CURRICULUM VITAE

Yuliia Horbatenko

Affiliation: B.Verkin Institute for Low Temperature Physics and Engineering of the National Academy of Sciences of Ukraine

Position: Researcher

Degree: PhD at low-temperature physics, 07 July 2020, B. Verkin Institute for Low Temperature Physics & Engineering of NAS of Ukraine; ДК № 057608

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Google Scholar:https://scholar.google.com.ua/citations?user=aKqNAeIAAAAJ&hl

EDUCATION

- V. N. Karazin Kharkiv National University, Department of Physics, 2009-2013, Bachelor Sc. in Physics: 1 July, 2013;

- V. N. Karazin Kharkiv National University, Department of Physics, 2013-2014, Master Sc. in Physics: 30 June, 2014;

- B. Verkin Institute for Low Temperature Physics & Engineering of NAS of Ukraine, 1 November 2014 - 31 October 2017, postgraduate course at low-temperature physics.

- PhD at low-temperature physics, 07 July 2020, B. Verkin Institute for Low Temperature Physics & Engineering of NAS of Ukraine;

SCIENTIFIC INTERESTS

The study of thermal properties and heat transfer mechanisms in molecular substances with complex crystal structures is an important area of materials science, which is necessary for development astronautics, modern energy-saving technologies and many applied technical problems, such as the creation of new thermal insulation and thermoelectric materials. Experimental studies of the thermal properties of molecular solids can be used in the development of a theory that connects the features of the thermal conductivity of such crystals with their structure to predict other thermal properties for these crystals, and expand existing ideas about the mechanisms of heat transfer in molecular crystals. Also, the results of the study of thermal conductivity of polymorphic modifications of various molecular crystals are useful in the development of new stable forms of pharmaceutical. The information about the mechanisms of heat transfer also is useful in the creation of elements for thermoelectric systems. In particular, it can be used to create materials with high electrical conductivity and low thermal conductivity, since a controlled change in the thermal conductivity of a material is an important component for improving thermoelectric characteristics and maintaining a high power factor in thermoelectric energy conversion, which is important in the energy, chemical, and pharmaceutical industries.

PUBLICATIONS AND CONFERENCES

1. Temperature dependences of thermal conductivity of solid heterogeneous crystalline and amorphous materials: an empirical approach to the description in the high-temperature region / Y.V. Horbatenko, V.V. Sagan, O.A. Korolyuk, O.O. Romantsova, A.I. Krivchikov // *Low Temperature Physics* **50**(5), 379-388, (2024), https://doi.org/10.1063/10.0025621, **Q3.**

2. Exponential approximation of the coherence contribution to the thermal conductivity of complex clathrate-type crystals / A.I. Krivchikov, Y.V. Horbatenko, O.A. Korolyuk, O.O. Romantsova, O.O. Krivchikov, D. Szewczyk, A. Jeżowski // *Materialia* **32**, 101944 (2023), doi.org/10.1016/j.mtla.2023.101944, **Q1.**

3. Anomalous behavior of thermal conductivity at high temperatures for molecular crystals composed of flexible molecules **/** Y.V. Horbatenko, O.O. Romantsova, O.A. Korolyuk, A. Jeżowski, D. Szewczyk, J.L. Tamarit & A.I. Krivchikov // *Journal of Physics and Chemistry of Solids* **127**, 151-15, (2019), https://doi.org/10.1016/j.jpcs.2018.12.017 **Q2.**

4. Thermoactivated heat transfer mechanism in molecular crystals: Thermal conductivity of benzophenone single crystals / A. Jeżowski, M. A. Strzhemechny, A.I. Krivchikov, O. S. Pyshkin, O. O. Romantsova, O. A. Korolyuk, D. I. Zloba, Yu. V. Horbatenko, A. Filatova // *AIP Advances* **9**(1), 015121 (2019), https://doi.org/10.1063/1.5038676, **Q2.**

5. Glassy anomalies in the low-temperature thermal properties of a minimally disordered crystalline solid / J.F. Gebbia, M.A. Ramos, D. Szewczyk, A. Jezowski, A.I. Krivchikov, Y.V. Horbatenko,... & J.L. Tamarit // *Physical review letters* ***119***(21), 215506, (2017), https://doi.org/10.1103/PhysRevLett.119.215506, **Q1.**

6. Anomalous heat transfer in two polymorphs of para-bromobenzophenone / O.O. Romantsova, Y.V. Horbatenko, A.I. Krivchikov, O.A. Korolyuk, G.A. Vdovichenko, D.I. Zloba, & O.S. Pyshkin // *Low Temperature Physics*, ***43***(3), 395-399, (2017), https://doi.org/10.1063/1.4979956, **Q3.**

7. New thermal conductivity mechanism in triclinic 4-bromobenzophenone crystal / M. A. Strzhemechny, A. I. Krivchikov, A. Jeżowski, …, Yu.V. Horbatenko // *Chemical Physics Letters* **647**, 55–58 (2016), https://doi.org/10.1016/j.cplett.2016.01.001, **Q2.**

8. Features of the temperature dependences of the thermal conductivity of composites and the Meyer Neldel rule / Yu.V. Horbatenko, O.O. Romantsova, A.I. Krivchikov, O.A. Koroluyk // Bogolyubov Kyiv Conference "Problems of Theoretical and Mathematical Physics, Kyiv, Ukraine, 22-25 September, 2024, Abstract book – p. 42.

