey Rothwell, NEA/OECD</td>
<td></td>
<td>USA</td>
</tr>
<tr>
<td>Materials Challenges for Gen IV Reactors - Stu Maloy, LANL, USA</td>
<td></td>
<td>USA</td>
</tr>
<tr>
<td>Performance Assessment for Fuels and Materials for Advanced Nuclear Reactors, Daniel LaBrier, USA</td>
<td></td>
<td>USA</td>
</tr>
<tr>
<td>Proliferation Resistance and Physical Protection of Gen IV Reactor Systems, Robert Bari, BNL, USA</td>
<td></td>
<td>USA</td>
</tr>
<tr>
<td>Passive Decay heat Removal System, Mitchell Farmer, ANL, USA</td>
<td></td>
<td>USA</td>
</tr>
</tbody>
</table>

## 3 Webinars - FUEL TYPES

<table>
<thead>
<tr>
<th>Webinar</th>
<th>Speaker</th>
<th>Country</th>
</tr>
</thead>
<tbody>
<tr>
<td>General Consideration on Thorium as a Nuclear Fuel - Franco Michel-Sendis, NEA/OECD</td>
<td></td>
<td>Switzerland</td>
</tr>
<tr>
<td>Metallic Fuels for SFRs - Steven Hayes, USA</td>
<td></td>
<td>USA</td>
</tr>
<tr>
<td>Advanced Gas Reactor TRISO Particle Fuel - Madeline Feltus, USA</td>
<td></td>
<td>USA</td>
</tr>
</tbody>
</table>

## 4 Webinars - SUSTAINABILITY AND FUEL CYCLE

<table>
<thead>
<tr>
<th>Webinar</th>
<th>Speaker</th>
<th>Country</th>
</tr>
</thead>
<tbody>
<tr>
<td>Closing the Fuel Cycle, Myeung Seung, Republic of Korea</td>
<td></td>
<td>Republic of Korea</td>
</tr>
<tr>
<td>Sustainability, A Relevant Approach for Defining Future Nuclear Fuel Cycles - Christophe Poinssot, France</td>
<td></td>
<td>France</td>
</tr>
<tr>
<td>Scientific and Technical Problems of Closed Nuclear Fuel in Two-Components Nuclear Energetics - Alexander Orlov, Russia</td>
<td></td>
<td>Russia</td>
</tr>
<tr>
<td>Comparison of 16 Reactors Neutronic Performance in Closed Th-U and U-Pu Cycles. Jiri Krepel, Switzerland</td>
<td></td>
<td>Switzerland</td>
</tr>
</tbody>
</table>

## Winners of the Elevator Pitch Challenge (EPiC) contest at the GIF Symposium, Paris, October 2018

<table>
<thead>
<tr>
<th>Webinar</th>
<th>Speaker</th>
<th>Country</th>
</tr>
</thead>
<tbody>
<tr>
<td>Formulation of Alternative Cement Matrix For Solidification/Stabilization of Nuclear Waste - Matthieu de Campos, France</td>
<td></td>
<td>France</td>
</tr>
<tr>
<td>Interactions between Sodium and Fission Products in case of a severe Accident in a Sodium-cooled Fast Reactor - Guilhem Kauric, France</td>
<td></td>
<td>France</td>
</tr>
<tr>
<td>Security Study of Sodium Gas Heat Exchangers in Frame of Sodium-Cooled Fast Reactors - Fang Chen, France</td>
<td></td>
<td>China</td>
</tr>
</tbody>
</table>

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**14th GIF-IAEA Interface Tele-Meeting – 8 July 2020**
## Webinars planned until April 2021

