

BETUL URALCAN



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EDUCATION

- 2019** **Ph.D:** Chemical and Biological Engineering
Princeton University — Princeton, NJ.
Thesis Title: Computer Aided Understanding of Perturbations in Soft Matter Systems
- 2015** **M.A:** Chemical and Biological Engineering
Princeton University — Princeton, NJ.
- 2013** **B.S:** Chemical Engineering
Bogazici University — Istanbul, Turkey.
- Top graduating senior
- 2009** **High School:** Science Track
Uskudar American Academy — Istanbul, Turkey.
- Second-highest-ranked senior

RESEARCH EXPERIENCE

- 2020-** **Assistant Professor**
Bogazici University — Istanbul, TR.
• Soft Matter Laboratory, Polymer Research Center
- 2019-2020** **Research Scientist**
Princeton University — Princeton, NJ.
PIs: Robert K. Prud'homme and Pablo G. Debenedetti
• Characterization of protein structure during nanocarrier encapsulation process.
- 2014 – 2019** **Research Assistant**
Princeton University — Princeton, NJ.
Research Advisor: Pablo G. Debenedetti
• Investigation of the interfacial and capacitive properties of ionic liquid-based electrolytes relevant to energy storage applications using computational and electroanalytical methods.

- Protein thermodynamics and kinetics under environmental perturbations using computational and theoretical techniques rooted in statistical mechanics.
- Computer simulations and theoretical description of the thermophysical properties of water.

TEACHING EXPERIENCE

Spring 2020-22	Lecturer (CHE 222) Introduction to Biosystems
Fall 2020-21	Lecturer (CHE 201) Physical Chemistry I
Fall 2020-22	Lab Coordinator (CHE 203) Physical Chemistry Laboratory
Fall 2016	Assistant in Instruction (CBE 260)* Ethics and Technology: Engineering in the real world
Spring 2015	Assistant in Instruction (CBE 246)* Undergraduate Thermodynamics • Excellence in Teaching award

WORKSHOPS AND CERTIFICATES

- Graduate Certificate in Computational and Information Science, Princeton University, 2016 - 2019.
- Teaching Transcript Program, Princeton University, 2014 -2019.
- European Campus of Excellence (ECE) Summer School on Energy, ETH Zurich, 2013.

HONORS AND AWARDS

- 1st place - Poster Prize at Faraday Discussions on Ionic Liquids, Cambridge, UK, 2017.
- Young Investigator Award at Gordon Conference on Liquids, Holderness, New Hampshire, 2017.
- 3rd place at Gordon Conference on Ionic Liquids, Newry, Maine, 2016.
- 2nd place - Poster Prize, Princeton Center for Complex Materials Poster Competition, Princeton University, 2015.
- Prof. Dr. Turgut Noyan Award for Academic Achievements, Bogazici University, 2013 (valedictorian).
- The Scientific and Technological Research Council of Turkey Research Grant (2209-A) for Undergraduate Students, 2012 -2013.

PROFESSIONAL SERVICE

- Conference co-chair Gordon Research Seminar on Ionic Liquids, 2018.
- Co-organizer and judge at Princeton Center for Complex Materials competition, 2017.
- Referee for Physical Chemistry Chemical Physics, Journal of Physical Chemistry B and Journal of Physical Chemistry Letters, Journal of Chemical Physics.

FUNDED RESEARCH PROJECTS

Lead PI

International Fellowship for Outstanding Researchers (BİDEB-2232):

- Electrical Double Layer Capacitors: From Fundamental Understanding to Design
- November 2019-November 2022

BOUN Scientific Research Projects (SUP):

- Computer-aided Molecular Engineering of Soft Matter Systems
- March 2021 - March 2023

Researcher

ISTKA 2021

- Istanbul Yenilenebilir Enerji Üretim ve Depolama Teknolojileri Arastirma ve Gelistirme Merkezi (RENEW-IST)
- PI: Berat Haznedaroglu
- January 2022 - June 2023

TUBİTAK 1001

- Proteinlerde nadir ara yapılar ve konformasyonel geçiş yolları: İşlevsel Mekanizma ve Hibrit Davranışı Tahmin eden Hibrit Hesapsal Yaklaşımlar
- PI: Turkan Haliloglu
- February 2020 - February 2023

Extreme Science and Engineering Discovery Environment (XSEDE)

- Assisted in the preparation of the proposal "Molecular Simulations of Aqueous Systems with Advanced Sampling" Techniques
- PIs: Pablo G. Debenedetti and Amir Haji-Akbari
- January 2018 – December 2018

VOLUNTEER SERVICE

- Boğaziçi University Engineering Society ICAMES 2021 -Academic committee
- BÜYEM 2021 Winter School for High School Students - lecturer
- TEKNOFEST 2021 – volunteer evaluator
- AIChE Mid-Atlantic Regional Student Conference – co-chair for paper competition, 2018.
- Princeton MedHacks - mentor, 2018.
- Harlem Prep to Princeton Program: Engineers - Outreach, Spring 2017.
- French American School of Princeton: Engineers – Outreach, Spring 2017.
- Engineers Without Borders – graduate student mentor, 2014-2016.
- Student evaluator in a review team of the Association for Evaluation and Accreditation of Engineering Programs (MUDEK), 2013.
- Youth Coordinator at the European Environment and Health Youth Coalition (2010-2012).
- Youth Representative at The European Environment and Health Process of the World Health Organization (2007-2010).

