TUNA YILDIRIM, PhD

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Experience

- **Associate Teaching Professor**, July 2025 - Present
  Arizona State University, Tempe, AZ, USA
  Teaching Quantum Physics I, Math. Methods in Physics I & II,
  General Physics, University Physics I & II, Hist. and Phil. of Science, Econophysics
- **Assistant Teaching Professor**, July 2022 - June 2025
  Arizona State University, Tempe, AZ, USA
- **Instructor**, December 2020 - June 2022
  Arizona State University, Tempe, AZ, USA
- **Faculty Associate**, January 2015 - December 2020
  Arizona State University, Tempe, AZ, USA
- **Visiting Scholar**, August 2014 - May 2015
  Beyond Center for Fundamental Concepts in Science,
  Arizona State University, Tempe, AZ, USA
- **Teaching Assistant**, August 2007 - June 2014
  University of Iowa, Iowa City, IA, USA

Education

- **The University of Iowa**, Iowa City, IA, USA
  - **PhD in Theoretical/Mathematical Physics** — December 2014
  - **MS in Physics** — December 2009
- **Hacettepe University**, Ankara, Turkey
  - **BS in Engineering Physics** — June 2006

Service

- **Faculty Advisor - The Philosopher's Guild** (2024 -)
- **Faculty Advisor - Scholars of Physical Mathematics at ASU** (2023 -)
- **Department of Physics – The Sundial Project – Early Start Program Faculty** (2022 - Present)
- **Department of Physics – Teaching Assistant Training** (2022 - Present)
- **Department of Physics – General Studies Course Committee** (2022 - Present)
- **Department of Physics – Assistant Teaching Professor Search Committee** (2026)
- **Department of Physics – Co-Design Council Committee** (2025)
- **Department of Physics – Instructional Professional Search Committee** (2024-2025)
- **Department of Physics – APS Climate Visit Committee** (2023-2024)
- **Department of Physics – Faculty Open Search Committee** (2022-2023)
- **Department of Physics – Teaching Faculty Search Committee** (2023)
- **Department of Physics – Lab Instructor Search Committee** (2022)
- **Department of Physics – Lab Manual Author – PHY114, PHY132, PHY252** - (2020)

Teaching Experience

Semester	Course Title	Course Number
Fall 2026	Quantum Physics I (Online)	PHY 314
Fall 2026	University Physics I	PHY 121
Fall 2026	University Physics II (Online)	PHY 131
Spring 2026	Quantum Physics I	PHY 314
Spring 2026	Mathematical Methods in Physics II	PHY 201
Spring 2026	University Physics II	PHY 131
Fall 2025	Quantum Physics I (Online)	PHY 314
Fall 2025	Econophysics	PHY 494 / 598
Fall 2025	University Physics II (Online)	PHY 131
Spring 2025	Quantum Physics I	PHY 314
Spring 2025	Mathematical Methods in Physics II	PHY 302
Spring 2025	History and Philosophy of Science	PHY 494 / 598
Fall 2024	Mathematical Methods in Physics I	PHY 201
Fall 2024	University Physics III (Online)	PHY 241
Fall 2024	University Physics II	PHY 131
Summer 2024	General Physics (Online)	PHY111
Spring 2024	Quantum Physics I	PHY 314
Spring 2024	Mathematical Methods in Physics II	PHY 302
Spring 2024	History and Philosophy of Science	PHY 494 / 598
Fall 2023	Mathematical Methods in Physics I	PHY 201
Fall 2023	Econophysics	PHY 494 / 598
Fall 2023	University Physics II	PHY 131
Summer 2023	General Physics (Online)	PHY111
Spring 2023	Quantum Physics I	PHY 314
Spring 2023	University Physics II	PHY 131
Spring 2023	University Physics I	PHY 121
Fall 2022	Econophysics	PHY 494 / 598
Fall 2022	University Physics II	PHY 131
Fall 2022	University Physics I	PHY 121
Spring 2022	Quantum Physics I	PHY 314