<table>
<thead>
<tr>
<th>Presenter</th>
<th>Title of Webinar</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dr. Frederik Reitsma, IAEA</td>
<td>Overview of Small Modular Reactor Technology Development</td>
<td>29 July 2020</td>
</tr>
<tr>
<td>Dr. David Holcomb, ORNL, USA</td>
<td>MSR Safety Evaluation in the US</td>
<td>26 August 2020</td>
</tr>
<tr>
<td>Dr. Shannon Bragg-Sitton, INL, USA</td>
<td>Integrated Energy Systems Laboratory Initiative</td>
<td>22 September</td>
</tr>
<tr>
<td>Dr. Amy Schweikert, Colorado School of Mines, USA</td>
<td>Global Potential for Small and Micro Reactor systems to Provide Electricity Access</td>
<td>28 October 2020</td>
</tr>
<tr>
<td>Prof. Jonathan Link, Virginia Tech, USA</td>
<td>Neutrino and Gen IV reactor systems</td>
<td>19 November 2020</td>
</tr>
<tr>
<td>Dr. Cody Wiggins, University of Tennessee, USA</td>
<td>Development of Multiple-Particle Positron Emission Particle Tracking for Flow Measurement</td>
<td>17 December 2020</td>
</tr>
<tr>
<td>Dr. Nathalie Chauvin, CEA France</td>
<td>MOX Fuel for Advanced Reactors</td>
<td>28 January 2021</td>
</tr>
<tr>
<td>Dr. David Peeler, PNNL, USA</td>
<td>Overview of Waste Treatment Plant, Hanford Site</td>
<td>25 February 2021</td>
</tr>
<tr>
<td>Mr. Etsuo ISHITSUKA, JAEA Japan</td>
<td>Experience of HTTR Licensing for Japan's New Nuclear Regulation</td>
<td>22 April 2021</td>
</tr>
</tbody>
</table>

14th GIF-IAEA Interface Tele-Meeting – 8 July 2020
We have recently converted all the archived webinar as YouTube videos that can be viewed at
https://www.youtube.com/channel/UCEHOQ63gD01fSKbCIY9XvSQ

14th GIF-IAEA Interface Tele-Meeting – 8 July 2020
Attendance of Live and Archived Webinars as of 26 June 2020

Total of live webinar viewing: 3082

Total viewing: 7316

Total of archived viewing: 4234

14th GIF-IAEA Interface Tele-Meeting – 8 July 2020
GIF Webinar Attendance as of 26 June 2020

Total of attendees # 3082

14th GIF-IAEA Interface Tele-Meeting – 8 July 2020
Microreactors A Technology Option for Accelerated Innovation

– 226 participants for the live webinar

26 March 2020

International Organizations 57%
- Canadian Nuclear Laboratories
- CEA
- China Academy of Space Technology
- China Nuclear Power Engineering Co., LTD
- China National Nuclear Corporation
- DEN/UFPE
- European Commission - Joint Research Centre
- Federal University of Rio de Janeiro
- Framatome
- INEST/CAS
- INET, Tsinghua University
- International Atomic Energy Agency
- Istanbul Technical University
- Japanese Atomic Energy Agency
- Japan Nuclear Safety Institute (JANSI)
- Korea Atomic Energy Research Institute (KAERI)
- Kansai University
- Kaunas University of Technology
- Mitsubishi Heavy Industries, Ltd.
- National Centre for Nuclear Research
- National Institute of Technology, Tokuyama College
- Natural Resources Canada
- Nigeria Atomic Energy Commission
- Nuclear AMRC
- NUCLIC - Nuclear Innovation Consultancy
- Ontario Power Generation
- Paul Scherrer Institute
- Politecnico di Milano
- Seoul National University of Science and Technology
- Shanghai Jiao Tong University
- Shanghai Nuclear Engineering Research & Design Institute Co. Ltd
- Studsvik Japan, Ltd.

State Agencies (2%) NY, PA, TX
- National Laboratories (21%)
  - Argonne National Laboratory
  - Brookhaven National Laboratory
  - Idaho National Laboratory
  - Los Alamos National Laboratory
  - Naval Nuclear Laboratory
  - Nevada National Security Site
  - Oak Ridge National Laboratory

Contractors and Commercial Organizations (11%)
- Fluor Marine Propulsion
- MPR Associates, Inc.
- Westinghouse Electric Company
- Fauske & Associates, LLC
- Elysium Industries USA
- Premier Technology, Inc.
- ITTA, Inc.
- Framatome Inc.
- IBEX
- Southwest Research Institute

Federal Agencies (4%)
- US Department of Energy
- National Institute of Standards and Technology

Universities (4%)
- Idaho State University
- University of New Mexico
- University of Illinois
- Virginia Tech
- Missouri Science and Technology
- North Carolina State University

