Team for the Future of NICA student's internship in the JINR in Dubna (Russia)

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What is JINR

- JINR – Joint Institute for Nuclear Research
- International, intergovernmental organization
- 18 member states
- 6 associate members

Member states and associate members

JINR laboratories

- **Veksler and Baldin Laboratory of High Energy Physics,**
- Dzhelepov Laboratory of Nuclear Problems,
- Bogolyubov Laboratory of Theoretical Physics,
- Frank Laboratory of Neutron Physics,
- Flerov Laboratory of Nuclear Reactions,
- Laboratory of Information Technologies,
- Laboratory of Radiation Biology.

International cooperation

Collaboration with more than 1000 scientific centers and universities in 74 countries:

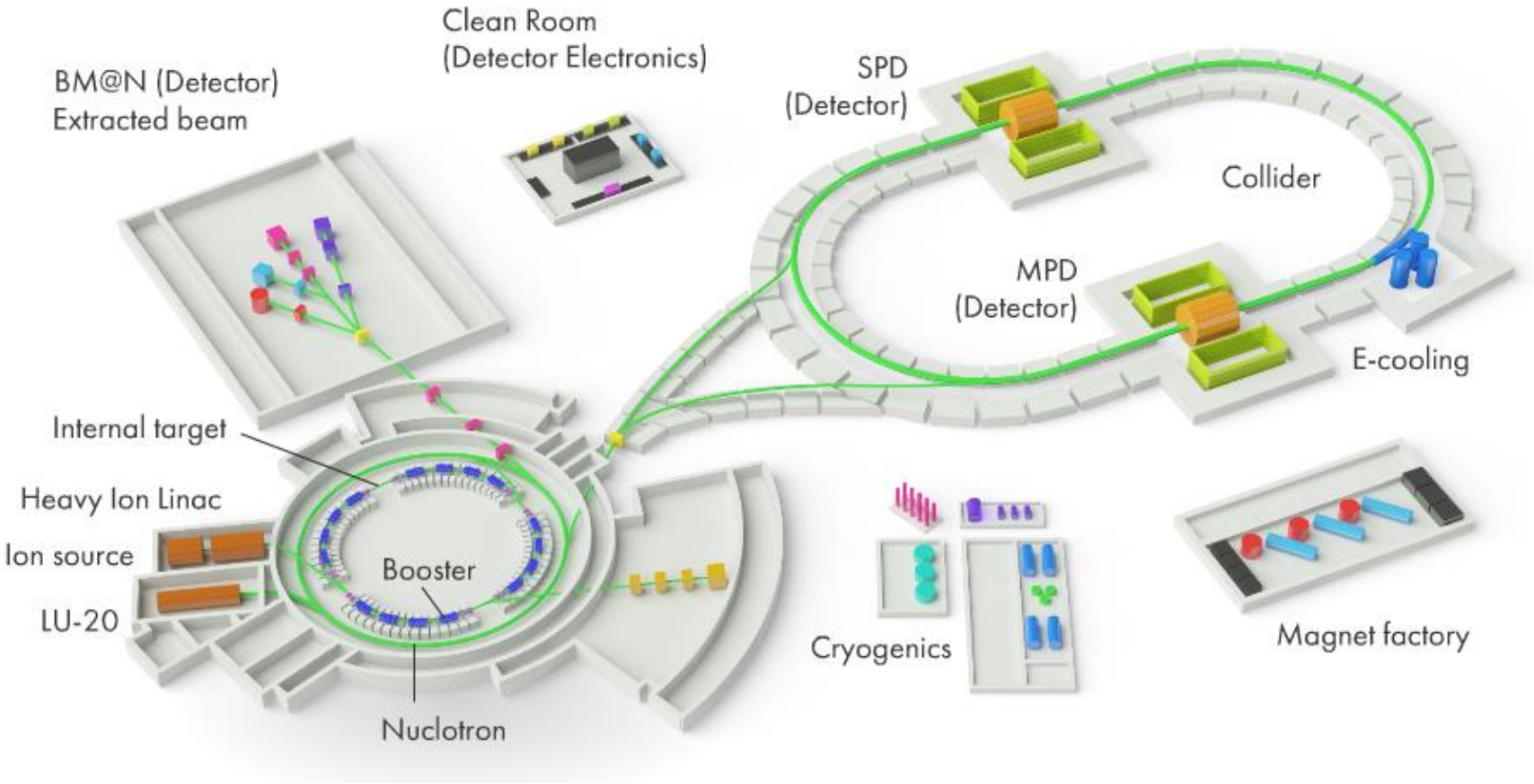
- CERN
- NASA
- DESY
- BNL
- UNESCO
- ROSKOSMOS

What is NICA?

