Technical Meeting on Artificial Intelligence for Nuclear Technology and Applications

Monday, 25 October 2021 - Friday, 29 October 2021

Virtual Event

Topics

The **plenary cross-cut sessions** will focus on the following topics:
Enabling Infrastructure
Advanced Modelling and Simulation Methodologies

The **working group sessions** – whose participants and talks will be established by the Organizers of the Sessions – will focus on the following thematic areas:
Ethics
Food and Agriculture
Human Health
Nuclear Data
Nuclear Fusion
Nuclear Physics
Nuclear Power
Nuclear Security
Radiation Protection
Radioisotopes and Radiation Technology
Safeguards Verification
Water and Environment

(Plenary) Enabling Infrastructure

Keywords: artificial intelligence; machine learning; open data science; standardized frameworks; comprehensive data management; uncertainty quantification; data curation; high performance computing; advanced manufacturing; educational and training activities; ethics.

(Plenary) Advanced Modelling and Simulation Methodologies

Keywords: integrated modelling; multi-physics multiscale modelling; virtual systems/digital twin technology; optimized system design; improved system performance and user experience.

(Working Group) Ethics

Keywords: trustworthiness; human rights; sustainability objectives; AI ethics (water ethics, climate ethics, ethics and health, AI and nuclear safety, AI-energy ethics).

(Working Group) Food and Agriculture

Keywords: food authentication; food safety early warning systems; soil type prediction; insect screening; plant viability screening.

(Working Group) Human Health

Keywords: diagnosis and treatment of cancer; image interpretation; treatment plans and contouring; adaptive radiotherapy; medical processes.

(Working Group) Nuclear Data

Keywords: nuclear, atomic and molecular data; data analysis; verification; uncertainty quantification; anomaly detection; information discovery.

(Working Group) Nuclear Fusion

Keywords: plasma prediction; control system; model generation.

(Working Group) Nuclear Physics

Keywords: data analysis; data management; experimental design and optimization; facility operation.

(Working Group) Nuclear Power

Keywords: outage; maintenance; planning; scheduling; inspection; training; engineering assessment; risk assessment; machine learning.

(Working Group) Nuclear Security

Keywords: anomaly detection; data analysis (flow, sensor, image); data integration; data management; defensive computer security (network) architecture; internet of things – cloud services; information protection; performance assessment; systems design analysis; threat analysis; training; vulnerability management.

(Working Group) Radiation Protection

Keywords: computer simulations including work simulations; processes including radiation exposure with algorithms; health and safety in workplaces; radiological data across machines; radiation protection programmes; online dosimetry; optimization; planning and training; validation by measurements; instrumentation; robotics.

(Working Group) Radioisotopes and Radiation Technology

Keywords: radiopharmaceutical design and modelling; radiation dose distribution - animal models and irradiated samples; sediment transport calculations; heat transfer and cooling of targets.

(Working Group) Safeguards Verification

Keywords: nuclear measurements; surveillance; non-destructive assay; tampering detection; gamma spectroscopy; spent fuel verification; Cerenkov light; dynamic calorimetry; fissile mass quantification.

(Working Group) Water and Environment

Keywords: water security and protection; complex data analysis – spatial and temporal; groundwater modelling; study of the hydrological cycle; climate models.