9. Thermal Conductivity Analysis of Composites with Superlattice Structure / Yu.V.Horbatenko, O.O. Romantsova, A.I. Krivchikov, O.A. Koroluyk // "Condensed Matter and Low Temperature Physics" (CM & LTP-2024"), Kharkiv, Ukraine, 3-7 June 2024, Abstract book - p.196.

10. Thermal conductivity of functional materials formed by the superlattices-type structures / Yu.V.Horbatenko, O.O. Romantsova, A.I. Krivchikov, O.A.Koroluyk // III International Advanced Research Workshop "Thermal Conductivity of solid states at low temperature", B.Verkin Institute for Low Temperature Physics and Engineering NASU, Kharkiv (online), Ukraine, 25 October, 2023, Abstract book – p. 21.

11. Universal temperature dependence of the diffusons contribution to the thermal conductivity of complex clathrate-type crystals / Yu.V. Horbatenko, O.O. Romantsova, A.I. Krivchikov, O.A. Korolyuk, D. Szewczyk, A. Jeżowski, "Condensed Matter and Low Temperature Physics" (CM & LTP-2023)", Kharkiv, Ukraine, 5-11 June 2023, Abstract book - p.109.

12. Thermal conductivity of bulk and nanostructured materials in modern concepts framework / Yu.V. Horbatenko, A.I. Krivchikov, O.O. Romantsova, O.A. Koroluyk // Multiscale Phenomena in Condensed Matter, Krakow (online), Poland, 27-30 June 2022. Abstract book - p.108.

13. Generalized analysis of thermal conductivity for molecular solids / Yu.V. Horbatenko, A.I. Krivchikov // International Advanced Research Workshop "Thermal conductivity of solids states at low temperatures", Kharkiv, Ukraine, 8 June, 2021, Abstract book - p. 30.

14. Thermal conductivity of the glass-like molecular solids / Yu.V. Horbatenko, A.I. Krivchikov // «Multiscale Phenomena in Condensed Matter», Online conference for young researchers, Kraków, Poland, 5-7 July 2021. Abstract book - p.146.

15. Thermal conductivity of molecular crystals formed by flexible molecules / Yu.V. Horbatenko, O.O. Romantsova, A.I. Krivchikov, O.A. Koroluyk // "Condensed Matter and Low Temperature Physics" (CM & LTP 2020"), Kharkiv, Ukraine, 9-12 June 2020. Abstract book - p.88.

16. The thermal conductivity features of molecular crystals formed by flexible molecules / Yu.V. Horbatenko, O.O. Romantsova, A.I. Krivchikov, O.A. Koroluyk // International research and practice conference: "Nanotechnology and nanomaterials (NANO-2020)", 27-30 August, 2020: book of abstr. – Lviv, Ukraine, 2020.

17. Effect of increasing the thermal conductivity of some molecular crystals / Yu.V. Horbatenko, O.O. Romantsova, A.I. Krivchikov, O.A. Koroluyk // International research and practice conference "Clusters and Nanomaterials (CNM-6)", 5-9 October 2020, Uzhgorod, Ukraine.

RESEARCH PROJECTS (R&D) / GRANTS / SCIENTIFIC PROGRAMS

- grant for visiting Institute of Low Temperature and Structure Research (Poland) within the frame of the joint agreement concerning scientific cooperation between The National Academy of Sciences of Ukraine and the Polish Academy of Sciences, related to one-month visits of Ukrainian scientists to Poland - *experimental study of bromosubstituted benzophenones* - (25th August 2018 – 25th September 2018);

- executor; "Phonon interaction in nanomaterials, molecular crystals and quantum liquids"; the project of research works for Young scientists of the National Academy of Sciences of Ukraine, № 0119U102391, 2019-2020;

- executor; NRFU project No 2023.02/0094, "Quatum tunneling of vibrational excitations in thermal conductivity of crystalline and amorphous materials and composites"; NRFU Competition "Leading and Young Scientists Research Support" - scientific research work (2020 - 2023);

- executor; NRFU project No 2023.0/0012, "Low-temperature quantum nanoscale effects in the thermal properties of compacted carbon materials and their composites"; NRFU Competition "Leading and Young Scientists Research Support" - scientific research work (2024 – 2026);

SCIENCE POPULARIZATION:

Participated in the preparation of several workshops with international participation (organizing committee) - International Advanced Research Workshop "Thermal Conductivity of solid states at low temperature" – 8 June 2021; 8-9 October 2022; 25 October 2023, https://ilt.kharkiv.ua/bvi/info/IIId-ITCW-2023/

SCHOLARSHIPS / AWARDS:

- scholarship of the National Academy of Sciences of Ukraine (2019-2021);

- scholarship of the President of Ukraine (2022-2024, 2024-2025).
