Cryogenic centre at the Institute of Physics

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About the Project

The ***Cryogenic centre at the Institute of Physics*** project is funded by the **European Regional Development Fund** under the Operational Programme Competitiveness and Cohesion 2014-2020 within the Call ***Investment in organizational reform and infrastructure in the research, development and innovation sector***, KK.01.1.1.02.

The Institute of Physics is one of the leading physics research institutions in the Republic of Croatia. Research in the field of **condensed matter physics and material science** are one of the most important scientific activities at the Institute. The experimental research uses unique cryogenic infrastructure and scientific equipement which enables reaching **very low temperatures and high magnetic fields**. The aim of the KaCIF project is to upgrade and modernize the infrastructure necessary for conducting the top fundamental research of the physical processes and phenomena in condensed matter, as well as applied materials research. The former will ensure the continuity of the present research and open new posibilities, while simultaneously adding to the quality, excellence and competitiveness in scientific research at the international level.

The objectives of the KaCIF project are constituent part of the organizational reform of the Institute of Physics and, in the broader context, of the whole research, development and innovations sector of the Republic of Croatia. In this process new laboratories and technical facilities will be formed: *Department for the research of materials in extreme conditions*, *Cryogenic facility* and *Prototype workshop*.

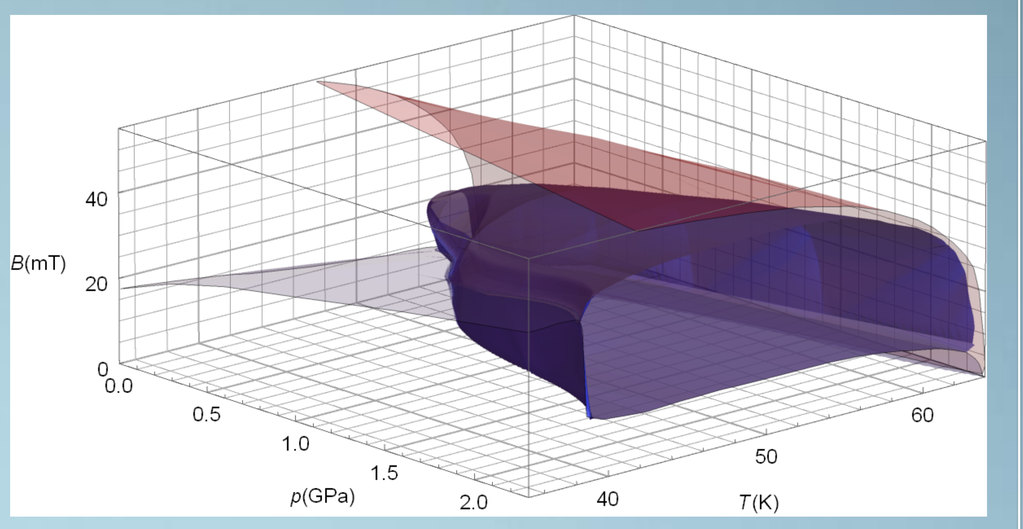
Department for the research of materials in extreme conditions

The KaCIF project will carry out the organizational reform and restructuring of the existing laboratories which conduct research in the field of condensed matter physics and materials science at the Institute of Physics. The existing specialized experimental equipment will be joined by the new state-of-the-art research equipment and new laboratories for the comprehensive investigations of physical phenomena and materials properties will be formed.

The *Department* will be comprised of four laboratories:

- Laboratory for magnetic properties,
- Laboratory for transport and thermodynamic properties,
- Laboratory for extremely low temperatures and high magnetic fields,
- Laboratory for high pressures,

which will specialize for characterization and comprehensive research of specific physical properties of materials in wide range of conditions: **extremely low temperatures (up to ~10 mK), very high magnetic fields (up to 20 T) and high pressures (~10 GPa)**.