NICA (Nuclotron-based Ion Collider fAcility) consists of:

- NICA innovation block
- Computer unit, computer networks and computing cluster
- Accelerator block (ion sources, booster synchrotron, ion synchrotron nuclotron, collider)
- Experimental setups:
  - Detector for study of Baryonic Matter at Nuclotron (BM@N)
  - MPD (Multi Purpose Detector)
  - Spin Physics Detector (SPD) for study of nucleon spin structure

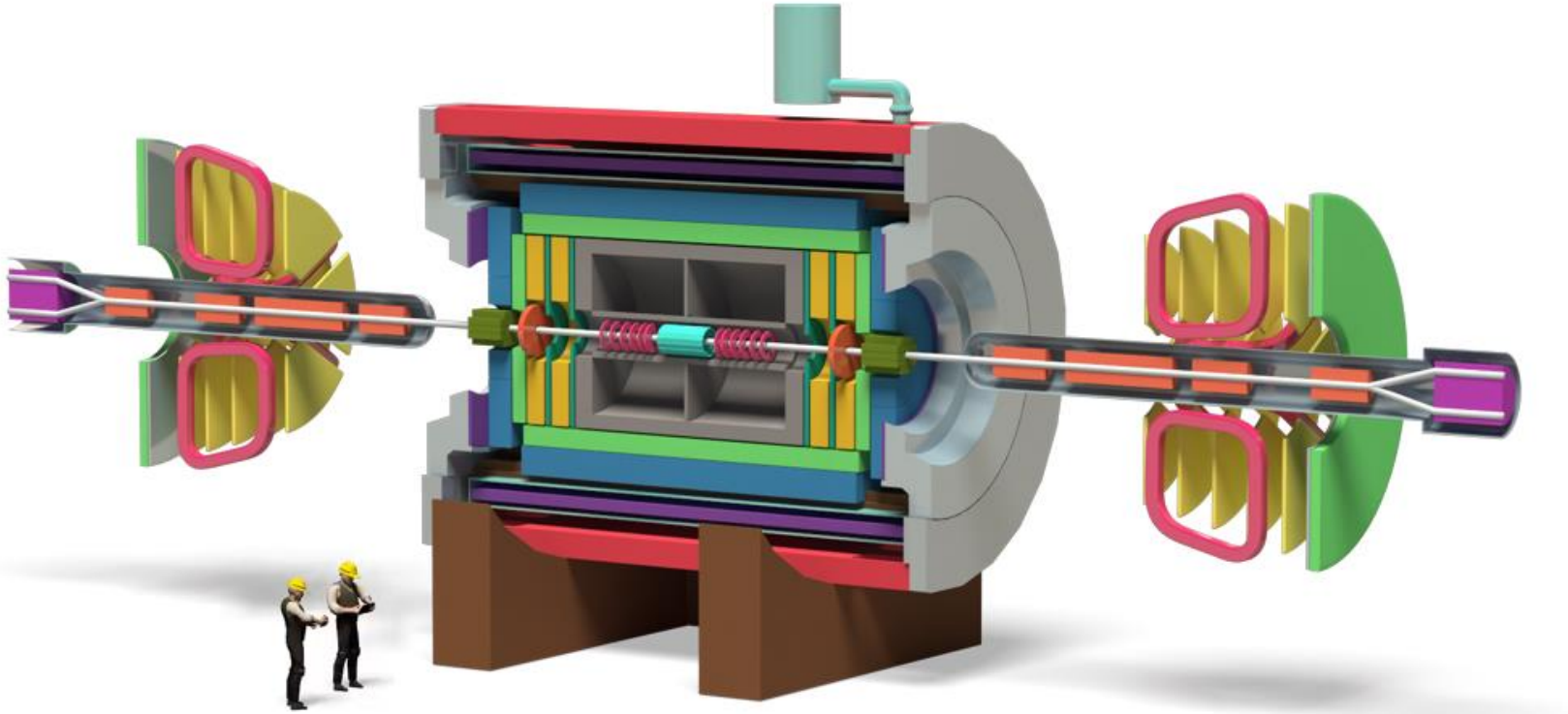
NICA


Clean Room
(Detector Electronics)
BM@N (Detector)
Extracted beam
SPD
(Detector)
Collider
MPD
(Detector)
E-cooling
Internal target
Heavy Ion Linac
Ion source
LU-20
Booster
Nuclotron
Cryogenics
Magnet factory

What is MPD

- Designed for experiments on colliding beams of the NICA
- For the detailed study of the QCD phase diagram at high densities and temperatures
- To search for new states of hadron matter and phase transitions

