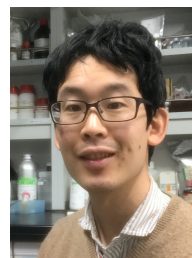


**Yuki Uematsu**, updated January 4, 2025,



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Affiliation: Department of Physics and Information Technology, Kyushu Institute of Technology

Married, a daughter in 2017, a son in 2021, and another daughter in 2024

## I. EDUCATION

- April 2007 – March 2011, Bachelor course in Department of Physics, Kyoto University, Japan.
- April 2011 – March 2013, Master course in Department of Physics, Kyoto University, Japan. Master thesis “Electro-osmotic flow of polyelectrolyte solutions” under supervision of Prof. Takeaki Araki.
- April 2013 – March 2016, Ph. D. course in Department of Physics, Kyoto University, Japan. Ph. D. thesis “Electro-osmosis of polymer solutions: Linear and nonlinear behavior” under supervision of Prof. Takeaki Araki.

## II. EMPLOYMENT

- April 2013 – March 2016, Ph. D. student at Kyoto University (Host: Prof. Takeaki Araki) supported by Japan Society for the Promotion of Science Research Fellowship (DC1).
- April 2016 – January 2019, Post-doctoral researcher at Kyushu University (Host: Prof. Ryo Akiyama) supported by Japan Society for the Promotion of Science Research Fellowship (PD).
  - May 2016 – October 2017, Visiting researcher at Freie Universität Berlin (Host: Prof. Roland R. Netz)
- February 2019 – December 2019, Post-doctoral researcher at Ecole Normale Supérieure (Host: Prof. Lyderic Bocquet) supported by Japan Society for the Promotion of Science Overseas Fellowships.
- October 2019 – March 2022, Assistant professor at Department of Physics, Kyushu University
- April 2022 – November 2024, Associate professor (tenure-track) at Department of Physics and Information Technology, Kyushu Institute of Technology
- December 2024 – present, Associate professor at Department of Physics and Information Technology, Kyushu Institute of Technology

## III. RESEARCH INTEREST

I am interested in physics and chemistry of electrolyte solutions and other charge-related phenomena. By using theoretical and experimental methods, I want to clarify simple physico-chemical mechanism of fascinating phenomena and compare the theory with experiments directly. Specially, interfacial effects such as surface tension, slippage, and electrokinetics are my main targets so far.

## IV. PUBLICATIONS

1. Tomoya Iwashita, [Yuki Uematsu](#), Masahide Terazima, and Ryo Akiyama, Decomposition of Friction Coefficients to Analyze Hydration Effects on a  $C_{60}(OH)_n$ , *J. Chem. Phys.* **161**, 244907 (2024). doi:10.1063/5.0241914
2. [Yuki Uematsu](#), Suguru Iwai, Mariko Konishi, and Shinsuke Inagi, Zeta potentials of cotton membranes in acetonitrile solutions, *Langmuir* **40**, 20294-20301 (2024). doi:10.1021/acs.langmuir.4c02798
3. [Yuki Uematsu](#) and Keiju Suda, Statistical-Mechanical Theory on the Probability Distribution Function for the Net Charge of an Electrolyte Droplet, Part. Part. Syst. Charact. **41**, 2400111 (2024). doi:10.1002/ppsc.202400111

