

Céleste M.E. Hogan

Curriculum Vitæ

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Areas of Research and Teaching

Areas of Specialization **(Philosophy of) Physics & Metaphysics (Quantum Cosmology, Quantum Gravity, Quantum Foundations, Relativity & Mathematical Physics), Integral Theory & Holistic Science, Process Philosophy, Poststructuralism, Postcolonial & Queer Theory, Philosophy of Science & Religion, Political & Environmental Philosophy.**

Education

- 2011 – 2015 **Doctoral Studies in Theoretical Physics**, *Florida Atlantic University*, Boca Raton, FL.
Dissertation Project: *Dynamics and Symmetry in Quantum Gravity*
Research Advisor: Professor Jonathan S. Engle; Research Co-advisor: Associate Professor Christopher Beetle
- 2009 – 2011 **Master of Science in Physics**, *University of Massachusetts Dartmouth*, Dartmouth, MA.
Thesis: *On the Question of Cosmic Recall in Quantum Cosmology*
Research Advisor: Professor Gaurav Khanna; Research Co-advisor: Chancellor Professor Jong-Ping Hsu
- 2007 **Post-baccalaureate Studies in Physics**, *Ohio University*, Athens, OH.
Research Advisor: Professor Kenneth H. Hicks
- 2003 – 2007 **Bachelor of Arts in Physics & Astronomy**, *Earlham College*, Richmond, IN.
Minor in Mathematics
Advisors: Professor John A. Howell (Physics) and Professor Timothy J. McLarnan (Mathematics)

Schools

- Jul-Aug 2019 **Third L'Agape Summer-School of Theoretical Physics**, *Basic Research Community for Physics (BRCP), Institut de Recherche Mathématique Avancée (IRMA, Université de Strasbourg), and the Centre de Physique Théorique de Luminy (CPT, CNRS, Aix-Marseille Université & Université de Toulon)*, Mézèyrac, Prèsailles, Haute-Loire, France.
- Jul 2019 **Eighth Split Summer School in the Philosophy of Physics ($\Phi \wedge \Phi$): The Chimera of Entropy II**, *John Bell Institute for the Foundations of Physics*, Villa Pingvin, Bojanić Bad, Sveta Nedilja, Hvar, Croatia.
- Jun 2019 **Bard Summer School on Quantum Gravity (BaSS QG)**, *Bard College*, Annandale-on-Hudson, NY.
- Jul 2018 **Seventh Split Summer School in the Philosophy of Physics ($\Phi \wedge \Phi$): The Chimera of Entropy**, *John Bell Institute for the Foundations of Physics & Odjel za Fiziku (Department of Physics), Prirodoslovno matematički fakultet (Faculty of Science), Sveučilište u Splitu (University of Split)*, Split, Croatia (included 2 ECTS credits).
- Jun 2016 **Second Summer School on Emergent Phenomena in Quantum Materials (EPiQM)**, *Laboratory of Atomic and Solid State Physics (LASSP), Department of Physics, Cornell University*, Ithaca, NY.

- Sept 2014 **Third Erlangen Fall School on Quantum Geometry**, *Institut für Quantengravitation, Friedrich-Alexander-Universität Erlangen-Nürnberg*, Erlangen, Germany.
- Oct 2013 **Second Erlangen Fall School on Quantum Geometry**, *Institut für Quantengravitation, Friedrich-Alexander-Universität Erlangen-Nürnberg*, Erlangen, Germany.
- Mar 2011 **Third Quantum Geometry and Quantum Gravity School**, *Uniwersytet Warszawski, Ośrodek Konferencyjno Wypoczynkowy Hyrny, Zakopane*, Poland.
- Oct 2010 **First European-US Summer School on High Performance Computing (HPC) Challenges in Computational Sciences**, *Distributed European Infrastructure for Supercomputing Applications (DEISA) & the National Science Foundation's TeraGrid*, Hotel Santa Tecla Palace, Santa Tecla, Acireale, Sicily, Italy.

