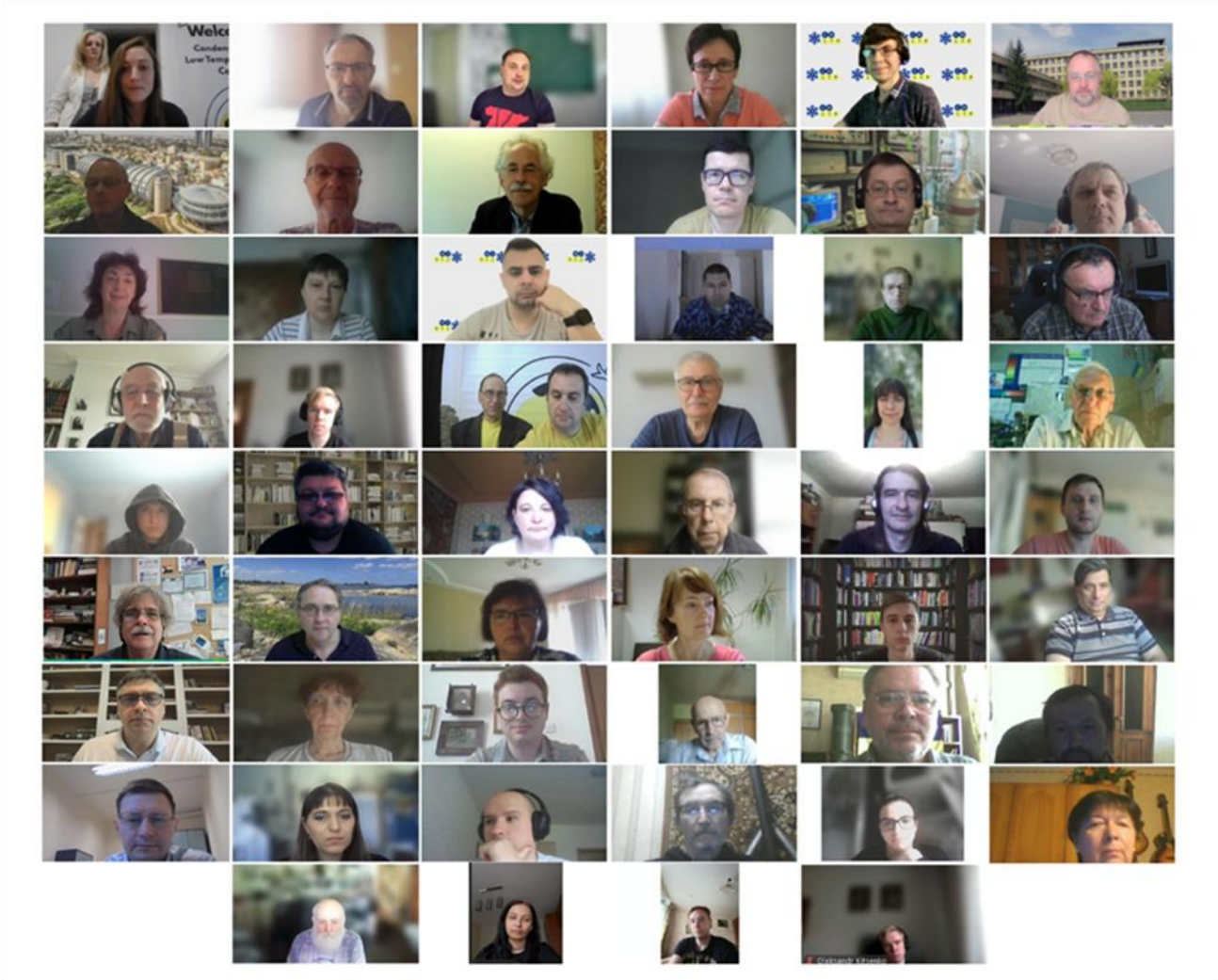
V International Scientific Conference
“Condensed Matter and Low Temperature Physics 2025”
(CM&LTP 2025)

Kharkiv, Ukraine (June 2–6) 2025



V International Scientific Conference, “Condensed Matter and Low Temperature Physics 2025 (CM&LTP 2025)”, took place from 2 to 6 June 2025 at the B. Verkin Institute for Low Temperature Physics and Engineering of the National Academy of Sciences of Ukraine. V International Scientific Conference, “Condensed Matter and Low Temperature Physics 2025” (CM&LTP 2025), took place online.

The conference promoted close scientific communication and the exchange of ideas among highly qualified scientists, including experts in low-temperature and condensed matter physics, as well as early- career researchers. The conference programme covered topical areas of modern experimental and theoretical condensed matter physics, including low-temperature physics, superconductivity, magnetism, optics, nanophysics, biophysics, materials science, and related subjects.

CM&LTP 2025 has traditionally served as a platform for scientists to share their knowledge, exchange new information and ideas, and find co-authors for joint projects.