MPD

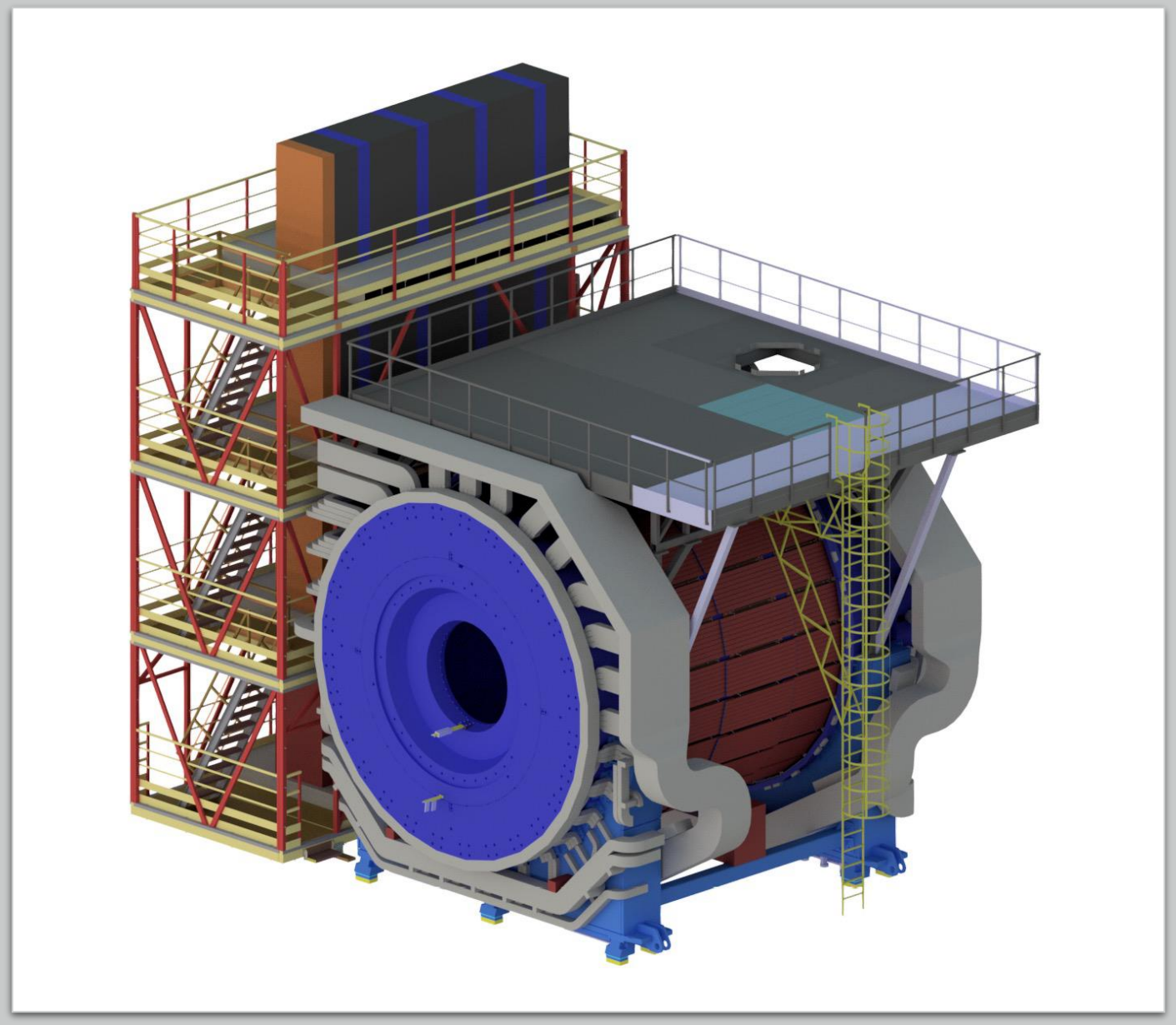


Areas of engineering work

- NICA-MPD-Platform
- Cryogenics of the MPD
- Gas supply system for TOF (Time Of Flight) detector
- Cooling of the ITS (Inner Tracker System) and TOF detectors
- Equipment Database
- And many more…

