

# Yury Polyachenko

THEORETICAL CHEMISTRY PHD CANDIDATE, PRINCETON UNIVERSITY | F1 VISA, CAN USE CPT/OPT OFF-CAMPUS

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## Education

### Princeton University

Princeton, NJ, USA

PH.D. IN CHEMISTRY, SPECIALIZATION IN THEORETICAL CHEMISTRY, GPA: 4.0/4.0 (4.12/4.30)

2022 – 2027

- Multi-scale models of intracellular condensates, Adviser: William M Jacobs (committee: Roberto Car, Mikko Haataja)

### Moscow Institute of Physics and Technology (MIPT)

Moscow, Russia

B.Sc AND M.Sc. IN APPLIED PHYSICS AND MATHEMATICS, SPECIALIZATION IN ATOMIC SIMULATIONS

2017 – 2022

- MSc thesis «Umbrella Sampling analysis of Aerolysin», Adviser: Matteo Dal Peraro (EPFL), GPA 5.0/5.0
- BSc thesis «Molecular-Dynamical model of crystalline Lysozyme», Adviser: Vladimir Stegailov (MIPT), GPA 4.96/5.0

## Experience

### Princeton University, *Theory and simulation of biomolecular self-assembly and soft materials*

Princeton, USA

- COMPUTATIONALLY PREDICTED REGIMES OF BRD4 CONDENSATION ON ACTIVE CHROMATIN [3]; LATER EXPERIMENTALLY CONFIRMED [3]
- SHOWED DEVIATIONS FROM CLASSICAL NUCLEATION THEORY IN BOTH PREFACTOR AND FREE ENERGY AT LOW MOBILITY [4]
- MENTORED 2 UNDERGRADS: H. WATANABE [3] AND A. KOROLEV. **SECURED FULL FUNDING** (\$7825) FOR A PROJECT WITH A. KOROLEV

2022 – Present

### École Polytechnique Fédérale de Lausanne (EPFL), *Laboratory for Biomolecular Modeling*

Lausanne, Switzerland

- BUILT A 1D FREE ENERGY LANDSCAPE FOR AMINO-ACIDS IN AEROLYSIN USING SMD, US, AND SEM METHODS
- DEFINED GROUND-TRUTH BINDING SITE FOR SOLVATED PROTEINS USING MD. BENCHMARKED THE MASIF-SITE AI METHOD FOR DOCKING

2020 – 2022

### MIPT, *Multiscale modeling in soft matter physics*

Moscow, Russia

DEVELOPED A CORRELATOR TO IDENTIFY GAS/LIQ TRANSITION [2], SIMULATED LYSOZYME CRYSTAL, MENTORED 4 UNDERGRADS, TA'D PYTHON

2018 – 2021

## Conferences

### APS March Meeting

Anheim, CA, USA

- YURY POLYACHENKO\***, HANS-FREDERICK WATANABE, ALEXEY KOROLEV, WILLIAM M JACOBS «**PHYSICAL MECHANISMS UNDERLYING SPATIAL TARGETING OF CHROMATIN-ASSOCIATED BIOMOLECULAR CONDENSATES**» // ORAL
- QIWEI YU\*, **YURY POLYACHENKO**, NED S. WINGREEN, MIKKO HAATAJA, WILLIAM JACOBS, ANDREJ KOŠMRLJ «**NUCLEATION PATHWAYS OF MULTICOMPONENT BIOMOLECULAR CONDENSATES**» // POSTER

16–21 Mar. 2025

### APS March Meeting

Minneapolis, MN, USA

- YURY POLYACHENKO\***, HANS-FREDERICK WATANABE, AND WILLIAM M. JACOBS «**MECHANISMS OF SENSITIVE AND SELECTIVE NUCLEATION OF CHROMATIN-ASSOCIATED BIOMOLECULAR CONDENSATES**» // ORAL
- QIWEI YU\*, **YURY POLYACHENKO**, NED S. WINGREEN, MIKKO HAATAJA, WILLIAM JACOBS, ANDREJ KOŠMRLJ «**NUCLEATION PATHWAYS OF MULTICOMPONENT BIOMOLECULAR CONDENSATES: A CAUTIONARY TALE OF THE CLASSICAL NUCLEATION THEORY**» // ORAL

3–8 Mar. 2024

### XXXVII Fortov International Conference on Equations of State for Matter

Kabardino-Balkaria, Russia

POLYACHENKO YU. A.\*, CAO C., DAL-PERARO M., AKSIMENTIEV A. «**COMPARISON OF AEROLYSIN MODIFICATIONS VIA MD**» // ORAL

1–6 Mar. 2022

### XXXVI International Conference on Interaction of Intense Energy Fluxes with Matter

Kabardino-Balkaria, Russia

POLYACHENKO Y. A.\*, KONDRATYUK N. D., STEGAILOV V. V. «**MOLECULAR-DYNAMICAL MODEL OF CRYSTALLINE LYSOZYME**» // ORAL

1–6 Mar. 2021

## Publications & Patents

- Q. Yu\*, **Y. Polyachenko\***, N. S. Wingreen, M. Haataja, A. Kosmrlj, W. M. Jacobs; «Low mobility affects nucleation beyond CNT» *In preparation*
- A. Strom\*, J. Eeftens\*, **Y. Polyachenko\***, C. Weaver, H. Watanabe, [...], W. Jacobs, C. Brangwynne; *MBoC* 2024
- V. Negodin, **Y. Polyachenko**, D. Fleita, V. Pisarev, G. Norman; *J. of Molecular Liquids* 2021
- Co-author** of programs «N-Cement», « $\alpha$ -GeoGaz», « $\beta$ -GeoGaz», registered in the Russian Federal Service for Intellectual Property 2019–2021

## Honors

<b>Awardee</b> , Distinguished Student Program, American Physical Society (APS) March meeting	Minneapolis, MN, USA	Mar. 2024
<b>Recipient</b> , David V. Milligan '62 Fellowship (For excellent grades, \$4000/month)	Princeton, NJ, USA	Jun. – Aug. 2023
<b>Job offer</b> , D.E. Shaw Research, Scientific Associate	New York, USA	Spring 2021
<b>Recipient</b> , MIPT Scholarship for excellence in studies (~ 1.5 minimal wages)	MIPT, Russia	Jan. 2019 – Jun. 2022
<b>Recipient</b> , President scholarship (~ 2 minimal wages)	Russia	Sep. 2017 – Aug. 2021
<b>Awardee</b> , National Russian Physics and Mathematics Olympiads for Undergraduates	Moscow, Russia	2019, 2020
<b>Awardee</b> , 61 <sup>st</sup> , 63 <sup>rd</sup> National Scientific MIPT Conferences	Moscow, Russia	2018, 2020