



First announcement



European workshop on Magneto-hydrodynamics in liquid metal systems (MHD)

Organized by University of Latvia, Institute of Physics
Place: Krakow (Poland), Riga & Salaspils (Latvia), July 8th -12th, 2022

⇒ **Organized in two parts and two places:**



Krakow (Poland)

&



Riga (Latvia)

- **Part 1:** lectures on MHD applications in nuclear field, *embedded in Summer School (July 8th to 9th)* organized by University of Science and Technology in **Kraków (Poland)** and **EuMHD** (European Society of Magnetohydrodynamics: <https://eumhd.com/>), within the frame of **PAMIR Conference (July 4th to 7th)** (<https://eumhd.com/pamir2022/>)
- **Part 2:** lectures in **Riga (Latvia) (July 11th & 12th)** on ESFR-SMART project, R&D on MHD applications, thermo-pumps, start-up **and** operation of dedicated Na loop (SSL-EMT) and its instrumentation, including practical calibration exercises. Visit of IPUL.
- **Nota:**
 - 1 Students will have the possibility to follow the Summer School courses in video mode if necessary and to go only to Riga (Latvia). However, the organizers strongly suggest that students participate in all three events (Conference PAMIR, Summer School and ESFR-SMART Workshop). Registration for the PAMIR Conference (organized from July 4 to 6 in Krakow) must be made directly on the Conference website (<https://eumhd.com/pamir2022/>).
 - 2 Transportation from Krakow to Riga has to be organized by attendees. Some suggestions will be done on the Seminar Website
 - 3 In case of impossibility to attend the experimental activity in Riga, due to pandemia, the event will be organized remotely, at the same date (same program).

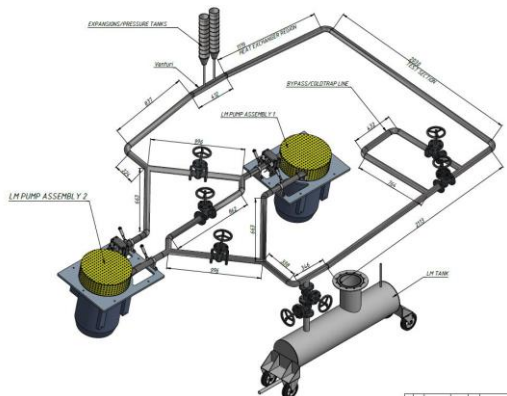
OBJECTIVES OF THE WORKSHOP

The Workshop is organized in the framework of the ESFR-SMART Project, and it is devoted to topics related with magneto-hydrodynamics, thermal-hydraulics and technologies ie EM pumps, thermo-pumps, instrumentation... and issues concerning the safety of sodium fast reactors.

GENERAL CONTEXT

One important aspect of safe operation of 4th Generation reactors relies on the coolant behavior. The understanding of the thermal-hydraulic and magneto-hydrodynamics (MHD) phenomena of liquid metals is crucial for the design of pumps, instrumentation... and safety assessment of the new reactors. Recently, a renewed interest in the whole world for Advanced Modular Reactors of small power makes it possible to propose new options such as heat pumps, more innovative energy conversion systems, up-graded instrumentation...

The workshop aims to introduce the audience into the field of MHD and its potential applications in liquid metals, emphasizing the relationship with new systems and technologies and reactor safety. First, fundamentals of MHD will be addressed, focusing on liquid metals and particularly on sodium. Then, the modeling strategies and computer codes for the simulation of these relevant physical phenomena will be tackled. The dedicated facilities and experiments to investigate the involved phenomena and mechanisms will be also introduced, as well as other MHD applications, during the visit of IPUL. The students will have the possibility to participate, by following an interactive pedagogy, to some practical exercises dedicated to the operation of a new Sodium facility dedicated to MHD (SSL-EMT) and calibration of 3 flowmeters, using Venturi tube, under the supervision of IPUL qualified staff.



TO WHOM IT IS ADDRESSED

Master and PhD students, regulatory authorities, scientific and technical staff and young professionals are welcome. The session of practical exercise is dedicated to Master and PhD students. The workshop language will be English.

TOPICS

- 1) General aspects of Liquid Metal Fast Reactors
- 2) Large Electro-magnetic Pumps
- 3) Thermo-pumps and their potential Implementation in nuclear systems

- 4) Instrumentation for flow-rate measurements
- 5) MHD Cold crucible for Severe Accident studies
- 6) Innovative Energy conversion systems

AGENDA

Program of the workshop (coming soon) has been established to begin Thursday 8th 9 am and finish Tuesday 12th 17pm

SCIENTIFIC COMMITTEE

| | | |
|--------------------|------|--|
| Leonids Buligins | IPUL | leonids.buligins@lu.lv |
| Linards Goldsteins | IPUL | linards.goldsteins@lu.lv |
| Kalvis Kravalis | IPUL | kalvis.kravalis@lu.lv |
| Imants Kaldre | IPUL | imants.kaldre@gmail.com |
| Christian Latgé | CEA | christian.latge@cea.fr |
| Antoine Alemany* | CNRS | antoine.alemany@grenoble-inp.fr |

- For coordination of Part 1: Summer School in Krakow

WORKSHOP ORGANIZING COMMITTEE

| | | |
|------------------|------|--|
| Leonids Buligins | IPUL | leonids.buligins@lu.lv |
| Imants Kaldre | IPUL | imants.kaldre@gmail.com |
| Christian Latgé | CEA | christian.latge@cea.fr |

VENUE

The workshop will be held in:

- Krakow, (University of Science and Technology) (aleja Adama Mickiewicza 30), and
- Riga at the University of Latvia Academic Center' s House of Science in Tornakalna, Jelgavas street 1, Riga, LV-1004.

Detailed information with respect to hotel accommodation and transport will be provided later. (University of Latvia).

FEES

The workshop (organized from July 8th to 12th in Krakow and Riga) is free of charge for participants from European organizations involved in ESFR-SMART project.

Nota: Registration for the PAMIR Conference (organized from July 4th to 7th in Krakow) must be made directly on the Conference Website (with fees) (<https://eumhd.com/pamir2022/>).

CONTACT INFORMATION & REGISTRATION

Useful information can be found at [Workshop website](#) (open by mid of February)

To apply for registration, fill the [registration form](#) before **April 14th, 2022**. (to be discussed with LGI)

Questions related to the Workshop should be addressed to the Workshop Organizing Committee.

ACCOMMODATION

Some suggestions will be included in the [Workshop website](#) (to be created)