Scientists from Ukraine and abroad presented 228 oral and poster presentations. The international nature of the conference was emphasised by participants from 21 countries, including Austria, France, the United Kingdom, Israel, Georgia, Finland, the Netherlands, Kazakhstan, Uzbekistan, Poland, Portugal, Romania, Slovakia, Ukraine, Sweden, Hungary, Turkey, Ethiopia, Indonesia, Taiwan, and the USA. Lively discussions during oral and poster sessions

contributed to the exchange of useful information and the development of new ideas, including potential further scientific collaborations.

One of the hottest topics of the conference was the properties of nanostructures: V. V. Kuryliuk and O. Ya. Olikh, "Thermal conductivity of nanoporous silicon: Molecular dynamics simulations and machine learning prediction" (Taras Shevchenko National University of Kyiv, Ukraine); Ju. O. Seti and I. V. Boyko, "Interface phonon spectrum and electron–phonon interaction in GaN/AlGaN nanostructures" (Lviv Polytechnic National University, Ukraine); R. Davies et al., "Kubo conductivity of wires with strong multiparticle backscatterings: A variety of fractions" (School of Engineering & Technology, Aston University, Birmingham, UK; Shamoon College of Engineering, Beer-Sheva, Israel).

Magnetic properties of various systems and high-temperature superconductivity were the subject of several reports: Mykola Krupa, "Information recording medium based on magnetic tunnel junctions" (V. G. Baryakhtar Institute of Magnetism of the National Academy of Sciences of Ukraine); M. Yu. Kovalevsky, "On inhomogeneous equilibrium states in single-sublattice high-spin magnets" (National Science Center "Kharkiv Institute of Physics and Technology" of the National Academy of Sciences of Ukraine); I. R. Metskhvarishvili et al., "Influence of As_2O_2 vapor pressure on phase formation and superconducting properties of Tl-2212 HTS" (Institute of Physics and Technology, Georgia); A. S. Kolisnyk et al., "Study of the influence of a magnetic field up to 9 T on the temperature dependence of the pseudogap in optimally doped $YBa_2Cu_3O_{7-\delta}$ films" (B. Verkin Institute for Low Temperature Physics and Engineering of the National Academy of Sciences of Ukraine).

Nanobiophysics and clusters were the topics of a group of talks: V. V. Maslov and I. M. Pritula, "Peculiarities of oxazine laser dyes in solvents with different polarity and proton donor activity" (O. Ya. Usikov Institute for Radiophysics and Electronics of the National Academy of Sciences of Ukraine); N. V. Khmil, "Effect of ribosomal protein mutation on macrolide binding affinity in Staphylococcus aureus: A molecular docking study" (O. Ya. Usikov Institute for Radiophysics and Electronics of the National Academy of Sciences of Ukraine); K. S. Kuznetsova et al., "Terahertz metasurface sensor with graphene microstrips for biosensing: Modeling and application" (O. Ya. Usikov Institute for Radiophysics and Electronics of the National Academy of Sciences of Ukraine); O. G. Danylchenko and O. P. Konotop, "Competition of close-packed structures in large substrate-free Ar–Kr clusters according to THEED data" (B. Verkin Institute for Low Temperature Physics and Engineering of the National Academy of Sciences of Ukraine); M. Ratner and V. V. Yanovsky, "Phase transitions in large atomic clusters: Computer modeling" (Institute for Single Crystals of the National Academy of Sciences of Ukraine); Yu. S. Doronin et al., "Experimental determination of emission cross sections for electron-induced processes in a supersonic argon jet" (B. Verkin Institute for Low Temperature Physics and Engineering of the National Academy of Sciences of Ukraine).

Glass structure and optical properties of layered crystals, as well as hydrogen sorption by metals, were the topics of the following reports: V. M. Kryshenik et al., "Photo- and thermostimulated phase transformations in $Ge_2Sb_2Se_{5-x}Te_x$ glasses" (Institute of Electron Physics of the National Academy of Sciences of Ukraine); N. Tovstyuk et al., "The ordering of defects controlled by the symmetry of the CdI_2 crystal lattice: Justification and experimental confirmation" (Lviv Polytechnic National University, Ukraine); O. M. Liubymenko and O. A. Shtepa, "Experimental studies on the kinetics of the interaction of hydrogen with palladium in the α-region of the Pd–H diagram" (State Higher Education Institution "Donetsk National Technical University", Ukraine).

It is also worth mentioning the reports dedicated to the mechanical properties of solids: A. A. Horvat et al., "Classical and fractal models of chalcogenide glass viscoelasticity" (Uzhhorod National University, Ukraine); S. V. Lubenets et al., "Normal and reverse indentation size effects in annealed and highly deformed metals" (B. Verkin Institute for Low Temperature Physics and Engineering of the National Academy of Sciences of Ukraine).

We would like to thank all the members of the Program and Organizing Committees for their efforts in the preparation and administration of the conference.

We are grateful to all the authors who submitted articles for this special issue. The number of submissions was so large that some of them will be published in a separate section of the next issue.

The organizers express their sincere gratitude to the Defenders of Ukraine for the opportunity to live, work, and organize such events. Glory to Ukraine!

D. Hurova, A. Dolbin