NAME: Dr., Prof. Victor Alexeevich Karachevtsev

http://www.ilt.kharkov.ua/site18/index.php?section=people/1karachevtsev&level=1&lang=en

https://scholar.google.com/citations?view_op=list_works&hl=en&user=L67IY7w21p0C

http://orcid.org/0000-0003-4580-6465

Scopus ID 6603867112
Google scholar 1739 citations h=24, Scopus h=21 1383citations

Position: chief scientific researcher

Affiliation: Department of Molecular Biophysics, B. Verkin Institute for Low Temperature Physics and Engineering (ILTPE), National Academy of Sciences of Ukraine (NASU), Kharkiv.

Education: 1972-1977 - Kharkiv State University, Department of Physics, sub-faculty of physical optics, 1980-1984 - post-graduate student at the ILTPE NASU

Degree: 1997 - Doctor of Science (Physics&Mathematics), ILTPE NASU, 1987 - Ph.D. (Physics&Mathematics), ILTPE NASU, 1977 M. Sci., Physics, Kharkiv State University,

2013 - Professor in Phys&Math, 2018 -Corresponding Member of NASU
Under his supervision, 5 candidate's theses and one doctoral theses were defended.

Research area: His research interests concern the functionalization of carbon nanomaterials (nanotubes, graphene oxide, graphene quantum dots) with biopolymers, enzymes, proteins etc., and the development of their applications in biosensing and biomedical field; nanobiophysics, photophysics of carbon nanomaterials; development of nanocomposites based on carbon nanomaterials and 2D transition metal dichalcogenides (MoS_2), spectroscopy of biomolecules at low temperatures, electrical conductivity of composite nanostructures at low temperatures, electrospinning.

Awards: He received the State Award of Ukraine in Science and Technology in 2012 year for series of works “Quantum effects and structural self-organization in new multifunctional nanomaterials”

Head of the scientific work "Nanohybrids of biomolecules, drugs with 2-D nanomaterials: creation, research of physical properties and study of ways of their practical use" 2023-2025. State registration number of work 0123U100628

Publications:

He has co-authored over 172 peer reviewed articles in journals, co-author of the book and Editor of the book.

V.A. Karachevtsev selected publications for last years:

Books

1. Igor A. Levitsky, William B. Euler and Victor A. Karachevtsev Photophysics of Carbon Nanotubes Interfaced with Organic and Inorganic Materials, Springer-Verlag London 2012, 177 p.
2. Nanobiophysics: Fundamentals and Applications, V.A. Karachevtsev (Ed.), Pan Stanford Publishing Pte Ltd., Singapore; 2015, 380 p

Articles:

2025

1. N.V. Kurnosov, A. M. Plokhotnichenko, V.A. Karachevtsev, Temperature-dependent electron transport in a composite film of reduced graphene oxide:MoS2 nanoflakes. Applied Physics A 2025 131(3) DOI: 10.1007/s00339-025-08302-7
2. M. V. Karachevtsev, V.A. Karachevtsev, Temperature-induced flexibility of graphene sheet facilitates RNA duplex unzipping: a molecular dynamics study. AIP Advances 2025 15(1) 7 pages DOI: 10.1063/5.0242561