4. Riku Miyazaki, Yasuyuki Kimura, and Yuki Uematsu, Nanobubble-Assisted Formation of Non-Gaseous Nanoparticles in Water, *Physica A* **648**, 129932 (2024). doi:10.1016/j.physa.2024.129932
5. Maximilian Becker, Philip Loche, Majid Rezaei, Amanuel Wolde-Kidan, Yuki Uematsu, Roland R. Netz, and Douwe Jan Bonthuis, Multiscale modeling of aqueous electric double layers, *Chem. Rev.* **124**, 1-26 (2024). doi:10.1021/acs.chemrev.3c00307
6. Haruto Iwasaki, Yasuyuki Kimura, and Yuki Uematsu, Ubiquitous preferential water adsorption to electrodes in water/1-propanol mixtures detected by electrochemical impedance spectroscopy, *J. Phys. Chem. C* **127**, 23382-23389 (2023). doi:10.1021/acs.jpcc.3c05320
7. Sota Inoue, Yasuyuki Kimura, and Yuki Uematsu, Ostwald ripening of aqueous microbubble solutions, *J. Chem. Phys.* **157**, 244704 (2022). doi:10.1063/5.0128696
8. Yuki Uematsu, Analytic theory of nonlinearly coupled electrokinetics in nanochannels, *Phys. Fluids* **34**, 122012 (2022). doi:10.1063/5.0131481
9. Yuki Uematsu and Hiroyuki Ohshima, Electrophoretic mobility of a water-in-oil droplet separately affected by the net charge and surface charge density, *Langmuir* **38**, 4213-4221 (2022). doi:10.1021/acs.langmuir.1c03145
10. Yuki Uematsu, Electrification of water interface, *J. Phys. Condens. Matter* **33**, 423001 (2021). doi:10.1088/1361-648X/ac15d5
11. Majid Rezaei, Bernhard Mitterwallner, Philip Loche, Yuki Uematsu, Roland R. Netz, and Douwe Jan Bonthuis, Interfacial, electroviscous, and nonlinear dielectric effects on electrokinetics at highly charged surfaces, *J. Phys. Chem. B* **125**, 4767-4778 (2021). doi:10.1021/acs.jpcc.0c11280
12. Alexandre dos Santos, Yuki Uematsu, Alexander Rathert, Philip Loche, and Roland Netz, Consistent description of ion-specificity in bulk and at interfaces by solvent implicit simulations and mean-field theory, *J. Chem. Phys.* **153**, 034103 (2020). doi:10.1063/5.001610
13. Yuki Uematsu, Douwe Jan Bonthuis, and Roland R. Netz, Nanomolar surface-active charged impurities account for the zeta potential of hydrophobic surfaces, *Langmuir* **36**, 3645-3658 (2020). doi:10.1021/acs.langmuir.9b03795
14. Philip Loche, Cihan Ayaz, Alexander Schlaich, Yuki Uematsu, and Roland R. Netz, Giant Axial Dielectric Response in Water-Filled Nanotubes and Effective Electrostatic Ion-Ion Interactions from a Tensorial Dielectric Model, *J. Phys. Chem. B*, **123**, 10850-10857, (2019). doi:10.1021/acs.jpcc.9b09269
15. Yuki Uematsu, Douwe J. Bonthuis, and Roland R. Netz, Impurity Effects at Hydrophobic Surfaces Current Opinion in Electrochemistry **13**, 166-173 (2019). doi:10.1016/j.coelec.2018.09.003
16. Yuki Uematsu, Kengo Chida, and Hiroki Matsubara, Intentionally Added Ionic Surfactants Induce Jones-Ray Effect at Air-Water Interface, *Colloid and Interfacial Science Communications* **27**, 45-48 (2018). doi:10.1016/j.colcom.2018.10.003
17. Ram M. Adar, Yuki Uematsu, Shigeyuki Komura, and David Andelman, Linear Response Functions of an Electrolyte Solution in a Uniform Flow, *Phys. Rev. E* **98**, 032604 (2018). doi:10.1103/PhysRevE.98.032604
18. Yuki Uematsu, Roland R. Netz, and Douwe J. Bonthuis, Analytical interfacial layer model for the capacitance and electrokinetics of charged aqueous interfaces, *Langmuir* **34**, 9097-9113 (2018). doi:10.1021/acs.langmuir.7b04171
19. Yuki Uematsu, Roland R. Netz, Lydéric Bocquet, and Douwe J. Bonthuis, Cross-over of the power law exponent for carbon nanotube conductivity as a function of salinity, *J. Phys. Chem. B* **122**, 2992-2997 (2018). doi:10.1021/acs.jpcc.8b01975
20. Yuki Uematsu, Roland R. Netz, and Douwe J. Bonthuis, The effects of ion adsorption on the potential of zero charge and the differential capacitance of charged aqueous interfaces, *J. Phys. Condens. Matter* **30**, 064002 (2018). doi:10.1088/1361-648X/aaa4d4
21. Yuki Uematsu, Douwe J. Bonthuis, and Roland R. Netz, Charged Surface-Active Impurities At Nanomolar Concentration Induce Jones-Ray Effect, *J. Phys. Chem. Lett.* **9**, 189-193 (2018). doi:10.1021/acs.jpcclett.7b02960
22. Yuki Uematsu, Roland R. Netz, and Douwe J. Bonthuis, Power-law electrokinetic behav-

- ior as a direct probe of effective surface viscosity, *Chem. Phys. Lett.* **670**, 11–15 (2017). doi:10.1016/j.cplett.2016.12.056
23. Douwe J. Bonhuis, Yuki Uematsu, and Roland R. Netz, Interfacial Layer Effects on Surface Capacitances and Electro-osmosis in Electrolytes, *Phil. Trans. R. Soc. A* **374**, 20150033 (2016). doi:10.1098/rsta.2015.0033
  24. Yuki Uematsu, Nonlinear Electro-Osmosis of Dilute Non-Adsorbing Polymer Solutions with Low Ionic Strength, *Soft Matter* **11**, 7402-7411 (2015). doi:10.1039/C5SM01507C
  25. Yuki Uematsu, Electrophoresis of Electrically Neutral Porous Spheres Induced by Selective Affinity of Ions, *Phys. Rev. E* **91**, 022303 (2015). doi:10.1103/PhysRevE.91.022303
  26. Yuki Uematsu and Takeaki Araki, Electro-Osmotic Flow of Semidilute Polyelectrolyte Solutions, *J. Chem. Phys.* **139**, 094901 (2013). doi:10.1063/1.4820236
  27. Yuki Uematsu and Takeaki Araki, Effects of Strongly Selective Additives on Volume Phase Transition in Gels, *J. Chem. Phys.* **137**, 024902 (2012). doi:10.1063/1.4732857

