



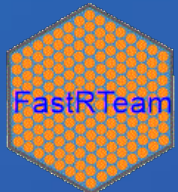
**IAEA**

International Atomic Energy Agency

*"Atoms for Peace and Development"*

# IAEA Interregional Workshop on Advances in Design of Generation-IV SMRs Beijing, 3-7 June 2024

## Workshop on Gen-IV SMRs: Agenda and Introduction of Speakers



*Vladimir Kriventsev*

Fast Reactor Technology Development Team  
Nuclear Power technology Development Section  
Division of Nuclear Power  
Department of Nuclear Energy  
International Atomic Energy Agency

<https://www.iaea.org/topics/fast-reactors>

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# Workshop Agenda and Speakers



Time	Monday, 3 June	Tuesday, 4 June	Wednesday, 5 June	Thursday, 6 June	Friday, 7 June
09:30-10:30	1. Opening 2. Progress in Technology of Innovative Reactors <i>Vladimir Kriventsev, IAEA</i>	The Westinghouse LFR and SMR Reactor Design <i>Jun Liao, WEC</i>	Fuel and Fuel Cycle aspects for Gen-IV reactors <i>Alexander Bychkov (online)</i>	Site visit / facility tour (if applicable and relevant)	Production of H <sub>2</sub> and Non-Electrical applications of Gen-IV SMRs ( <i>online</i> ) <i>Rami El-Emam Ontario Tech.</i>
10:30-11:00	<b>Break</b>				
11:00-12:30	1. Recent Development of LFR Technology <i>Jun Liao, WEC</i> 2. MSRs: Entire Category of Reactors <i>Jiri Krepel, PSI</i>	MSRs: Potential for Modularity and Sizing <i>Jiri Krepel, PSI</i>	<b>Panel Discussion on Benefits and Challenges of Innovative Gen-IV SMRs</b> Moderator: <i>Vladimir Kriventsev, IAEA</i>	Site visit / facility tour (if applicable and relevant)	1. <b>Innovative Micro Reactors in China (TBC)</b> <i>TBD, China</i> 2. General Discussions on Innovative Gen-IV SMRs.
12:30-14:00	<b>Lunch</b>				
14:00-15:30	1. IAEA Activities on Innovative Nuclear Energy Systems <i>Vladimir Kriventsev, IAEA</i> 2. Review of Goals and Activities of the IAEA TC Department <i>Elena Krikorian, Nikita Butakov, IAEA</i>	<b>National presentations<sup>1</sup></b> 1. HTR development in China <i>Fu Li, Tsinghua University</i> 2. Development of SFR SMR Technology <i>Yang Yong, CNNC</i>	1. Overview of IAEA Activities on Safety of Gen-IV Systems 2. Considerations on Safety of LMFR with Focus on Severe Accidents <i>Vincenzo Tiberi, IAEA (online)</i>	Site visit / facility tour (if applicable and relevant)	Summary and Conclusions <i>Adjourn</i>
15:30-16:00	<b>Break</b>				
16:00-17:00	<i>Poster Session I</i>	<i>Poster Session II</i>	<i>Poster Session III</i>	Site visit	

<sup>1</sup> These sessions might include specific session dedicated to the broad representation of the host country experience with SMRs

- Fellow Engineer in Advanced Reactor Development, Westinghouse Electric Company (USA) since 2005.
  - Development of advanced reactors: Lead cooled Fast Reactor, eVinci microreactor, AP300 SMR, AP1000, Westinghouse SMR.
- Expertise:
  - Safety analysis of PWR and LMR, thermal hydraulics of PWRs and LMR, licensing of advanced reactors, passive safety system, model and simulation, machine learning in nuclear engineering.
- Education:
  - PhD in Aerospace Engineering, University of Florida, 2005
  - M.S. Dept. of Energy and Power Engineering, Xian Jiaotong University, 1997
  - B.E. Huazhong University of Science and Technology, 1994
- Activities:
  - Fellow of American Nuclear Society
    - Thermal Hydraulic Division: Executive Committee and Program Committee, Chair of Industry Engagement Committee.
  - Member of American Society of Mechanical Engineers, multiphase system committee.
  - Adjunct Faculty, University of Pittsburgh, Department of MEMS.
  - Associate Editor, ASME Journal of Nuclear Engineering and Radiation Science.





- Dr Jiri Krepel is a senior scientist in Advanced Nuclear Systems group of Laboratory for Scientific Computing at **Paul Scherrer Institut (PSI)** in Switzerland.
- He earned his PhD in 2006 at the Czech Technical University in Prague / Helmholtz-Zentrum Dresden-Rossendorf in Germany for his thesis entitled "Dynamics of Molten Salt Reactors."
- Dr Krepel is the coordinator of the PSI MSR research at Paul Scherrer Institut and responsible for fuel cycle analysis and related safety parameters of Gen IV reactors.
- He is also the chairman of the Steering Committee of GIF MSR project and co-developer of the IAEA MSR taxonomy.
- Dr Krepel has experience in the neutronics of liquid-metal and gas-cooled fast reactors and in neutronics and transient analysis of thermal and fast MSRs.