2024

1. O. Ryazanova, I. Voloshin, I. Dubey, L. Dubey, V. Karachevtsev, Binding of a tricationic meso-substituted porphyrin to poly(A)poly(U): an experimental study. Journal of Fluorescence. (2024). 12 pages https://doi.org/10.1007/s10895-024-04000-4.
2. V. A. Karachevtsev, N. V. Kurnosov, S. G. Stepanian, I. M. Voloshin, O. S. Lytvyn, A. M. Plokhotnichenko, L. Adamowicz, Photoluminescent MoS2 quantum dots surrounded by nucleotides: an experimental and theoretical study. J. Nanopart. Res. 26, 236 (14 pages) (2024) https://doi.org/10.1007/s11051-024-06144-7
3. Glamazda, A. Linnik , O. Lytvyn , and V. Karachevtsev Low-temperature Raman studies of graphene oxide: Analysis of structural properties. AIP Advances 14, 025033 (2024); doi: 10.1063/5.0188838
4. M. V. Karachevtsev, V. A. Valeev, O. S. Lytvyn, V. A. Karachevtsev, Adsorption of poly(rA) in duplex (A-motif) conformation on graphene oxide: spectroscopy and AFM study. Applied Physics A (2024) 130:441 https://doi.org/10.1007/s00339-024-07610-8
5. T. Piddubnyi, S. Stepanian, and V. Karachevtsev IR and Raman markers of the interactions between MoS2 and pyrimidine bases Fizyka Nyzkykh Temperatur/Low Temperature Physics, 2024, Vol. 50, No. 3, pp.210-218
6. M. Plokhotnichenko, V. A. Karachevtsev, and V. A. Pashynska P. O. Kuzema PMMA and PVP blended nanofibers with incorporated antimicrobial agent: spectroscopy and mass spectrometry characterization Fizyka Nyzkykh Temperatur/Low Temperature Physics, 2024, Vol. 50, No. 3, pp.231-238
7. G. I. Dovbeshko, V. A. Karachevtsev VIII International Conference on NANOBIOPHYSICS "Fundamental and Applied Aspects" (NBP–2023) Kyiv, Ukraine, October 3–6, 2023 Fizyka Nyzkykh Temperatur/Low Temperature Physics, 2024, Vol. 50, No. 3, pp.203-204.
8. S. G. Stepanian, V. A. Karachevtsev and L. Adamovicz, Stacked and covalently bonded MoS2-nucleobase complexes: A first-principles study. Chem. Phys. Lett. 2024, vol. 844, 141270 (8 pages) https://doi.org/10.1016/j.cplett.2024.141270

2023

1. Kurnosov, Nikita and Voloshin, Igor and Lytvyn, Oksana and Plokhotnichenko, Aleksandr and Karachevtsev, Victor, MoS2 Quantum Dots and Nanoflakes Exfoliated in Aqueous Solution with Dna/Rna Nucleotides: Spectroscopy and Afm Study. Available at SSRN: https://ssrn.com/abstract=4600166 or http://dx.doi.org/10.2139/ssrn.4600166
2. Usenko, E., Glamazda, A., Svidzerska, A., Valeev V., Laguta A., Petrushenko S., Karachevtsev V. DNA:TiO2 nanoparticle nanoassemblies: effect of temperature and nanoparticle concentration on aggregation. J Nanopart Res 25, 113 (2023). https://doi.org/10.1007/s11051-023-05770-x
3. Usenko E., Svidzerska A., Glamazda A., Valeev V., Laguta A., Karachevtsev V. Thermostability of native DNA bound to TiO2 nanoparticles under physiological-like conditions. Colloid Polym Sci (2023) https://doi.org/10.1007/s00396-023-05175-1