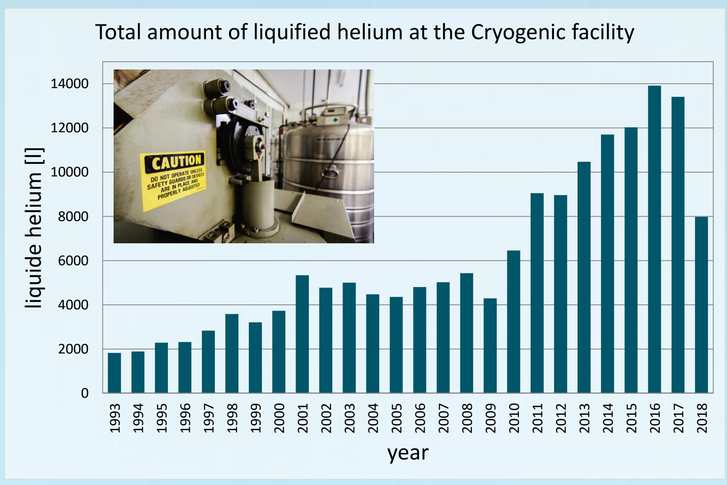


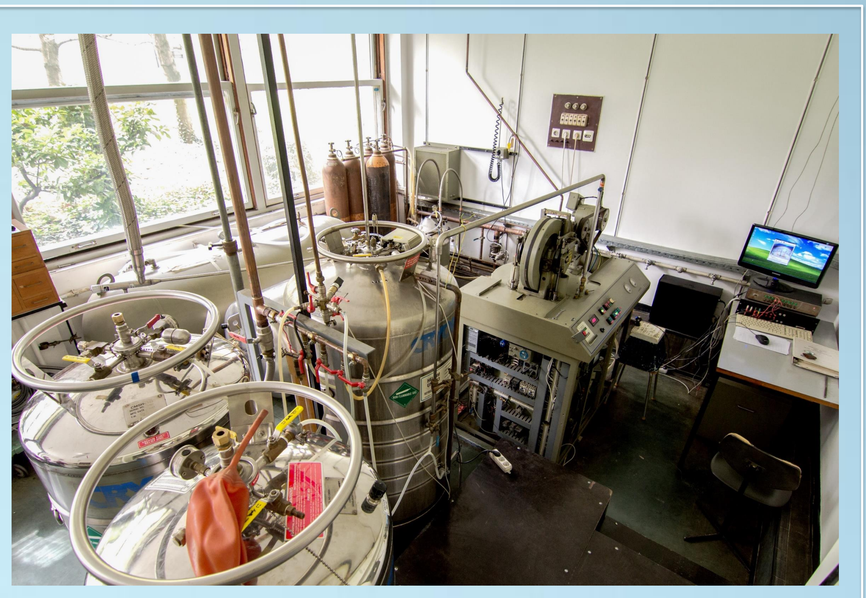
Phase diagram of the magnetoelectric single crystall Cu_2OSeO_3 measured at the Institute of Physics, according to **I. Levatić**, **P. Popčević**, **V. Šurija**, A. Kruchkov, H. Berger, A. Magrez, J. S. White, H. M. Rønnow, **I. Živković**, *Sci. Rep.* 6, 21347 (2016).

Cryogenic facility

Cryogenic facility at the Institute of Physics liquefies helium for scientific research in the low temperature physics in all scientific and scientific-educational institutions in Zagreb since 1969.

The KaCIF project will provide a new modern helium liquefier and upgrade equipment for helium recycling and liquefying. This will ensure sufficient quantities of liquid helium for all existing and future users in Zagreb.





Prototype workshop

The newly formed and equipped *Prototype workshop* will be a center for application of cryogen-free technology in building of measuring devices and developing the technology solutions for the industry.

The Workshop relies on the long tradition and broad experience in building of specialized top performance measuring devices at the Institute of Physics.

The commericial **CryoBIND** high-sensitivity magnetic ac susceptibility measuring device is fully developed at the Institute of Physics.

http://www.cryobind.com

Contact

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