Dr Varazdat Stepanyan

Thesis: **Quantum and Classical Phenomena in the Structure of Biopolymers**

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Experience

Oct 2021 – Present
Yerevan State University
Researcher *and lecturer until summer of 2025*
Physics of Macromolecules lab @ RIP, YSU

Jul 2021 – Present
Alikhanyan National Laboratory
Research Fellow *contract*
Quantum Science and Technology lab @ AANL, YerPHI

Jan 2019 – Present
American University of Armenia
Adjunct Lecturer *contract*
Teaching Assistant before Jul 2023

Apr 2022 – Sep 2022
Biosim AI
Research Consultant
Molecular dynamics and drug design

Aug 2020 – Mar 2023
Dasa2
Tutor
Advanced physics and math for high school students

Feb 2018 – Feb 2019
Student Council of YSU
President of the faculty of physics student council
Organizing and conducting student / faculty meetings

Jan 2017 – Feb 2019
Matemat
Full stack web developer
Working on development of major news websites

Awards

Best Master of the Republic of Armenia in the Sphere of IT Award, Second Grade Prize
Issued by The Ministry of Education, Science, Culture and Sports of the Republic of Armenia, Jun 2022

Best Master of Yerevan State University Faculty of Physics Award after First Dean Norayr Qocharyan
Issued by Faculty of Physics of Yerevan State University, Jun 2022

Education

2022 – 2025 **PhD**
Condensed Matter Physics
Yerevan State University

2020 – 2022 **Master of Science**
Diploma with Honour (Red)
Physics of Macromolecules
Yerevan State University

2018 – 2022 **Bachelor of Computer Science**
Computer Science
American University of Armenia

2016 – 2020 **Bachelor of Physics**
Diploma with Honour (Red)
Department of Physics
Yerevan State University

Languages

Armenian	Native
English	Fluent
Russian	Fluent

Courses Taught

Yerevan State University

- Thermodynamics and Molecular Physics
- Nonequilibrium Thermodynamics
- Biophysics
- Optimization

American University of Armenia

- Mechanics
- Math Modeling Applications
- Theory of Computing
- Quantum Computing

Grants and Projects

Higher Education and Science Committee of the Republic of Armenia

- **Quantum analog computing and sensing:** 2024–2027
- **Information theory methods in statistical physics and data science:** 2022–2026
- **Quantum and classical phenomena in the structure of biopolymers:** 2022–2025
- **Quantum information and machine learning: common approaches and tools:** 2021–2023
- **Functional properties of biosensors and structure and hybridization of nucleic acids:** 2021–2022

Reports

- **Conference on Nonextensive Statistical Physics Dedicated to Constantino Tsallis' 82nd Birthday:** (Talk) Negative Thermodynamic Pressure
- **Coarse-graining the finer structure of macromolecular interactions:** (Co-author) The polyelectrolyte with a disorder over short-range interactions
- **QTD2023:** (Poster) Energy Distributions in Quantum Mechanics
- **QTD2022:** (Poster) Photon Cooling: Linear vs Nonlinear
- **HEUREKA2020:** (Talk) NP-complete problems from physics perspective
- **HEUREKA2020:** (Co-author) Quantum classification of even and odd functions as an extention of Deutsch algorithm
- **ANAM2019:** (Talk) Short-range disorder and electrostatic interactions in macromolecule

Publications

- *Negative thermodynamic pressure: No-go theorem and yes-go examples* **Phys. Rev. E** 2025 v. 111, pp. L042105 **doi:10.1103/PhysRevE.111.L042105**
- *No Bose-Einstein Condensation in Closed Systems with Linear Dynamics* **Arm. J. Phys.** 2024 v. 17, pp. 65–70 **doi:10.54503/18291171-2024.17.3-65**
- *Thermodynamics of an Ideal Electron Gas Localized in a Thin Spherical CdSe Nanolayer* **J. Cont. Phys.** 2024 v. 59, pp. 172–178 **doi:10.1134/S1068337224700312**
- *Sequence disorder-induced first order phase transition in confined polyelectrolytes* **J. Chem. Phys.** 2024 v. 161, pp. 134906 **doi:10.1063/5.0228162**
- *Thermal transitions in a one-dimensional, finite-size Ising model* **JSTAT** 2022 v. 3, pp. 033202 **doi:10.1088/1742-5468/ad2679**
- *Energy densities in quantum mechanics* **Quantum** 2024 v. 8, pp. 1223 **doi:10.22331/q-2024-01-10-1223**
- *Photon cooling: Linear versus nonlinear interactions* **Phys. Rev. A** 2022 v. 106, pp. 032214 **doi:10.1103/PhysRevA.106.032214**
- *Helix-Coil Transition in Heterogeneous Biopolymers: Influence of Fixing Bond Scale* **J. Cont. Phys.** 2022 v. 57, pp. 308–312 **doi:10.1134/S1068337222030057**
- *Thermodynamics of Physical Approximations to Non Deterministic Polynomial Complete Problems* **J. Cont. Phys.** 2022 v. 57, pp. 36–40 **doi:10.3103/S1068337222010145**
- *The Rouse Model of Viscoelasticity and Diffusion Behavior of Chromatin* **J. Cont. Phys.** 2020 v. 55, pp. 254–258 **doi:10.3103/S1068337220030123**