The Birmingham University
- The Institute of Applied Energy
- The University of Tokyo
- Toshiba Energy Systems & Solutions Corporation
- University of Oxford
- University of Sharjah
- University Politehnica Bucharest
- Xi’an Jiaotong University

14th GIF-IAEA Interface Tele-Meeting – 8 July 2020
Comparison of 16 Reactors Neutronic Performance in Closed Th-U and U-Pu Cycles
147 Participants – 24 June 2020

Federal Agencies (3%)
- U.S. Department of Energy
- U.S. Environmental Protection Agency
- U.S. Nuclear Regulatory Commission

International Organizations (77%)
- Delft University of Technology (TU Delft)
- Framatome
- Ontario Tech University
- Office for Nuclear Regulation (ONR)
- Canadian Nuclear Laboratories
- Commissariat à l’énergie atomique (CEA)
- Moltex Energy
- École Polytechnique Fédérale de Lausanne (EPFL)
- Institut National de Physique Nucléaire et de Physique des Particules
- Departamento de Energia Nuclear (DEN-UFPE)
- Tokyo Institute of Technology
- Nuclear Research and Consultancy Group (NRG)
- VUJE, a.s.
- Tokyo City University
- Terrestrial Energy Inc.
- Universidad Politécnica de Madrid
- Waseda University
- Université Paris Sud
- Japan Atomic Energy Agency
- Research Center Rez
- Technische Universität Dresden
- Nuclear Power Corporation of India (NPCIL)
- Czech Technical University
- Ulsan National Institute of Science and Technology (UNIST)
- Matrix
- International Atomic Energy Agency
- Paul Scherrer Institut (PSI)
- National Centre for Nuclear Research
- Southwest Research Institute
- Yalova University

National Laboratories (5%)
- Idaho National Laboratory
- Brookhaven National Laboratory
- Oak Ridge National Laboratory
- Argonne National Laboratory
- Los Alamos National Laboratory

State Agencies (2%)
- AS, NY, NM
- Marubeni Corporation
- Chalmers University of Technology
- Tractebel
- Center for Energy Research
- Westinghouse (Brazil)
- NGO
- BRNO University of Technology
- VTT
- Radioactive Waste Management Funding and Research Center
- Institute for Nuclear Research
- RCNP Osaka University
- Central Research Institute of Electric Power Industry
- Nuclear-21
- State Nuclear Power Safety Inspectorate (VATESI)
- Universidad Autónoma Metropolitana - Unidad Iztapalapa
- Mirion Technologies Inc.
- Natural Resources Canada
- Politecnico di Milano
- National University of Mongolia
- North-West University
- The Institute of Applied Energy
- Tokuyama College
- Japan Information and Culture Center (JICC)

Universities (5%)
- Texas A&M University
- University of Notre Dame
- North Carolina State University
- Iowa State University
- University of Illinois

Contractors and Commercial Organizations (8%)
- NuSynergy Energy, LLC
- Union of Concerned Scientists
- Elysium Industries USA
- NuCon.US
- Framatome Inc.
- Orano
- Southern Company
Webinar Announcement

26 August 2020, 8:30 am (EDT) – www.gen-4.org

- Same format
- Title of presentation
- Lecture overview
- Who should attend
- Registration link
- Bio of the presenter
- Announcement of future presentations

Free attendance registration at: www.gen-4.org

14th GIF-IAEA Interface Tele-Meeting – 8 July 2020
Webinar series supported by GIF website

www.gen-4.org

14th GIF-IAEA Interface Tele-Meeting – 8 July 2020
LinkedIn group of GIF-Education and Training created in 2015 (244 members as of 26 June 2020), Platform for Gen-IV information and discussions. [https://www.linkedin.com/groups/8416234](https://www.linkedin.com/groups/8416234)
Attendance Worldwide of GIF Webinars

14th GIF-IAEA Interface Tele-Meeting – 8 July 2020
Building Interaction with Regional Education Networks

Possibility of cooperation with regional education networks was analyzed. Five regional nuclear educational networks identified:

<table>
<thead>
<tr>
<th>Network Name</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENEN</td>
<td>(European Nuclear Education Network, Europe) has mission of the preservation and further development of expertise in the nuclear field by higher education and training.</td>
</tr>
<tr>
<td>ANENT</td>
<td>(Asian Network for Education in Nuclear Technology, Asia) focused on cooperation, and sharing of information and knowledge for nuclear capacity building through E&amp;T by utilization of e-Learning platform in Asia and the Pacific region.</td>
</tr>
<tr>
<td>LANENT</td>
<td>(Latin American Network for Education in Nuclear Technology, Latin America) aims to facilitate and improve cooperation in education, training and outreach in nuclear technology in the Latin American and Caribbean region.</td>
</tr>
<tr>
<td>AFRA-NEST</td>
<td>(African Network for Education in Science and Technology) aims to facilitate operation and networking in higher education, training and related research in nuclear science and technology in the African Region.</td>
</tr>
<tr>
<td>STAR-NET</td>
<td>(Eurasia) aims to facilitate cooperation in education and professional training in the nuclear sector and related research and outreach in nuclear technology. Present members are 30 universities. It has a unique legal entity registered in Austria as a non-profit organization and sponsored by membership fee and contribution.</td>
</tr>
</tbody>
</table>

14th GIF-IAEA Interface Tele-Meeting – 8 July 2020
Panel Session: Building Next Generation Nuclear; Enabling Succession Planning to Create and Maintain a Well Educated Workforce in the NE Sector

Chair: John Kelly
Panelists:
NNL and Nuclear Skills Strategy Group (UK) – Dr. Fiona Rayment
PNNL (USA) – Dr. Patricia Paviet
KAERI (Korea) – Prof. Il Soon Hwang
CNDL (Canada) – Kathy McCarthy
IAEA – Stephano Monti
ENEN – Leon Czijel
UW – Madison – Prof. Adrien Couet - Nuclear Innovation Boot Camp

Prof. Max Fratoni, Lecturer

14th GIF-IAEA Interface Tele-Meeting – 8 July 2020
Advertising Event and Engaging Younger Workforce
ANS -Young Member Group Competition

• Are you a student in the process of finishing your PhD in the field of nuclear engineering or have you just recently defended your thesis?

• The Young Member Group is organizing a “Pitch your PhD” competition at the ANS Winter meeting on November 18 afternoon. You will have **3 minutes** to present your thesis and to captivate an audience of peers who will vote for the best pitches. The **winners will receive $300 (first place), $200 (second place) awards** given out during the conference. The winner will also be invited to publish a pitch in **ANS News** and to **present a Webinar hosted by the Generation IV International Forum (GIF)**.

• To register to participate in this competition, you just need to contact Nicolas Stauff ([nstauff@anl.gov](mailto:nstauff@anl.gov)) before **October 30** with your name, university, PhD subject, and defense date. Registering to this event does not preclude participation as a speaker/poster at the Winter Meeting. We are looking forward to seeing you in Washington DC!

14th GIF-IAEA Interface Tele-Meeting – 8 July 2020
We are planning to....

- Continue to propose webinars dedicated to Gen IV systems and other relevant subjects
- Continue to engage collaboration with other organizations
- Continue to publish, participate in events such as ANS meeting, Global/Top Fuel 2019, and others...
- Be engaged at Summer Schools

Reinforce Activities on Public Outreach

- Knowledge preservation
- Knowledge management

14th GIF-IAEA Interface Tele-Meeting – 8 July 2020
Conclusions

GIF ETWG was established in 2015 and supports E&T in multiple ways:

– Webinars
– Summer School Participation
– Conference/Workshop/Local Meeting Participation
– Papers/Newsletter/Invited Panelist
– 42 Webinars presented as of 08 July 2020


"GIF Webinars: An Online Educational Resource", oral presentation at the GIF 2018 Symposium, 16-17 October 2018, Paris, France


"Gen IV Education and Training Working Group Webinars’ Initiative", paper accepted for oral presentation, ANS winter Meeting 15-18 November 2020, Chicago, USA

14th GIF-IAEA Interface Tele-Meeting – 8 July 2020
“Because of the passion and grass root efforts from Professionals and Educators, the GIF-ETWG’s goal of creating an archive of online Gen IV systems webinar series becomes a reality”

Thank you for your attention