Towards to comprehension of nuclear and radiological education in Belarusian State University

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International seminar: «Organisation of the technical support of the regulatory activities in nuclear and radiation safety»
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Outline

- Bodies and specialties for nuclear and radiological education and training in BSU
- New academic plans
- Learning tools for education and training

Faculties and institutions of BSU involved in nuclear and radiation field

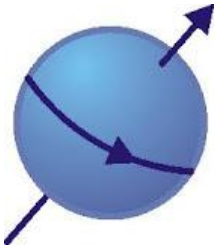
Education and training bodies

- Faculty of Physics
  - Department of Nuclear Physics
  - Department of Solid State Physics (Radiation material science)
  - Department of biophysics
- Faculty of Chemistry
  - Department of Radiation Chemistry and Chemical Pharmaceutical Technologies
- International Sakharov Environmental Institute of BSU
  - Chair of Nuclear and Radiation Safety
  - Chair of Environmental Medicine and Radiobiology
  - Chair of General and Medical Physics

Faculties and institutions of BSU involved in nuclear and radiation field

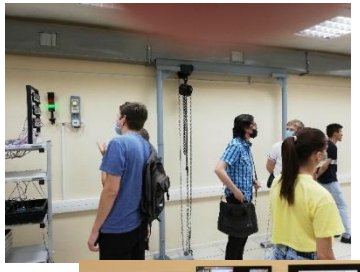
Research institutions and labs

- Institute of Nuclear Problems
  - Lab of Theoretical Physics & Simulation of Nuclear Processes
  - Lab of Analytical Research
- Institute of Applied Physical Problems
  - Lab of Nuclear Gauges
- Institute of Physical and Chemical Problems
  - Lab of Free Radical Processes



Specialties for education and training in nuclear and radiological field

- Undergraduate level
  - *Nuclear Physics and Technologies* – **5,5 years** (Faculty of Physics)
  - *Nuclear and Radiation Safety* – **5 years** (ISEI of BSU)
  - *High Energy Chemistry* – – **5 years** (Faculty of Chemistry)
  - *Medical Physics* – **4 years** (ISEI of BSU)
- Master level
  - *Medical Physics* – **2 years** (ISEI of BSU)
- Post-graduate level
  - *Radiation Protection and Safety of Radiation Sources* – **5,5 months** (ISEI of BSU) with IAEA technical support



New academic plans since 2021

- Peculiarities of the academic plan of specialty "Nuclear Physics and Technologies"

Groups of disciplines related	No of ECTs	
	Old	New
Math, General Physics and Engineering	156	173
Special Nuclear Physics and Engineering	34,5	28
Radiological Physics	17,5	15
Specialism and Internship	89,5	97

- Specialism in:
  - Physics of Nuclear Reactors and Power Reactor Units
  - Nuclear Physics and Electronics
  - Radiation Materials Science

Learning tools for education and training

- Simulator WWER-1000 at the Nuclear Physics Department of Faculty of Physics
- Internet LAB on nuclear reactors at Faculty of Chemistry
- On-line laboratory works on basic nuclear physics, radiation quantities and measurements – Faculty of Physics, ISEI BSU

Simulator WWER-1000

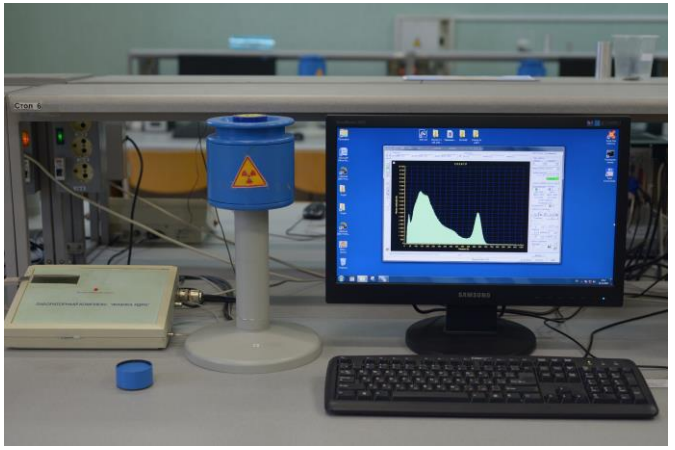
- Simulator provides the opportunity to test all operation modes of the reactor unit with WWER-1000

- More than 20 labs for 6 hours each

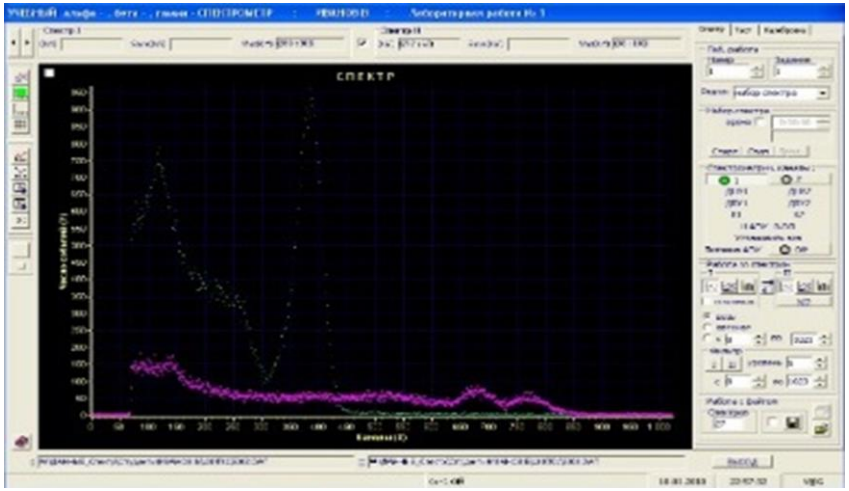
Internet Lab on Nuclear Reactors

- Department of Nuclear Energy of IAEA supports the implementation of laboratory works on research reactor ISIS in France (Saclay) via Internet (distance learning) – since 2016
- Standard set of labs provided

On-line laboratory works on STAR-NET LMS



- On-line lessons can be supervised by instructor for the group of 8 students that implement 4 labs at the moment
- Study pack to each lab work is provided on-line via BSU platform and STAR-NET LMS. It consists of:



- Theoretical background
- Description of the set-up and measurement methodology
- Description of a the MathCad for processing and presenting data
- Preliminary and aftermath questionnaires for admittance and assessment as well

https://www.etrap.net/sites/etrap/files/uploads/ETRAP2021/Proceedings_ETRAP2021_ISBN-9789076971247.pdf (pp. 96 – 104)

Conclusions

- New academic plans are based on the experience gained and done within the opportunities provided
- The experience in implementing e-labs on radiation measurements may be transferred mutatis mutandis on other general and special labs that does not require the practical skills in manipulating equipment

Thank you very much for your attention!!!