Morgan H. Lynch

Curriculum Vitae

Education

2017 **Ph.D.**, *The University of Wisconsin-Milwaukee*, Milwaukee, WI
Physics

2011 **M.A.**, *SUNY Stony Brook*, Stony Brook, NY
Physics

2008 **B.S.**, *Angelo State University*, San Angelo, TX
Physics and Mathematics (*Magna Cum Laude*)

Doctoral Thesis

Title *Accelerated Quantum Dynamics*

Academic Experience

2022 **Postdoctoral Researcher**, Seoul National University

2017 - 2021 **Zuckerman Postdoctoral Fellow**, Technion: Israel Institute of Technology

2015 - 2016 **Visiting Graduate Fellow**, Perimeter Institute for Theoretical Physics

2012 - 2017 **Graduate Teaching Assistant**, The University of Wisconsin-Milwaukee
Non-Calculus based introductory physics recitation instructor.
Department tutor.

2013 - 2014 **Graduate Research Assistant**, The University of Wisconsin-Milwaukee
Astroparticle physics under Luis Anchordoqui

2010 - 2012 **Graduate Research Assistant**, SUNY Stony Brook
Relativistic Heavy Ion Group.
Dilepton analysis under Axel Drees.

2009 - 2010 **Graduate Teaching Assistant**, SUNY Stony Brook
Introductory physics laboratory instructor.

2007 **REU**, Vanderbilt University
Theoretical aspects of neutrino oscillations under David Ernst.

2006 **REU**, The University of North Texas
Experimental aspects of field emitting GaN nanoribbons under Jose Perez.

2006 - 2008 **Undergraduate Researcher**, Angelo State University
Independent studies in advanced quantum mechanics & field theory under David Bixler.

2006 - 2008 **Mathematics Dept. Tutor**, Angelo State University
Math Lab tutor.

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Awards & Achievements

2017 **Zuckerman STEM Leadership Fellowship**, Technion: Israel Institute of Technology
Postdoctoral fellowship to work with Prof. Ido Kaminer and Prof. Moti Segev.

2017 **Eli Lubkin Award**, The University of Wisconsin-Milwaukee
Research award for "the physics that isn't being talked about" in memory of Prof. Lubkin.

2016 **Papastamatiou Award**, The University of Wisconsin-Milwaukee
Award for best graduate student in theory

2015 **Visiting Graduate Fellowship**, Perimeter Institute of Theoretical Physics
Visiting fellowship to carry out independent research and collaboration under Niayesh Afshordi

2013 **Summer Research Scholarship**, The University of Wisconsin-Milwaukee
Analysis of astrophysical neutrino sources from IceCube under Luis Anchordoqui.
Resulted in publication.

2008 **Presidential Award**, Angelo State University
Distinguished student award.
Only one offered per year.

2008 **Mathematics MFT Perfect Score**, Angelo State University
Exit exam for math majors.
3rd person ever to obtain a perfect score.

2007 **Carr Research Fellow**, Angelo State University
Scholarship for senior thesis.
Awarded for research in quantum field theory.

2007 **Outstanding Student Presentation Award**, Texas Section of the American Association of Physics Teachers
Presentation on "The Rayleigh-Ritz approximation for a particle in a semi-cicular potential well".

2006 **Outstanding Student Poster Award**, Texas Section of the American Physical Society
Poster on "the field emission properties of GaN nanoribbons".
$200 prize.

Presentations

2021 **Experimental Observation of Acceleration-Induced Thermality**, Invited Seminar to the Quantum Gravity group at the Perimeter Institute
Virtual

2021 **Aspects of Thermalized Radiation Reaction**, Invited Seminar to the CERN Theory Group
Virtual

2021 **A Brief History of Quantum Field Theory in Curved Spacetime**, Invited Colloquium
UW-Milwaukee

2021 **Experimental Observation of Acceleration-Induced Thermality**, 16th Marcel Grossmann Meeting on General Relativity
Virtual

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2020 **A Potential Observation of Acceleration-Induced Thermality**, Seminar at Institute for Theoretical Physics/ São Paulo State University
Virtual

2020 **A Brief History of Quantum Field Theory in Curved Spacetime**, Mathematical Physics Seminar at University of Nottingham
Virtual

2019 **A Brief History of Quantum Field Theory in Curved Spacetime**, Seminar at Aarhus Univesity
Aarhus, Denmark.

2019 **Experimental Evidence for the Unruh Effect (poster)**, The Next Generation of Analogue Gravity Experiments
The Royal Society, London.

2019 **Experimental Evidence for the Radiation Reaction Thermalized at the Fulling-Davis-Unruh Temperature**, 22nd International Conference on General Relativity and Gravitation
Valencia, Spain.

2019 **Experimental Evidence for the Radiation Reaction Thermalized at the Fulling-Davis-Unruh Temperature**, Invited Talk at OSA Conference
Haifa, Israel.