Semester	Course Title	Course Number
Spring 2022	University Physics II	PHY 131
Spring 2022	University Physics I	PHY 121
Fall 2021	Physics I	PHY 150
Fall 2021	University Physics II	PHY 131
Fall 2021	University Physics I	PHY 121
Spring 2021	General Physics	PHY 112
Spring 2021	University Physics I	PHY 121
Spring 2021	History and Philosophy of Science	PHY 494 / 598
Fall 2020	University Physics II	PHY 131
Fall 2020	University Physics I	PHY 121
Spring 2020	History and Philosophy of Science	PHY 494 / 598
Spring 2020	General Physics	PHY 112
Fall 2019	University Physics I (Active Learning)	PHY 121
Summer 2019	General Physics Lab	PHY 114
Spring 2019	University Physics I	PHY 121
Spring 2019	University Physics I (Active Learning)	PHY 121
Fall 2018	University Physics I (Active Learning) x 2	PHY 121
Spring 2018	University Physics I	PHY 121
Spring 2018	University Physics I (Active Learning)	PHY 121
Fall 2017	University Physics I (Active Learning) x 2	PHY 121
Summer 2017	General Physics	PHY 112
Summer 2017	General Physics Lab	PHY 114
Spring 2017	University Physics I (Active Learning) x 2	PHY 121
Fall 2016	University Physics I (Active Learning) x 2	PHY 121
Summer 2016	General Physics	PHY 112
Summer 2016	General Physics Lab	PHY 114
Spring 2016	University Physics I (Active Learning)	PHY 121
Fall 2015	University Physics I (Active Learning)	PHY 121
Summer 2015	General Physics	PHY 112
Spring 2015	University Physics I (Active Learning)	PHY 121

- PHY121 - University Physics I: 23 times (14 in active learning style)
- PHY131 - University Physics II: 10 times (2 online)
- PHY241 - University Physics III (Online): 1 time
- PHY314 - Quantum Physics: 7 times (3 in active learning style, 2 online)
- PHY201 - Mathematical Methods in Physics I: 3 times (active learning)
- PHY302 - Mathematical Methods in Physics II: 2 times (active learning)
- PHY112 - General Physics: 5 times
- PHY114 - General Physics Lab: 3 times
- PHY111 - General Physics (Online): 2 times
- PHY494/PHY598 - History and Philosophy of Science: 4 times
- PHY494/PHY598 - Econophysics: 3 times

Mentorship at Arizona State University

✷ The Sundial Project

- **Faculty Facilitator - Summer Program (Early Start)** (2022 -)

✷ Student Clubs Faculty Advisor

- **The Philosopher's Guild** (2024 -)
- **Scholars of Physical Mathematics at ASU** (2023 -)

✷ Teaching Assistant Mentorship

- **Teaching Assistant Training** (2022 -)

✷ Undergraduate Research Students

- **Cara Marie Manlandro,** Arizona State University, 2026-2027
  — "An interactive, case-based learning model for an online History and Philosophy of Science course" (**Honors Thesis**)
- **Justin Hauck-Gilliland,** Arizona State University, 2026-2027
  — "Geometric Quantization of the Harmonic Oscillator" (**Honors Thesis**)
- **Eyan Weissbluth,** Arizona State University, 2024-2026
  — "Impact of Philosophy of Science Classes on Learning in STEM Fields" (**Funded by NASA Space Grant**)
  — "An Analysis of Historical Conceptions of Philosophy of Science: How Ideas of What Science Is Developed From the Enlightenment to the 20th Century" (**Honors Thesis**)
- **Lukas Domer,** Arizona State University, 2024-2026
  — "Exploring Possible Elasticity Theory Applications in General Relativity" (**Honors Thesis**)
- **Joshua Cohon,** Arizona State University, 2024-2026
  — Applications of Finite Strain Elasticity Theory in General Relativity
- **Matthew Fridman,** Arizona State University, 2024
  — Applications of Finite Strain Elasticity Theory in General Relativity

✷ Honors Enrichment Contracts

- **PHY314 - Quantum Physics I**
  — 2022: Grace Connolly, Katlynn Crowe
  — 2023: Hyung Seo Lee, Nicolas Renaud, David Boone
  — 2024: Madison Heldman, Lukas Domer, Erik Orson, Preston Yazzie
  — 2025: Eyan Weissbluth, Jack Condon, Jacob Stefanovski
  — 2026: Rajab El Make, Juan Martinez
- **PHY302 - Math. Methods in Physics II**
  — 2024: Lukas Domer
- **PHY494 - Special Topics: History and Philosophy of Science**
  — 2024: Jacqueline Lehner
- **PHY494 - Special Topics: Econophysics**
  — 2022: Tyler Forgacs
- **PHY131 - University Physics II**
  — 2022: Tanner Schults
  — 2024: AJ Pinto, Harry Tomlinson, Rachel Linker, Elizabeth Biek, Arturo Delgado Navarro

✷ High-school Research Students

- **Dohyun Ku**, Basis Ahwatukee, 2022
  — Econophysics, Philosophy of Science

Mentorship at The University of Iowa

✳ Undergraduate Students

- **Suzanne Squires,** The University of Iowa, 2010-2013
  — Yang-Mills Theory and Chern-Simons Theory
- **Wade Bloomquist**, The University of Iowa, 2013
  — Yang-Mills Theory and Chern-Simons Theory

✳ High-school Students

- **Hart Goldman,** The University of Iowa, 2010-2011
  — Yang-Mills Theory and Chern-Simons Theory