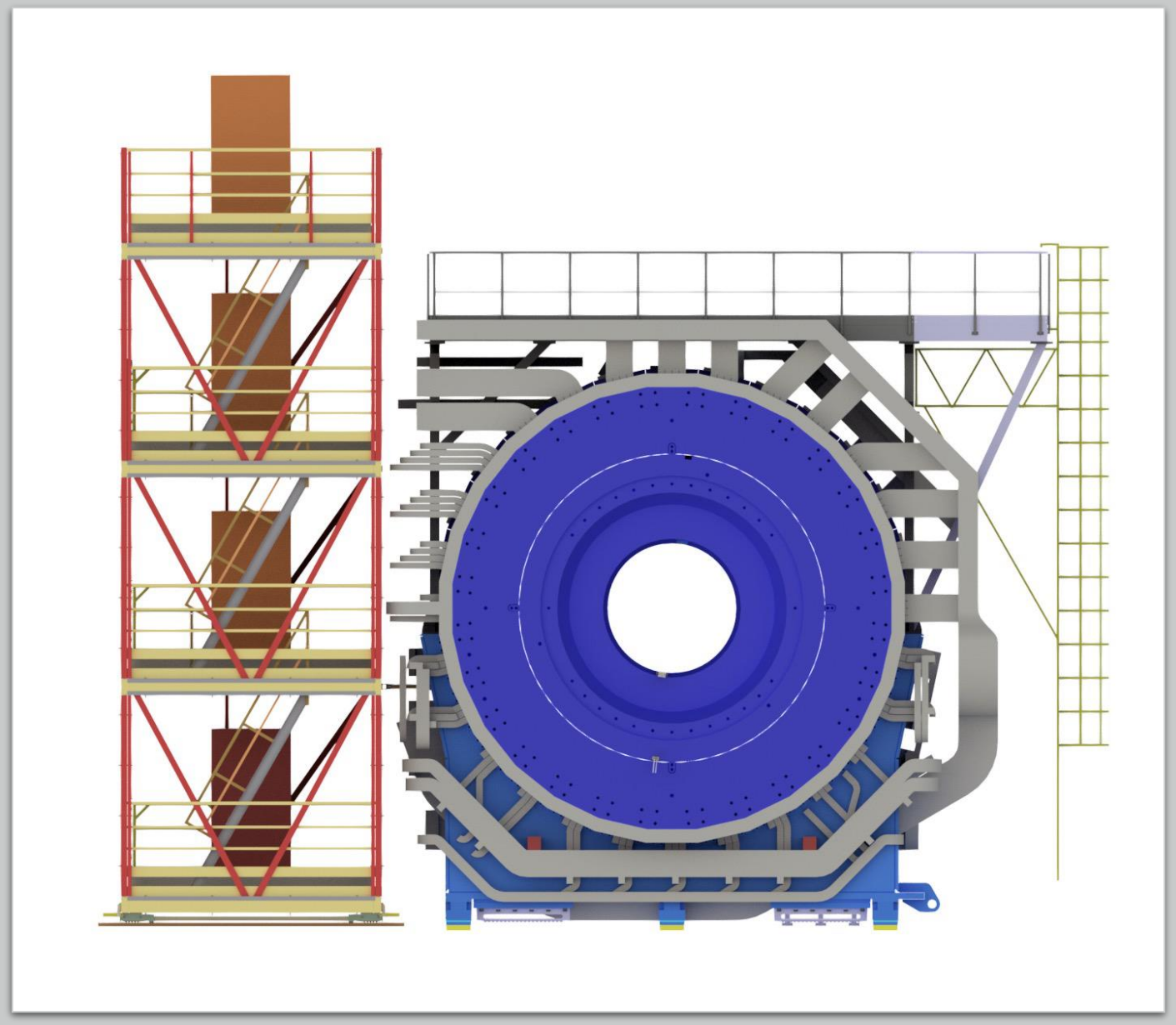
NICA-MPD-Platform

- Four floor structure
- Equipped with IT RACKs of various functions
- Provides working conditions for power supply systems, DAQ electronics, monitoring and control elements of the subdetectors.



Features of the NICA-MPD-Platform

- Ducting system
- IT RACKS on the NMP
- Raised floor
- Power Supply
- Cooling System
- Structural Cabling
- Access control and management system
- Video based fire detection
- CCTV video surveillance system
- Emergency sound notification system
- Radiation monitoring system
- Magnetic field measurement system
- Autonomous fire extinguishing system
- Intelligent Power Distributor



General information about the program

- Based on the amendment to the agreement of the cooperation between JINR and WUT