Experience

Teaching

- 2020 – present **Lecturer in Physics**, TEXAS TECH UNIVERSITY – COSTA RICA, Escazú, San José, CR.
 Program director of the Department of Physics and Astronomy at the TTU satellite campus in San José. Teaches a 3-3-2 load of physics, astronomy, mathematics, and electrical/industrial engineering courses, conducts research, and serves the University as needed. Coordinates with TTU faculty and administration state-side to further the University's mission in Costa Rica. Funded by Edulink, S.A. (Grupo Huella, Banco Promerica Costa Rica, S.A.) in conjunction with TTU.
 Full-time faculty and sole instructor of record for (at least) eight courses per year:
- ASTR 1400: Solar System Astronomy [Lecture + Lab] (Spring 2022, Spring 2023)
 - MATH 1452: Calculus II with Applications (Fall 2020, Spring 2021, Fall 2021, Fall 2022)
 - MATH 2360: Linear Algebra (Spring 2021, Spring 2023)
 - MATH 2450: Calculus III with Applications (Fall 2021, Fall 2022)
 - MATH 4360: Foundations of Algebra II [Rings, Fields, and Galois Theory] (Fall 2021)
 - PHYS 1408: Principles of Physics I [Lecture + Lab] (Spring 2021, Summer 2021, Spring 2022, Summer 2022, Spring 2023)
 - PHYS 2401: Principles of Physics II [Lecture + Lab] (Fall 2020, Summer 2021, Fall 2021, Summer 2022, Fall 2022)
- Guest lectures:
- MATH 1451: Calculus I with Applications (Fall 2021)
 - MATH 4351: Advanced Calculus II (Fall 2021)
- 2020 – present **Adjunct Faculty**, TEXAS TECH UNIVERSITY, Lubbock, TX.
 Adjunct Instructor, Department of Physics and Astronomy
 Adjunct Instructor, Department of Mathematics and Statistics
 Affiliated Faculty, Institute for Studies in Pragmatism
 Affiliated Faculty, Women's and Gender Studies Program
 Member, STEM Center for Outreach, Research, and Education (STEM CORE)

- 2015 – 2020 **Visiting Lecturer in Mathematics**, WELLS COLLEGE, Aurora, NY.
 Department of Mathematical and Physical Sciences.
 Full-time faculty and sole instructor of record for (at least) three courses per semester for ten semesters:
- MATH 109: Precalculus (Fall 2017)
 - MATH 111: Calculus I: Introduction to Calculus (Spring 2016, Spring 2018, Fall 2018)
 - MATH 112: Calculus II: Introduction to Calculus (Fall 2015, Fall 2016, Spring 2017, Fall 2017, Spring 2019, Fall 2019, Spring 2020)
 - MATH 211: Calculus III: Multivariable Calculus (Fall 2015, Fall 2019)
 - MATH 212: Linear Algebra (Spring 2016, Spring 2017, Spring 2018, Spring 2019, Spring 2020)
 - MATH 213: Ordinary Differential Equations and Applications (Spring 2016)
 - MATH 267: Discrete Mathematics (Fall 2015, Fall 2018)
 - MPS 402: Senior Seminar in Mathematical and Physical Sciences I (Fall 2019)
 - MPS 403: Senior Seminar in Mathematical and Physical Sciences II (Spring 2018)
 - PHYS 106L: Introductory Astronomy [Lecture + Lab] (Spring 2016, Fall 2018)
 - PHYS 212L: Fundamentals of Physics II [Lecture + Lab] (Fall 2016, IS Spring 2018)
 - PHYS 302: Modern Physics (Spring 2017, Spring 2019, Spring 2020)
 - PHYS 395: Tutorial in Physics: Electrodynamics (Spring 2018)
 - SC 101: Philosophy, Cosmology, and Consciousness (Fall 2016, Fall 2017)
- Guest lectures:
- MATH 300: Probability Theory (Spring 2016)
 - MATH 313: Abstract Algebra (Spring 2016)
 - THDA 285: Topics in Theatre or Dance: Connecting Body and Earth (Fall 2015)
 - WGS 245: Body Politics (Fall 2016, Fall 2018)
- Faculty sponsor for six student internships, in CS, BCS, ID, MATH, and PHYS (×2).
- Spring 2015 **Instructor**, MATHNASIUM – THE MATH LEARNING CENTER, Boca Raton, FL.
 Tutor students (K-12) in mathematics ranging from simple arithmetic to precalculus.
- Spring 2015 **Instructor in Physics**, FLORIDA ATLANTIC UNIVERSITY, Boca Raton, FL.
 Department of Physics.
 Part-time faculty and sole instructor of record for the senior seminar:
- PHY 4936: Cosmology
- 2011–2014 **Graduate Teaching Assistant**, FLORIDA ATLANTIC UNIVERSITY, Boca Raton, FL.
 Department of Physics.
- Teaching, grading, and tutoring as instructor of record for three laboratory sections per semester for six semesters (18 sections, 15-20 students per section):
 - PHY 2048L: General Physics Lab 1 (12 sections: 3 sections each for Fall 2011, Spring 2012, and Fall 2012; 2 sections for Fall 2013; 1 section for Spring 2014)
 - PHY 2049L: General Physics Lab 2 (6 sections: 1 section for Fall 2013, 2 sections for Spring 2014, 3 sections for Fall 2014)
 - Grading, tutoring, and proctoring for two terms:
 - PHY 2048: General Physics 1 (Summer 2012, Summer 2014)
- 2009–2011 **Graduate Teaching Assistant**, UNIVERSITY OF MASSACHUSETTS, Dartmouth, MA.
 Department of Physics.
 Teaching, recitation, and grading for three semesters:
- PHY 104: General Physics Lab II (Spring 2011)
 - PHY 111: Physics for Applied Science & Engineering I (Spring 2010)
 - PHY 113: Classical Physics I (Fall 2009)
 - PHY 114: Classical Physics II (Spring 2011)
 - PHY 151: Introductory Astronomy (Spring 2010, Spring 2011)