2022

1. A.Yu. Glamazda, A. M. Plokhotnichenko, and V. A. Karachevtsev, Spectroscopy analysis of the alignment of nanoassemblies of DNA-wrapped carbon nanotubes in stretched gelatin film. Low Temperature Physics, 48, No. 4, 324-330 (2022) https://doi.org/10.1063/10.0009732
2. E. Usenko, A. Glamazda, V. Valeev, A. Svidzerska, A. Laguta, S. Petrushenko, V. Karachevtsev. Effect of TiO2 nanoparticles on the thermal stability of native DNA under UV irradiation. Applied Physics A (2022) 128:900 (11 pages) https://doi.org/10.1007/s00339-022-06043-5
3. V.A. Karachevtsev, N.V. Kurnosov, A.M. Plokhotnichenko, Low temperature electrical conductivity of composite film formed by carbon nanotubes with MoS2 flakes. Low Temperature Physics, 48, No. 4, 364-371 (2022) https://doi.org/10.1063/10.0009737
4. A.M. Plokhotnichenko, V.A. Karachevtsev, Electrospinning production of polymer nanofibers containing Ag nanoparticles or carbon nanotubes. Low Temperature Physics, 48, No. 4, 381-386 (2022) https://doi.org/10.1063/10.0009740
5. Yu. Ivanov, S. G. Stepanian, V. A. Karachevtsev and L. Adamovicz Tautomers of 6-thiopurine in low-temperature Ar matrices: FTIR spectroscopy analysis and quantum mechanical calculations. Low Temperature Physics 48, 301 (2022); https://doi.org/10.1063/10.0009734
6. N. Kurnosov, V. Karachevtsev Observation of hole doping of metallic carbon nanotubes contained in unsorted species by Raman spectroscopy. Chemical Physics. 2022. Vol. 563. 111684 (14 pages). https://doi.org/10.1016/j.chemphys.2022.111684
7. M. V. Karachevtsev, S. G. Stepanian, V. A. Valeev, O. S. Lytvyn, L. Adamowicz, V. A. Karachevtsev Adsorption of Polyadenylic Acid on Graphene Oxide: Experiments and Computer Modeling. Journal of Biomolecular Structure and Dynamics. 2022. Vol. 40. №1. 425-437.
8. O.A. Ryazanova, I.M. Voloshin, V.A. Karachevtsev Spectroscopic features of Pheophorbide-a binding to poly-L-lysine. Molecular Crystals and Liquid Crystals 2022. doi.org/10.1080/15421406.2022.2068469

2021

1. V.A. Karachevtsev, S.G. Stepanian, M.V. Karachevtsev, V.A. Valeev, L. Adamowicz. Structural and spectral transformation of cationic porphyrin TMPyP4 at adsorption on graphene. Journal of Molecular Structure 1245 (2021) 131056 (9 pages) https://doi.org/10.1016/j.molstruc.2021.131056
2. Karachevtsev, M.V., Valeev, V.A. & Karachevtsev, V.A. Interaction of double-stranded polynucleotide poly(A:U) with graphene/graphene oxide. Eur. Phys. J. E 44**,** 24 (2021). https://doi.org/10.1140/epje/s10189-021-00030-z
3. N.V. Kurnosov, V.A. Karachevtsev, Composite films of graphene oxide with semiconducting carbon nanotubes: Raman spectroscopy characterization. Low Temperature Physics 41, 227-234 (2021) https://doi.org/10.1063/10.0003520
4. S. G. Stepanian, A. Yu. Ivanov, V. A. Karachevtsev L. Adamowicz. Coronene-uracil complexes embedded in argon matrices: FTIR spectroscopy and quantum-mechanical calculations. Low Temperature Physics, 2021, vol. 47, No. 4, pp. 355–364 https://doi.org/10.1063/10.0003745

2020

1. Kurnosov N., Karachevtsev V. (2020) Temperature Dependence of Conductivity in Composite Film of Single-Walled Carbon Nanotubes with Graphene Oxide. In book: Pogrebnjak A., Bondar O. (eds) Microstructure and Properties of Micro- and Nanoscale Materials, Films, and Coatings (NAP 2019). Springer Proceedings in Physics, vol 240. Springer, Singapore. Chapter 9. pp.79-89 https://doi.org/10.1007/978-981-15-1742-6_9
2. N.V. Kurnosov, A.S. Linnik, V.A. Karachevtsev. Comparison of temperature dependence of electrical conductivity in composite rGO-SWNT film with conductivity in rGO and SWNT films. Low Temperature Physics 46, 346-354 (2020) https://doi.org/10.1063/10.0000700
3. A.Yu. Glamazda, S. G. Stepanian, M. V. Karachevtsev, A. M. Plokhotnichenko, L. Adamowicz, V. A. Karachevtsev Noncovalent interaction of single-walled carbon nanotubes with graphene/graphene oxide: Spectroscopy and theoretical characterizations. Physica E, 124 (2020) 114279, 8 pages https://doi.org/10.1016/j.physe.2020.114279
4. Ryazanova O.A., Zozulya V.N., Voloshin I.M., Dubey L.V., Ilchenko M.M., Dubey I.Ya., Karachevtsev V.A. Pheophorbide-phenazinium conjugate as a fluorescent light-up probe for G-quadruplex structure. Journal of Molecular Structure 1214, 2020, 128218 https://doi.org/10.1016/j.molstruc.2020.128218