- Is concerning only NICA project, strictly connected with MPD
- Length of the program is from three months (holidays) up to one year
- Warsaw University of technology pays for the insurance and transport to JINR
- JINR pays for the housing and daily allowance (around 25$)
- Allows students to write diploma theses based on their projects

Each student:

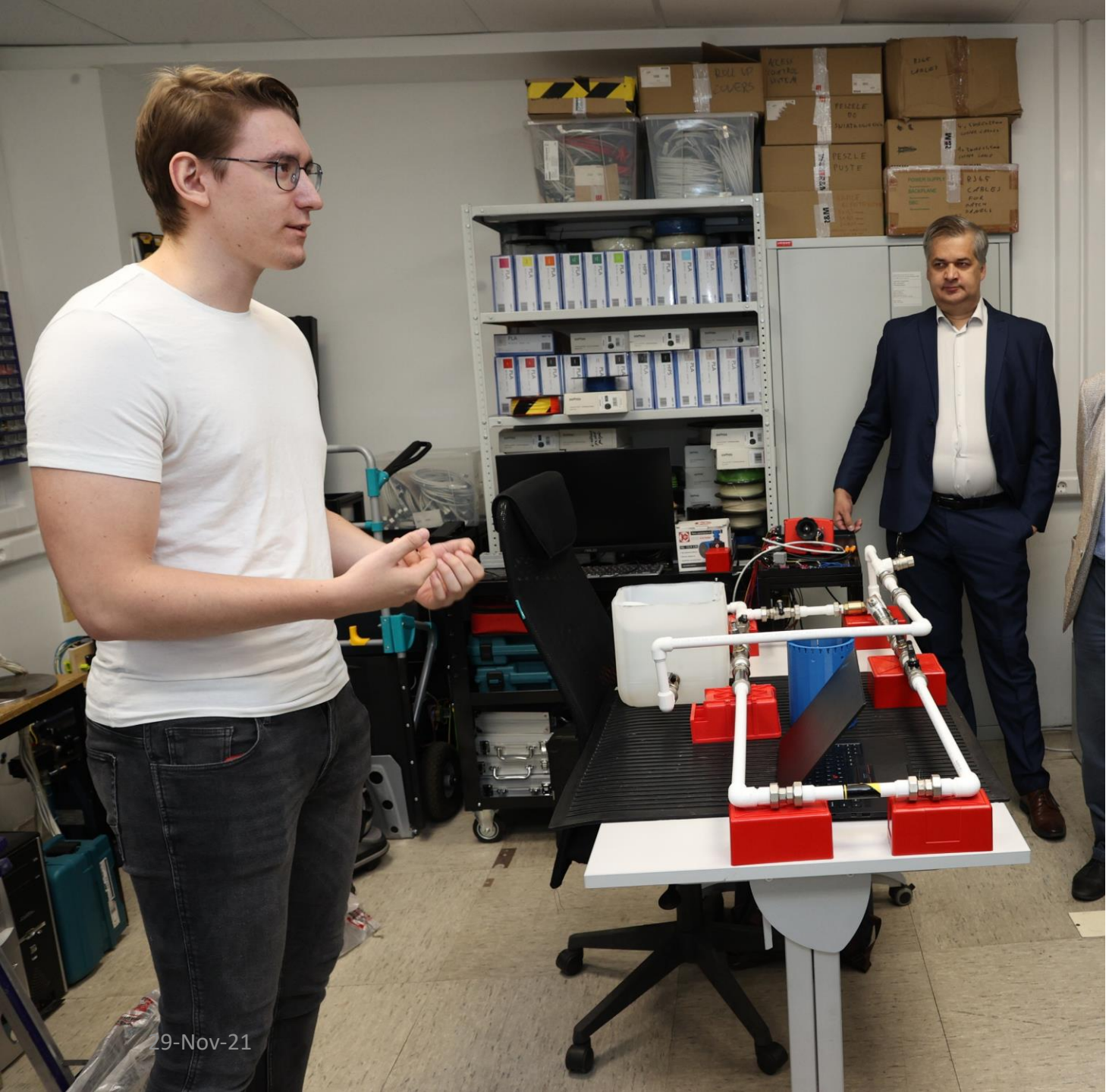
- Receives the certificate after finishing the internship
- Can pass the mandatory internship at WUT using the certificate
- Give presentation in English, at the end of the internship
- Prepares the technical documentation about the project
- Takes part in the conference after the internship (NICA Days or Slow Control Warsaw)