2004–2007 **Teaching Assistant**, EARLHAM COLLEGE, Richmond, IN.

Departments of Mathematics and Physics & Astronomy.

Teaching, tutoring, and grading for six semesters:

- MATH 180: Calculus A (Fall 2005, Spring 2006, Fall 2006)
- MATH 280: Calculus B (Spring 2007)
- PHYS 120: General Physics I (Fall 2005, Fall 2006)
- PHYS 125: Analytical Physics I (Fall 2004)
- PHYS 230: General Physics II (Spring 2005)
- PHYS 235: Analytical Physics II (Spring 2006, Spring 2007)

Research

Aug 2011 – **Graduate Research Assistant**, FLORIDA ATLANTIC UNIVERSITY, Boca Raton, FL.

May 2015 FAU Spacetime Physics (FAUST) Group, Department of Physics.

Official (*de jure*) RA funding from a NASA–Florida Space Grant Consortium (FSGC) Space Grant for Spring & Summer (Jan–Aug) 2013. Scientific visit to the Horace Hearne Jr. Institute for Theoretical Physics of the Louisiana State University (Baton Rouge, LA), January 2013.

- Background-independent quantum gravity
 - Precisely formulated the concepts of *quantum isotropy* and *dynamical quantum symmetry reduction* within loop quantum gravity and loop quantum cosmology.
 - Studied ‘EPRL’ spinfoam models, spinfoam cosmology, and other background-independent models of quantum gravity and quantum cosmology.
 - Co-authored three papers – published in *Class. Quantum Grav.* (x2) and *Int. J. Mod. Phys. D*.

Aug 2009 – **Graduate Research Assistant**, UNIVERSITY OF MASSACHUSETTS, Dartmouth, MA.

Jul 2011 UMass-URI Gravity Research Consortium (U²GRC), Department of Physics.

Research on loop quantum cosmology, causal dynamical triangulations, and quantum field theory. Partially funded by a NASA–Massachusetts Space Grant Consortium (MASGC) Space Grant and a Foundational Questions Institute (FQXi) Mini-Grant.