5. M. V. Karachevtsev, S. G. Stepanian, L. Adamowicz & V. A. Karachevtsev. Modeling of nucleobase/oligonucleotide interaction with graphene and graphene oxide: the role of charging and/or oxidizing the graphene surface. Molecular Crystals and Liquid Crystals, 697:1, 49-59 (2020), DOI: 10.1080/15421406.2020.1731077
6. Usenko E., Valeev V., Glamazda A., Karachevtsev V. The effect of divalent metal ions on the temperature stability of poly(I:C) duplex. J. of Spectroscopy, 2020 pp. 8850214-1-8850214-7 (2020) https://doi.org/10.1155/2020/8850214
7. Rubin Yu.V, Ivanov A.Yu., Belous L.F., Karachevtsev V.A. Spectral and structural features of bio-composite films of graphene oxide and molybdenum disulphide with molecules of 5-bromouracil and 5-bromo-2'-deoxyuridine. Біофізичний вісник, 43(1), С. 71-84 (2020) https://doi.org/10.26565/2075-3810-2020-43-08

2019

1. V.A. Karachevtsev, N.V. Kurnosov The temperature dependence of electron transport in a composite film of graphene oxide with single-wall carbon nanotubes: an analysis and comparison with a nanotube film. Low Temperature Physics 45, 1109-1118 (2019). https://doi.org/10.1063/1.5125913
2. V.A. Karachevtsev, A.M. Plokhotnichenko, M.V. Karachevtsev, A.S. Linnik, N.V. Kurnosov Composite films of single-walled carbon nanotubes with strong oxidized graphene: characterization with spectroscopy, microscopy, conductivity measurements (5-291 K) and computer modeling. Low Temperature Physics (2019), v. 45, No. 7, pp. 881–891 https://doi.org/10.1063/1.5111303
3. N.V. Kurnosov, V.S. Leontiev, V.A. Karachevtsev, Glutathione influence on the photoluminescence from semiconducting single-walled carbon nanotubes compared with other thiol compounds. Chem.Phys (2019) 516, 218-224 https://doi.org/10.1016/j.chemphys.2018.07.004
4. V. Karachevtsev, N. Kartel, L. Ivanov, A. Lyapunov, O. Nardid, Y. Cherkashina and A. Ivanov, Change in the microviscosity of erythrocyte membranes and proteins in blood plasma after graphene oxide addition: the ESR spectroscopy study. Journal of Spectroscopy (2019) Article ID 8083207, 8 pages https://doi.org/10.1155/2019/8083207
5. O.A. Boryak, V.S. Shelkovsky, M.V. Kosevich, V.V. Orlov, O.M. Vovk, V.A. Karachevtsev Ultrasound-assisted formation of composites of carbon nanotubes with nanosilver. Functional Materials 2019 v.26, 4, p.710-717
6. Karachevtsev M., Stepanian S., Adamowicz L., Karachevtsev V. Interaction of Single Walled Carbon Nanotube with Graphene: Quantum-Chemical Calculation and Molecular Dynamics Study. "Proceedings of the 2019 IEEE 9th International Conference on Nanomaterials: Applications & Properties (NAP-2019)" pp. 02TM12-1-02TM12-4 10.1109/NAP47236.2019.216982
7. Glamazda A., Plokhotnichenko A., Linnik A., Karachevtsev V. Spectroscopic study of SWNT-GO nanohybrids "Proceedings of the 2019 IEEE 9th International Conference on Nanomaterials: Applications & Properties (NAP-2019)" pp. 02NEE13-1-02NEE13-4