## V. AWARD

- March 2023, The 17th Young Scientist Award of the Physical Society of Japan
- January 2021, The 5th Fukui Kenichi Award
- September 2016, Best Presentation Award for Young Researchers at the 67th Divisional Meeting on Colloid and Interface Chemistry of the Chemical Society of Japan
- May 2016, Springer Theses Award

## VI. FUNDING

- **(PI)** April 2024 - March 2025, Grant from The Kao Foundation for Arts and Sciences “Study on the mechanism of electrification in forming emulsions and aerosols” Total 2,000,000 JPY
- **(PI)** April 2023 - March 2026, Grant-in-Aid for Early-Career Scientists “ Experimental study of voltage-induced prewetting transition in mixed solvents” 23K13073, Total 3,500,000 JPY
- April 2022 - March 2025, Grant-in-Aid for Scientific Research C, “Unveiling cooperative effects of hydrogen bonding on the interfacial tension of dilute electrolyte liquids” (PI: Hayato Shiba), 22K03546, Total 1,000,000 JPY
- **(PI)** October 2021 - March 2025, JST Presto “Ionic hydrodynamics in micro- and nano-interfaces” JPMJPR21O2, Total 52,000,000 JPY
- **(PI)** October 2021 - September 2022 Kurita Water and Environment Foundation “Effect of surfactants on the radii dynamics of microbubble solutions” 21E006, Total 500,000 JPY
- **(PI)** April 2021 - March 2022 Kyushu University QR program, “Research on the stability of bubbles by measuring radii dynamics in microbubble solutions”, R3-01302, Total 1,400,000 JPY
- **(PI)** April 2021 - February 2022 The Sasakawa Scientific Research Grant, “Search of non-equilibrium phase separation in ternary systems of water/alcohol/electrolytes under steady electric currents”, 2021-3001, Total 700,000 JPY
- June 2020 – March 2022, Fund for the Promotion of Joint International Research (Fostering Joint International Research (B)), Total 2,000,000 JPY.
- **(PI)** April 2020 – March 2022, Grant-in-Aid for Early-Career Scientists “Revealing the origin of surface charge of hydrophobic interface based on charged impurities”, Total 3,200,000 JPY.
- **(PI)** February 2019 – December 2019, JSPS Fellowship for Research Abroad, “Comprehensive study on fluidic transport of confined electrolytes in nanotubes by theory and experiment”, Total 5,600,000 JPY as maintenance allowance
- **(PI)** April 2016 – March 2019, Grant-in-Aid for JSPS Research Fellows “Study on electrokinetics of electrolyte solutions in nanotubes”, Total 3,400,000 JPY as Grant and 12,308,000 JPY as Salary.
- **(PI)** April 2013 – March 2016, Grant-in-Aid for JSPS Research Fellows “Study on hydrody-

namics and electrostatics of polymer gels with ion and interfacial effects”, Total 2,700,000 JPY as Grant and 7,200,000 JPY as Salary.

#### **VII. TEACHING Experience**

- Experimental Training Class “Physics Experiments” (BZ reaction and Brownian motion, 2019, 2020, 2021).
- Undergraduate Class “Exercises in Electromagnetism” (2020, 2021)
- Undergraduate Class “Thermodynamics” (2022)
- Undergraduate Class “Statistical Mechanics” (2022,2023,2024)
- Graduate Class “Physical Chemistry of Colloid and Interface” (2023, 2024)
- Experimental Training Class “Seminar of Physics and Information Technology” (Colloid physics and chemistry, 2022, 2023, 2024)

#### **VIII. Supervising Experience**

- Bachelor thesis: Sota Inoue (2021), Kenichiro Ide (2022), Haruto Iwasaki (2022), Riku Miyazaki (2022), Keigo Shimizu (2023), Yuto Fujihara (2023), Ryota Shioya (2023), Ayumu Muta (2024), Natsuki Fushitani (2024), Atsushi Tachibana (2024)
- Master thesis: Sota Inoue (2023), Haruto Iwasaki (2024), Riku Miyazaki (2024)