

**The Institute of Experimental and Applied Physics of the Czech Technical University in Prague (IEAP CTU in Prague - <http://www.utef.cvut.cz>)** was established in 2002 as the CTU's centre for experimental research in subatomic physics and its applications. The long-term strategy of the IEAP CTU in Prague is oriented towards the following research fields:

- particle physics in the framework of the ATLAS experiment on the LHC at CERN (by involvement in both the theory and the development of position sensitive detectors, design of neutron shielding of ATLAS, off-line data analysis and interpretation of the experimental results);
- neutrino physics (theory of and search for the double beta decay with SuperNEMO and TGV experiments in underground laboratory LSM, France);
- astrophysics (participation in the international underground PICASSO and PICO experiments performed at SNOLAB, Sudbury, Canada, devoted to the detection of the neutralino; detection of gamma ray bursts in experiment GROND; terrestrial monitoring of high-energetic components of the cosmic radiation with the CZELTA experiment);
- investigation of the structure of atomic nuclei (spectroscopic study of the medium-mass nuclei by means of neutron- and charged particles-induced reactions, spontaneous fission);
- development of novel types of semiconductor detectors (e.g., R&D of the high granularity position-sensitive semiconductor detecting structures, both pixel and strip types);
- application of detection and spectrometric methods of subatomic physics (high resolution X-ray and neutron radiography and tomography, SPECT, position sensitive X-ray fluorescence analysis, non-destructive material testing, methodological development of the coincidence instrumental activation analysis, development of ultra-sensitive low background techniques);
- the space oriented research of radiation fields along orbits of satellites and of cosmic rays based on integrated systems with pixel detectors (e.g. the SATRAM device with a Timepix detector operating in open space on the PROBA-V satellite for more than 4 years, or seven Timepix radiation monitors (REM), which are used by astronauts on board of the International Space Station - ISS).

In biology and medicine, the ability to image microscopical structures is crucial. In the close collaboration with the Faculty of Biomedical Engineering, CTU in Prague and 1st Faculty of Medicine of Charles University in Prague, the IEAP CTU in Prague develops biomedicine radiographic and tomographic technologies in order to image structures of soft tissues. The image resolution achieved by the team is at the level of several micrometers with the possibility of in-vivo imaging. As an example of success, the team has been awarded by the journal Science in the international competition 10th International Science and Engineering Visualization Challenge. The team won second place in the category photo with their picture of plant seeds combining the X-ray radiography with high resolution and contrast with the pictures from optical microscope (V. Sykora et al., X-ray micro-radiography and microscopy of seeds, Science 339 (2013) 511).

During the 15 years of IEAP CTU in Prague existence, the needed research infrastructure has been built (detector laboratory, electronic laboratory, analytical laboratory, clean rooms, theoretical department, workshop, etc.). The IEAP CTU in Prague also operates the Van de Graaff accelerator, which serves as a tunable source of light energetic ions (protons, deuterons,  $^3\text{He}$ ,  $^4\text{He}$  with accelerating bias from 300 keV up to 2.5 MeV) and fast neutrons providing these particles for specific physics experiments and for advanced calibration of different types of detectors.

Currently, the IEAP CTU in Prague has 68 employees. One third of them are from abroad (Germany, Italy, Slovakia, France, Netherlands, Sweden, Russia, Japan, Colombia, Pakistan, India, Syria).