

Ray D. Sameshima, Ph.D.

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Academic Appointments

New York Institute of Technology September 2021–Present
Adjunct Assistant Professor, Department of Physics

New York City College of Technology, City University of New York August 2020–Present
Adjunct Assistant Professor, Department of Physics

New York City College of Technology, City University of New York August 2019–August 2020
Adjunct Lecturer, Department of Physics

New York City College of Technology, City University of New York September 2015–August 2019
Graduate Assistant C, Department of Physics

Undergraduate Teaching Experience

New York Institute of Technology, New York City Campus 2021–Present

PHYS 130 Introductory Physics (Laboratory)
PHYS 136 Physics for the Modern Architect
PHYS 150 Introductory Physics II
PHYS 170 General Physics I
PHYS 175 General Physics for Pre-Med I
PHYS 180 General Physics II

Through Spring 2026, 38 sections taught: 13 lectures and 25 laboratories.

New York City College of Technology, City University of New York 2015–Present

PHYS 1433 General Physics I, algebra-based (Lecture and Laboratory)
PHYS 1434 General Physics II, algebra-based (Lecture and Laboratory)
PHYS 1441 General Physics I, calculus-based (Lecture and Laboratory)
PHYS 1442 General Physics II, calculus-based (Laboratory)

Through Spring 2026, 65 sections taught: 11 lectures and 54 laboratories.

The Graduate Center, City University of New York
Teaching Assistant Quantum Mechanics I & II (Graduate-Level)

Selected Lecture Notes and Teaching Materials

- *An Axiomatic Formulation of Thermodynamics in the Spirit of Tasaki*
A lecture note on an operational approach to thermodynamics.
- *A Practical Guide to Writing in Physics Courses*
A student guide to scientific communication, physics solutions, mathematical arguments, and laboratory reports.

Additional lecture notes and instructional materials available at raydsameshima.github.io.

Education

Ph.D., Physics, The Graduate Center, City University of New York 2019

- Dissertation: *On Different Parametrizations of Feynman Integrals*
- Advisors: Andrea Ferrogli and Giovanni Ossola
- CUNY Academic Works dissertation record

M.A., Physics, The City College of New York, CUNY 2013

Graduate Study in Physics and Astronomy, Kyoto University 2009–2011
Division of Physics and Astronomy, Graduate School of Science

B.S., Physics, Kyoto University 2009

Scholarly Publications

Book

1. R. D. Sameshima, *Lectures on Graph Theory: Insights into Feynman Diagrams*. Springer Nature, 2025.
Springer book page

Refereed Journal Articles

1. A. Broggio, A. Ferroglia, G. Ossola, B. D. Pecjak, and R. D. Sameshima, “Associated production of a top pair and a Z boson at the LHC to NNLL accuracy,” *Journal of High Energy Physics* **04**, 105 (2017). arXiv:1702.00800 [hep-ph].
2. S. Adachi *et al.*, “Trigger electronics upgrade of PHENIX muon tracker,” *Nuclear Instruments and Methods in Physics Research A* **703**, 114 (2013).

Other Research Publication

1. M. Sako *et al.*, “Beam energy dependence of charged pion ratio in $^{28}\text{Si} + \text{In}$ reactions,” arXiv:1409.3322 [nucl-ex].

Current Manuscripts

1. R. D. Sameshima, *Associative Measures in Causal Sets*. Manuscript under review.
2. R. D. Sameshima, *From Thermodynamic Accessibility and Composition to Scalar Entropy: Ordered Group Completion and Rigidity*. Manuscript under review.

Selected Presentations

- **Integration-By-Parts-like Identities in Schwinger–Feynman–Lee–Pomeransky Parametrization.**
Phenomenology Symposium, May 2020, online.
- **A Gentle Introduction to Baikov Parametrization.**
PhenoCoffee Seminar, IFIC, Valencia, Spain, June 2018.
- **Functional Reconstruction of Univariate Rational Functions in Haskell.**
AMPLITUDES–SINGULAR Meeting, Padova, Italy, February 2017.
- **Integrand Reduction Reloaded: Algebraic Geometry and Finite Fields.**
American Physical Society Meeting, Washington, DC, 2017.

Research Interests

Feynman integrals and scattering amplitudes; graph-theoretic, algebraic, and analytic methods in quantum field theory. Mathematical foundations of thermodynamics and relativity.

Computational Skills

Mathematica, Maxima, SageMath, Python, SINGULAR; Haskell, Fortran, C/C++; $\text{\LaTeX}$, Git/GitHub.