Past Service

- **COGS - UE Local 896 (UIOWA Graduate Assistant Union)**
  Red Area Stewart (2009-2010)
  Member (2009-2014)
- **University of Iowa Hawkeyes on Science Outreach Program**
  Participant (2008-2012)

Awards

- **Outstanding Teaching Professor Award in Natural Sciences** (April 2025)
- **2025-2026 Department of Physics Outstanding Faculty Award** (April 2026)

Workshops

- **AzAAPT** – ASU STEM Teacher Workshop, March 2024

Seminar and Colloquium Talks

- **Arizona State University** – "Chern-Simons Decomposition of 3D Gauge Theories at Large Distances"
  Tempe, AZ, March 2015
- **Arizona State University** – "Topologically Massive Yang-Mills Theory and Link Invariants"
  Tempe, AZ, September 2014
- **Arizona State University** – "A Review of Geometric Quantization"
  Tempe, AZ, September 2014
- **Izmir Institute of Technology** – "Topologically Massive Yang-Mills Theory and Link Invariants"
  Izmir, Turkey, July 2013
- **Middle East Technical University** – "Topologically Massive Yang-Mills Theory and Link Invariants"
  Ankara, Turkey, July 2013
- **Coe College** – "Knot Theory and Physics"
  Cedar Rapids, IA, March 2013

Conference Talks

- **String-Math 2014** – "Topologically Massive Yang-Mills Theory and Link Invariants" Edmonton, AB, 9 - 13 June 2014
- **DPF Meeting 2013** – "Topologically Massive Yang-Mills Theory and Link Invariants" Santa Cruz, CA, 13 - 17 August 2013
- **APS April Meeting 2013** – "Knot Theory and Topologically Massive Yang-Mills Theory" Denver, CO, 13 - 16 April 2013
- **Miami 2012** – "Topologically Massive Yang-Mills Theory and Link Invariants" Ft. Lauderdale, FL, 13 - 20 December 2012
- **XXV Midwest Theory Get-Together** – "Topologically Massive Yang-Mills Theory and Wilson Loops" Argonne National Laboratory, Argonne, IL, 7-8 September 2012
- **Miami 2011** – "Geometric Quantization of Topologically Massive Yang-Mills Theory" Ft. Lauderdale, FL, 15-20 December 2011

Publications

- **"Electrostatic forces and higher order curvature terms of Young–Laplace equation on nanobubble stability in water"**
  Tuna Yildirim, Sudheera Yaparatne, John Graf, Sergi Garcia-Segura and Onur Apul
  NPJ Clean Water (2022) 5:18, https://www.nature.com/articles/s41545-022-00163-4
- **"On Quantum Microstates in the Near Extremal, Near Horizon Kerr Geometry"**
  Ananda Guneratne, Leo Rodriguez, Sujeev Wickramasekara, **Tuna Yildirim**
  J. Phys.: Conf. Ser. 698 012010, 2016, arXiv:1606.03341 [hep-th]
- **"Chern-Simons Splitting of 2+1D Gauge Theories"**
  Tuna Yildirim
  Proceedings of Symposia in Pure Mathematics (PSPUM), 2015, arXiv:1506.08232 [math-ph]
- **"Topologically Massive Yang-Mills Theory and Link Invariants"**
  Tuna Yildirim
  Int. J. Mod. Phys. A, 30(7):1550034, 2015, arXiv:1311.1853 [hep-th]
- **"Topologically Massive Yang-Mills Theory and Link Invariants"**
  Tuna Yildirim
  2014, Ph.D. Thesis, The University of Iowa, ir.uiowa.edu/etd/1519/ , arXiv:1412.4310 [hep-th]
- **"Chern-Simons Splitting of 2+1D Pure Yang-Mills Theory at Large Distances"**
  Tuna Yildirim
  2014, arXiv:1410.8593 [hep-th]
- **"Near-Extremal Kerr AdS2xS2 Solution and Black-Hole/Near-Horizion-CFT Duality"**
  Ananda Guneratne, Leo Rodriguez, Sujeev Wickramasekara, **Tuna Yildirim**
  2012, arXiv: 1206.2261 [hep-th]
- **"A Near Horizon CFT Dual of Kerr-Newman-AdS"**
  Bradly K. Button, Leo Rodriguez, Catherine A. Whiting and **Tuna Yildirim**
  Int. J. Mod. Phys. A 26:3077-3090, 2011. arXiv:1009.1661 [hep-th]
- **"Entropy and Temperature from Black-Hole/Near-Horizon-CFT Duality"**
  Leo Rodriguez and **Tuna Yildirim**
  Class. Quantum Grav. 27 155003, 2010. arXiv:1003.0026 [hep-th]