



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

Physics of Macromolecules lab @ RIP, YSU

JUL 2021 – PRESENT

Yerevan Physics Institute

Research Fellow

Quantum Science and Technology lab @ AANL, YerPHI

JAN 2019 – PRESENT

American University of Armenia

Adjunct Lecturer

Teaching Assistant before July 2023

APR 2022 – SEP 2022

Biosim AI

Research Consultant

FEB 2018 – FEB 2019

Student Council of the Faculty of Physics

President

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

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

PROJECTS

- **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

- **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 extension 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