- Nuclear Safety Officer, IAEA Safety Assessment Section
  - Lead work on design safety and safety assessment of non-water-cooled reactors, including SMRs
- Professional experience:
  - French Institute for Radiological Protection and Nuclear Safety (IRSN)
    - 2019-2023 | Deputy head – Hazards and Safety Approaches Section
    - 2012-2019 | Project management engineer - New Reactors Department
    - 2009-2012 | Nuclear Scientist - Gas-cooled, Fast neutron and Experimental Reactors Department
- Expertise:
  - Safety assessment of Gen-II-III-IV reactors: safety approaches (deterministic and probabilistic demonstrations, defence in depth, “practical elimination”, etc.), internal and external hazards, reactor physics
- Education:
  - M.S. Energy Economics, Paris Dauphine University, 2024
  - M.S. Energy and Nuclear Engineering, University of Rome “La Sapienza”, 2009
  - B.S. Energy Engineering, University of Rome “La Sapienza”, 2003

# Our Lecturers:

# Dr Alexander BYCHKOV

Independent Nuclear Expert. Retired from the IAEA (up to date)

2020 - 2023 – Senior Nuclear Engineering Expert, INPRO/IAEA

2015-2020 - ROSATOM's representative (diplomatic) to the International Organizations in Vienna (2015-2020) and Adviser of Rosatom's CEO (2015)

2011-2015 - IAEA Deputy Director General, Head of the Department of Nuclear Energy

2006 - 2011 - Director General of the Research Institute of Atomic Reactors (RIAR) in Dimitrovgrad, Russian Federation,

1982 – 2011 – different positions in RIAR.

Graduated in chemistry from Moscow State University in 1982, PhD from 1998

Main areas of R&D activity: the nuclear fuel cycle subjects, including fast reactors nuclear fuel technology and performance, pyro-processing for manufacturing and recycling of nuclear fuel, high level wastes, molten salt chemistry of actinides, radionuclide technologies, research reactors applications, design, safety and other aspects of nuclear R&D facilities.

Expert on international cooperation, political and strategic aspects of nuclear energy as well as nuclear infrastructure.

Co-author of more than 170 scientific publications, and invited professor and lecturer



## Prof. Rami ELEMAM



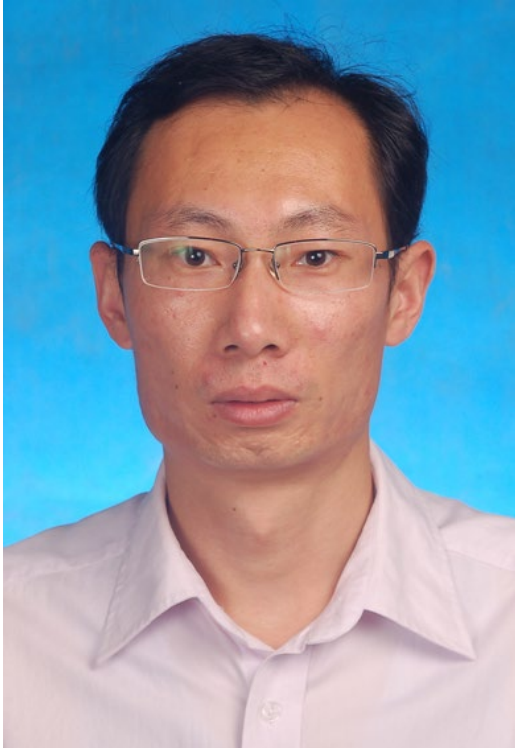
**Dr. ELEMAM is currently serving at several roles at:**

### **Ontario Tech University**

- **Strategic Advisor** to senior leadership on Clean Industries & Technologies
- **Director** of Core Facilities & Strategic Initiatives
- **Adjunct Professor** at the Faculty of Business and IT (AI&CyberSec 4 Nuclear)
- **Coordinator** of the University workplan as an IAEA Collaborating Centre

### **International Nuclear and Hydrogen Expert:**

- **Board Member** on the Canadian Hydrogen Association
- Canada's rep to the IAEA INPRO Steering Committee
- IAEA Working Group on Nuclear Desalination & Water Management
- IEA Task 44 on Nuclear Hydrogen
- The Nuclear Hydrogen Initiative of the US CATF



- Science and technology leader on fast reactor core field in CNNC.
- Engaged in the start-up experimental work of China Experimental Fast Reactor and its experiments application.
- The study of long-life multi-purpose sodium cold small reactor .
- The designing on multipurpose sodium coolant fast test reactor in HuLudao, a new site of CIAE research facilities.
- Study of closed fuel cycle mode with fast reactor.
- Participated in the INPRO project of the IAEA.



- Professor, Deputy Chief Engineer, Institute of Nuclear and New Energy Technology (INET), Tsinghua University, China.
  - Education, research, engineering design on HTR
- Expertise:
  - Neutronics design, Safety analysis, General design of HTR
- Education:
  - Ph.D. in Nuclear Engineering and Safety from Tsinghua University in 1995
  - B.E. in Nuclear Engineering and Safety from Tsinghua University in 1990
- Activities:
  - Chinese representative to VHTR System Steering Committee of Gen IV International Forum
  - Member of Chinese Nuclear Society, HTR, Digitalization and System Engineering



# Our Lecturers

**Mr Nikita Butakov**

**Ms Elena Krikorian**

Department of Technical Cooperation, IAEA



# Scientific Secretary: Dr Vladimir Kriventsev

- Since 2016, Team Leader of Fast Reactor Technology Development Team, IAEA
  - Vladimir serves a Scientific Secretary for the IAEA activities on fast reactors, such Coordinated Research Projects (CRPs), Education and Training Workshops, International Conferences, etc.
- PhD from Obninsk Inst. for Nuclear Engineering in 1994
- Dr. Eng. from Tokyo Institute of Technology in 1999
- Vladimir has been working in the area of nuclear engineering and fast reactor technology in
  - IPPE (Obninsk)
  - TITech (Tokyo Inst. of Technology)
  - JNC (JAEA now)
  - INPE (Obninsk) and
  - KIT (Germany, former FZK)





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**Good Luck!**

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# **IAEA Interregional Workshop on Advances in Design of Generation-IV SMRs *Beijing, 3-7 June 2024***

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