Organization of the internship

- Student receives the individual project and the supervisor
- Each student receives the workplace and is guided by the supervisor how to use the specialized tools
- Help in providing the visa and organizing the transport from and to the airport
- Safety training
- Excursions to the JINR facilities
- Seminar or lecture once per week
- Visit of the Laboratory and/or Institute’s directorate

Topic groups realized during the internships

- Physics for the MPD and BM@N
- Temperature simulations and thermovision
- Software for data analysis from experiments
- Hardware and software for RACKs
- Designing mechanical constructions
- Fire extinguishing system
- Gas systems
- Design of the pump on magnetic bearings
- Robotics



Topic groups realized during the internships

- Equipment Database
- Experiment Control System
- Supervisory Control and Data Acquisition
- Optical fiber laboratory, testing the optical fibers
- 3D printing
- Measuring the magnetic field
- Radiation measurements
- Cryogenics

TeFeNICA in numbers

30 diploma theses defended or being written

More than 120 students took part in the program

More than 100 students from Warsaw University of Technology took part in the program

3 Students from Warsaw University of Technology right now in JINR for a long-term stay

19 publications based on the topics realized during the internship

2021 Team for the Future of NICA internship program

What skills are we looking for?

- B2 level of English (or higher)
- Ability to work independently
- Ability to read technical drawings, P&ID and electrical schemes
- High problem-solving ability
- Preferably basic knowledge of Russian
- Preferably basic knowledge of automatics (especially Siemens' software)

What you need to do to join us?

- Send your CV to tefenica@jinr.ru
- Take part in the interview
- Have passport valid until the end of 2022
- Have all courses passed
- Obtain the consent of the Dean of your Faculty to take part in the program
- Write an application to the Director of Laboratory of High Energy Physics

What do we offer?

- Employment contract
- Possibility to pass the semester while taking part in the program
- Salary (around ~25$ per day)
- Housing
- Health insurance
- Possibility to write the diploma thesis
- Work with the world leading hardware and software

Contact:

http://tefenica.jinr.ru

tefenica@jinr.ru

Sources

- REPORT on preliminary results of the implementation of the Agreement between the Government of the Russian Federation and the international intergovernmental research organization Joint Institute for Nuclear Research on the construction and operation of a complex of superconducting rings on colliding beams of heavy ions NICA (NICA complex) as of 01/01/2020
- TECHNICAL PROJECT OF THE OBJECT "NICA COMPLEX“
- Krystian Rosłon’s and prof. Adam Kisiel’s presentation from VII-th Collaboration Meeting of the MPD Experiment at the NICA Facility

Thank you for your attention