2019 **Quantum Radiation from Electrons in Strong Fields**, CLEO
San Jose, CA.

2018 **Quantum Radiation from Electrons in Strong Fields**, NanoIL conference
Jerusalem, Israel.

2017 **Accelerated Quantum Dynamics and Self-Accelerating Beams**, Colloquium
The University of Wisconsin-Milwaukee.

2016 **Applications of Accelerated Quantum Dynamics to Hadronic Physics**, Nuclear Theory Seminar
SUNY Stony Brook.

2016 **Applications of Accelerated Quantum Dynamics to Hadronic Physics**, High Energy Physics Seminar
University of Illinois at Chicago.

2016 **Temperatures of Renormalizable Quantum Field Theories in Curved Spacetime**, 26th Midwest Relativity Meeting
Perimeter Institute for Theoretical Physics.

2015 **Aspects of Accelerated Quantum Dynamics**, Tufts Cosmology Seminar
Tufts University.

2015 **Aspects of Accelerated Quantum Dynamics**, 25th Midwest Relativity Meeting
Northwestern University.

2014 **Aspects of Acceleration-Induced Field Transitions**, 24th Midwest Relativity Meeting
Oakland University.

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2014 **Aspects of Acceleration-Induced Field Transitions**, The Leonard E. Parker Center for Gravitation, Cosmology, and Astrophysics
The University of Wisconsin-Milwaukee.

2011 **Estimating the Like and Un-like sign Dilepton Detection Asymmetry at PHENIX**, The Relativistic Heavy Ion Group Meeting
SUNY Stony Brook.

2008 **Obtaining the Inverse Square Law from Quantum Field Theory**, The Spring Meeting of the Texas Section of the APS
Corpus Christi, TX.

2007 **The Rayleigh-Ritz Approximation for a Particle in a Semi-circular Potential Well**, The Spring Meeting of the Texas Section of the APS
Abilene Christian University.

2007 **Field Emission Properties of GaN Nanoribbons**, The Fall Meeting of the Texas Section of the APS
The University of Texas at Arlington.

Publications

15 **Gravitational Radiation with Kinetic Recoil**, Morgan H. Lynch
DOI: 10.13140/RG.2.2.34675.60960.

14 **Experimental Observation of Acceleration-Induced Thermality**, Morgan H. Lynch, Eliahu Cohen, Yaron Hadad, and Ido Kaminer
Phys. Rev. D 104, 025015 (2021).

13 **Electromagnetic-Alcubierre Thruster**, Morgan H. Lynch
Int. J. Space Sci. Eng. 6, 113887 (2021).

12 **Resonant Phase-Matching Between a Light Wave and a Free-Electron Wavefunction**, Raphael Dahan et al.
Nat. Phys. 16, 1123 (2020).

11 **Free-Electron Qubits**, Ori Reinhardt, Chen Mechel, Morgan H. Lynch, and Ido Kaminer
Ann. Phys. 533, 200254 (2020).

10 **Quantum Radiation from Electrons in Strong Fields**, Morgan H. Lynch, Ori Reinhardt, Nicholas Rivera, and Ido Kaminer
OSA Tech. Dig. FF3D.7 (2019).

19 **Accelerated-Cherenkov Radiation and Signatures of Radiation Reaction**, Morgan H. Lynch, Eliahu Cohen, Yaron Hadad, and Ido Kaminer
New J. Phys. 21 083038 (2019).

8 **Towards precision measurements of radiation reaction**, Yarden Sheffer, Yaron Hadad, Morgan H. Lynch, and Ido Kaminer
arXiv:1812.10188 [physics.class-ph] (2018).

7 **Temperatures of Renormalizable Quantum Field Theories in Curved Spacetime**, Morgan H. Lynch and Niayesh Afshordi
Class. Quantum Grav. 35, 225008 (2018).

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6 **Electron decay at IceCube**, Morgan H. Lynch
arXiv:1505.04832 [hep-ph] (2015).

5 **A Theory of Accelerated Quantum Dynamics**, Morgan H. Lynch
arXiv:1504.01757 [gr-qc], Essay written for the Gravity Research Foundation 2015 Awards for Essays on Gravitation.

4 **Accelerated Quantum Dynamics**, Morgan H. Lynch
Phys. Rev. D 92, 024019 (2015).

3 **Acceleration-Induced Scalar Field Transitions of N-Particle Multiplicity**, Morgan H. Lynch
Phys. Rev. D 90, 024049 (2014).

2 **Pinning Down the Cosmic Ray Source Mechanism with New IceCube Data**, Luis A. Anchordoqui, Haim Goldberg, Morgan H. Lynch, Angela V. Olinto, Thomas C. Paul, Thomas J. Weiler
Phys. Rev. D 89, 083003 (2014).

1 **Field Emission Properties of ZnO, ZnS and GaN Nanostructures**, Yidong Mo et al.
Springer Series: Lecture Notes in Nanoscale Science and Technology 9. (Springer, New York, 2010) pp. 131-156.

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