

# NEC'2019



Contribution ID: 234

Type: **Sectional**

## Virtual Laboratory –virtual educational tools and hands-on practicum

*Friday 4 October 2019 10:15 (15 minutes)*

Experiments have always been an integral part of the experimental sciences, and are one of the most effective ways to get first-hand knowledge about certain concepts and principles in a study field such as nuclear physics.

The Virtual Lab project (VLab) has a history of several years and now project results are used in the educational process universities in 13 countries. The first stage of the project was devoted to creation of the Virtual Laboratory of Nuclear Fission ([www.v-labs.ru](http://www.v-labs.ru)).

Currently the project is developing in three directions:

- Virtual laboratory of gamma spectroscopy
- Laboratory of detectors and signal processing. Laboratory of data analysis in ROOT
- Preparation and conduct of hands-on practicums for university and high school students

In the framework of the VLab project several hands-on practices were successfully held for university and high school students from different countries. During the practices students started their work with signal generators, oscilloscopes, coincidence circuits, scintillation counters, and finished assembling a simple scintillation telescope that allowed them to register cosmic radiation particles. Then, under supervision of young scientists, students worked with gamma-, X-ray and light ion spectrometers. Attention was given to the analysis of experimental data.

We are very interested to collaborate with teachers and scientists from the JINR Member States and Associate Members to develop the VLab project.

**Primary author:** Mrs KLYGINA, Kseniia (Joint Institute for Nuclear Research, InterGraphics LLC)

**Co-authors:** Mr STREKALOVSKY, Alexandr (Joint Institute for Nuclear Research); WYNGAARDT, Allison (Joint Institute for Nuclear Research); KAMANIN, Dmitry (Joint Institute for Nuclear Research); SIMON, Elena (Hemda Center for Science Education); YARYGIN, Gennady (Joint Institute for Nuclear Research); RAINOVSKI, Georgi (Joint Institute for Nuclear Research); AVERICHEV, Georgy (Joint Institute for Nuclear Research); ISATAYEV, Isatayev (Joint Institute for Nuclear Research); Prof. VANKOV, Ivan (Institute for Nuclear Research and Nuclear Energy, Bulgarian Academy of Sciences); Mr MENDIBAYEV, Kairat (FLNR/Kazakhstan); Mrs VORONTSOVA, Nataliya (Joint Institute for Nuclear Research (JINR)); Mr SIDOROV, Nikita (Joint Institute for Nuclear Research, InterGraphics LLC); KOCHNEV, Pavel (Dubna International University of Nature, Society and Man); SEMCHUKOV, Pavel (Joint Institute for Nuclear Research); SHPITALNIK, Reuven (Hemda Center for Science Education); LUKIANOV, Sergey (Joint Institute for Nuclear Research); Mr PAKULIAK, Stanislav (Joint Institute for Nuclear Research); Ms BELAGA, Victoria (Joint Institute for Nuclear Research); CORDOVA, Yosef (Hemda Center for Science Education); Prof. PANEBRATTSEV, Yuri (Joint Institute for Nuclear Research, InterGraphics LLC)

**Presenter:** Mrs KLYGINA, Kseniia (Joint Institute for Nuclear Research, InterGraphics LLC)

**Session Classification:** Innovative IT Education

**Track Classification:** Innovative IT Education