Naruo Ohga

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First-year Ph.D. student at Department of Physics, Graduate School of Science, the University of Tokyo, studying the theoretical aspects of nonequilibrium thermodynamics.

CONTACT & LINKS

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Research map: Link

KEYWORDS

Nonequilibrium thermodynamics, Stochastic thermodynamics, Stochastic processes, Information theory

EDUCATION

The University of Tokyo (Tokyo, Japan), Apr. 2023–present
Doctoral Program, Department of Physics, Graduate School of Science

The University of Tokyo (Tokyo, Japan), Apr. 2021–Mar. 2023
Master's Program, Department of Physics, Graduate School of Science
Degree Title: **Master of Science** (Mar. 23, 2023)
Thesis: "Global structure in information geometry for nonequilibrium thermodynamics and its applications"

The University of Tokyo (Tokyo, Japan), Apr. 2017–Mar. 2021
Bachelor's Program, Physics, Faculty of Science
Degree Title: **Bachelor of Science** (Mar. 18, 2021)
[The School of Science Encouragement Award for the Undergraduate Program]

RESEARCH ARTICLES

PUBLICATIONS

Naruo Ohga, Sosuke Ito, Artemy Kolchinsky
"Thermodynamic Bound on the Asymmetry of Cross-Correlations"
Phys. Rev. Lett. **131**, 077101 (2023). [arXiv:2303.13116]
[Editors' Suggestion] [Highlighted in Physics Magazine Viewpoint] [Press Release (EN/JP)]

Naruo Ohga, Sosuke Ito
"Information-geometric structure for chemical thermodynamics: An explicit construction of dual affine coordinates"
Phys. Rev. E **106**, 044131 (2022). [arXiv:2112.13813]

PREPRINTS

Artemy Kolchinsky, **Naruo Ohga**, Sosuke Ito
"Thermodynamic bound on spectral perturbations"
arXiv:2304.01714 (2023).

Naruo Ohga, Sosuke Ito
"Inferring nonequilibrium thermodynamics from tilted equilibrium using information-geometric Legendre transform"
arXiv:2112.11008 (2021).

PRESENTATIONS

INVITED TALKS

Naruo Ohga
"Universal thermodynamic bounds on two-time correlations" (Oral)

Saito group seminar, Jun. 20, 2023, Kyoto University, Kyoto, Japan.

Naruo Ohga

"Information-geometric duality between nonequilibrium states and tilted equilibrium states" (Oral)
Joint-group meeting between U. Washington (Qian group) and UNC-Chapel Hill (Lu group), Jul. 14th, 2022, University of Washington and UNC-Chapel Hill, US (Online).

INTERNATIONAL CONFERENCES

Naruo Ohga, Sosuke Ito

"Legendre duality between nonstationary and equilibrium entropy and its application to thermodynamic inference" (Oral)
STATPHYS28, Aug. 7–11, 2023, Hongo campus, The University of Tokyo, Tokyo, Japan.

Naruo Ohga

"Thermodynamic bound on the asymmetry of cross-correlations" (Oral)
YITP-YSF Symposium "Perspectives on Non-Equilibrium Statistical Mechanics: The 45th Anniversary Symposium of Yamada Science Foundation," Aug. 3–5, 2023, Panasonic Auditorium, Yukawa Hall, Yukawa Institute for Theoretical Physics, Kyoto University, Kyoto, Japan.

Naruo Ohga

"Universal relations on nonequilibrium entropy in classical fluctuating systems" (Poster)
FoPM International Symposium, Feb. 6–8, 2023, Ito Hall, The University of Tokyo.

Naruo Ohga

"Legendre duality in stochastic thermodynamics: A construction based on information geometry" (Oral)
Workshop on Stochastic Thermodynamics III, May 26–Jun. 3, 2022, Japan (Online).

OTHERS

Naruo Ohga

"Thermodynamic bound on the eigenvalues of the time evolution generator" (Oral)
The 68th Condensed Matter Physics Summer School, Aug. 12–15, 2023, Makino Parkhotel & Seminarhouse, Shiga, Japan.

Naruo Ohga, Sosuke Ito, Artemy Kolchinsky

"Thermodynamic bound on the cross-correlations and its application to oscillatory eigenvalues" (Oral)
2023 Spring Meeting, The Physical Society of Japan, Mar. 22–25, 2023, Japan (Online).

Naruo Ohga

"Thermodynamic bound on the time-reversal symmetry breaking in cross-correlations" (Poster)
The 6th Conference, "Information physics of living matters," Grant-in-Aid for Scientific Research on Innovative Areas, Mar. 6–7, 2023, ACROS Fukuoka International Conference Hall, Fukuoka, Japan.

Naruo Ohga

"Thermodynamic duality between nonequilibrium states and tilted equilibrium states in stochastic systems" (Oral)
The 67th Condensed Matter Physics Summer School, Aug. 2–5, 2022, Japan (Online).

Naruo Ohga

"Thermodynamic duality between nonequilibrium relaxation processes and tilted quasi-static processes in stochastic systems" (Poster)
The 5th Conference, "Information physics of living matters," Grant-in-Aid for Scientific Research on Innovative Areas, Jun. 20–21, 2022, Awaji Yumebutai International Conference Center, Hyogo, Japan.

Naruo Ohga, Sosuke Ito

"Legendre duality in stochastic thermodynamics based on information geometry " (Oral)
2022 Annual Meeting, The Physical Society of Japan, Mar. 15–19, 2022, Japan (Online).

Naruo Ohga, Sosuke Ito

"Information-geometric dual affine coordinates in non-equilibrium chemical thermodynamics" (Oral)
2021 Autumn Meeting, The Physical Society of Japan, Sep. 20–23, 2021, Japan (Online).

Naruo Ohga

"A global structure of stochastic thermodynamics based on dually flat geometry" (Oral)
The 66th Condensed Matter Physics Summer School, Aug. 2–5, 2021, Japan (Online).

Awards & Fellowships

Aug. 2023 Editors' Suggestion, Physical Review Letters

Apr. 2023–Mar. 2026 — Research Fellowship for Young Scientists (DC1), Japan Society for the Promotion of Science (JSPS).

Apr. 2021–Mar. 2026 — Forefront Physics and Mathematics Program to Drive Transformation (FoPM), a World-leading Innovative Graduate Study (WINGS) Program, The University of Tokyo.

Mar. 2021 The School of Science Encouragement Award for the Undergraduate Program, School of Science, The University of Tokyo