PUBLICATIONS

Refereed Journal Publications

- **B. Uralcan**, S. B. Kim, C. Markwalter, R. K. Prud'homme, P. G. Debenedetti, A Computational Study of the Ionic Liquid-induced Destabilization of the Miniprotein Trpcage, *Journal of Physical Chemistry B*, 22 (21), 5707–5715, (2018).
- **B. Uralcan**, I. Aksay, P. G. Debenedetti, and D. T. Limmer, Concentration Fluctuations and Capacitive Response in Dense Ionic Solutions, *Journal of Physical Chemistry Letters*, 7(13), pp 2333-2338, (2016).
- D. J. Bozym, **B. Uralcan**, D.T. Limmer, M.A. Pope, N.J. Szamreta, P.G. Debenedetti, and I.A. Aksay, Anomalous Capacitance Maximum of the Glassy Carbon Ionic Liquid Interface through Dilution with Organic Solvents. *Journal of Physical Chemistry Letters*, 6(13), 2644-2648, (2015).
- **B. Uralcan**, Folarin Latinwo, P. G. Debenedetti, M. Anisimov, The pattern of property extrema in supercooled and stretched water models as a tool to predict the stability limit of liquid state. *Journal of Chemical Physics*, (accepted, Dec 2018).
- **B. Uralcan**, P. G. Debenedetti, Computational Investigation of the Effect of Pressure on Protein Stability, *Journal of Physical Chemistry Letters*, (accepted, Jan 2019).
- CE Markwalter, **B Uralcan**, I Pelczer, S Zarzhitsky, MH Hecht, Pablo G. Debenedetti, Stability of Protein Structure during Nanocarrier Encapsulation: Insights on Solvent Effects from Simulations and Spectroscopic Analysis, *ACS Nano*, 14(12), 16962-16972, 2020.
- **B Uralcan**, TJ Longo, MA Anisimov, FH Stillinger, PG Debenedetti, Interconversion-controlled liquid–liquid phase separation in a molecular chiral model, *J. Chem. Phys.*, 155 (20), 204502, 2021
- E Can, **B Uralcan**, R Yildirim, Enhancing Charge Transfer in Photocatalytic Hydrogen Production over Dye-Sensitized Pt/TiO₂ by Ionic Liquid Coating, *ACS Appl. Energy Mater.* 4 (10), 10931, 2021.
- **B Uralcan**, Elucidation of Efficient Charge/Discharge Mechanisms in Electrical Double Layer Capacitors, *ACS Appl. Mater. Interfaces*, *in review*.

PRESENTATIONS

- **B. Uralcan**, Elucidation of Efficient Charge/Discharge Mechanisms in Electrical Double Layer Capacitors, International Symposium on Materials for Energy Storage and Conversion, online, 2021 (*oral*).
- **B. Uralcan** and Mikhail Anisimov, Interconversion-Controlled Liquid-Liquid Phase Separation of a Molecular Chiral Model, online, 2020 (*oral*).
- **B. Uralcan** and P. G. Debenedetti, Proteins in Extreme Environments: From Understanding Life to Potential Applications, American Institute of Chemical Engineers Annual Meeting, Pittsburgh, PA, 2018 (*oral*).

- **B. Uralcan** and P. G. Debenedetti, Proteins in Extreme Environments: From Understanding Life to Potential Applications, American Institute of Chemical Engineers Annual Meeting, Pittsburgh, PA, 2018 (*poster*).
- **B. Uralcan**, P. G. Debenedetti, and M. Anisimov, The Pattern of Property Extrema in Supercooled and Stretched Water Models, Symposium on Thermophysical Properties, Boulder, CO, 2018 (*oral*).
- **B. Uralcan**, Advanced Sampling Methods for Protein Folding, Research Computing Day, Princeton, NJ, 2017 (*oral*).
- **B. Uralcan** and P.G. Debenedetti, Investigation of the Effect of Perturbations to the Solvent Environment on Protein Stability, American Institute of Chemical Engineers Annual Meeting, Minneapolis, Minnesota, 2017 (*oral*).
- **B. Uralcan** and P. G. Debenedetti, Computational Investigation of the Stability of the Miniprotein Trp-cage in Ionic Liquids, Faraday Discussions on Ionic Liquids, Cambridge, UK, 2017(*poster competition, 1st place*).
- **B. Uralcan** and P. G. Debenedetti, Investigation of the Effect of Pressure on Protein Stability, Gordon Research Conference on Liquids, Holderness, New Hampshire, 2017 (*oral*).
- **B. Uralcan** and P. G. Debenedetti, Investigation of the Effect of Pressure on Protein Stability, Gordon Research Conference on Liquids, Holderness, New Hampshire, 2017 (*poster competition, young investigator award*).
- **B. Uralcan**, I. Aksay, P. G. Debenedetti, and D. T. Limmer, Concentration Fluctuations and Capacitive Response in Dense Ionic Solutions, Gordon Research Seminar on Ionic Liquids, Newry, Maine, 2016 (*oral*).
- **B. Uralcan**, I. Aksay, P. G. Debenedetti, and D. T. Limmer, Concentration Fluctuations and Capacitive Response in Dense Ionic Solutions, Gordon Research Conference on Ionic Liquids, Newry, Maine, 2016 (*poster competition, 3rd place*).
- **B. Uralcan**, D.T. Limmer, P.G. Debenedetti, and I.A. Aksay, Anomalous Capacitance Maximum of the Glassy Carbon Ionic Liquid Interface through Dilution with Organic Solvents. American Institute of Chemical Engineers Annual Meeting, Salt Lake City, Utah, 2015 (*oral*).
- **B. Uralcan**, D.T. Limmer, P.G. Debenedetti, and I.A. Aksay, Anomalous Capacitance Maximum at Ionic Liquid/Solid Interfaces, Princeton Center for Complex Materials, Princeton University, Princeton, NJ, 2015 (*poster competition, 2nd place*).