- Background-independent quantum gravity
 - Developed techniques to optimize the numerical formulation of the causal dynamical triangulation program in a high-performance computing environment.
 - Analyzed current issues in cosmic recall, decoherence, and the arrow of time.
 - Investigated the stability of singularity resolution solutions in loop quantum cosmology.
- Quantum Field Theory
 - Formulated a gauge-invariant wave function for the photon, including its associated Feynman rules, and applied it to the study of classical diffraction.
 - Co-authored a paper summarizing the results.

Jun–Dec 2007 **Graduate Research Assistant**, OHIO UNIVERSITY, Athens, OH.

Hicks Group, Institute of Nuclear and Particle Physics (INPP), Department of Physics & Astronomy.

- Contributed to the Laser Electron Gamma Source (LEGS) Spin Collaboration, the Laser Electron Photon Experiment at SPring-8 (LEPS) Collaboration, and the CEBAF Large Acceptance Spectrometer (CLAS) Collaboration.
 - Simulated pion tracks within the LEGS time projection chamber (TPC) with CERN's GEANT4 and ROOT software.
 - Analyzed LEPS and CLAS data with CERN's Physics Analysis Workstation (PAW) software and Perl.
- Trained in radiation safety in preparation for a (cancelled) visit to SPring-8 in Sayō, Hyōgo, Japan.

- Jun–Aug 2006 **Research Assistant**, MICHIGAN STATE UNIVERSITY, East Lansing, MI.
National Science Foundation’s Research Experiences for Undergraduates (NSF REU), Department of Physics and Astronomy.
Research on parton distribution functions (PDFs).
 - Studied quantum chromodynamics (QCD).
 - Created PDFs based on data taken from Fermilab’s NuTeV Experiment for the Coordinated Theoretical-Experimental Project on QCD (CTEQ).
 - Analyzed data in Mathematica and FORTRAN, and with the Les Houches Accord PDF Interface (LHAPDF) package.
 - Authored a paper summarizing the results.
- Jun–Aug 2005 **Research Assistant**, OHIO UNIVERSITY, Athens, OH.
 May–Aug 2004 Ohio Musculoskeletal and Neurological Institute (OMNI), Heritage College of Osteopathic Medicine (formerly the Interdisciplinary Institute for Neuromusculoskeletal Research (IINR)).
 - Researched haptic virtual reality systems for the Virtual Haptic Back project.
 - Analyzed, measured, and modeled data sets of the geometry and compliance of human soft tissue with Visage Imaging’s Amira and the SensAble Technologies PHANToM 3.0 haptic interface.
 - Contributed to a study of the basis of the therapeutic effectiveness of counterstrain for Achilles tendinitis and plantar fasciitis via the analysis of electromyographic data sets with the the CED Spike2 data acquisition system, as well as Excel.
 - Contributed to the design of experiments and studies.
- Jul–Aug 2003 **Howard Hughes Medical Institute (HHMI) Fellow**, EARLHAM COLLEGE, Richmond, IN.
Departments of Biology and Physics & Astronomy.
 - Studied the structure and function of the $F_0 - F_1$ ATP synthase molecular motor protein complex (Complex V of the Electron Transport Chain).
 - Learned techniques in molecular biology, such as the Bradford protein assay, as well as the basics of the Protein Data Bank (PDB).
- Apr–Aug 2002 **Research Assistant**, OHIO UNIVERSITY, Athens, OH.
Barbar Group, Department of Chemistry & Biochemistry.
 - Studied the structural biology and assembly of the cytoplasmic dynein molecular motor protein complex.
 - Utilized chromatography, various UNIX protein analysis software, LabVIEW, and Excel.

Selected Publications

Erdős number: 5 (Hogan → Engle → Ashtekar → Jacobson → Kac → Erdős)

(*N.B.: In gr-qc, authors are alphabetically ordered by last name.*)

Invited Journal Articles

C. Beetle, J.S. Engle, **M.E. Hogan**, and P. Mendonça. “Diffeomorphism invariant cosmological symmetry in full quantum gravity.” *International Journal of Modern Physics D* special issue on Loop Quantum Cosmology (Ed. Parampreet Singh), Vol. 25, No. 8 (July 2016) 1642012, DOI:10.1142/S0218271816420128. arXiv:1603.01128 [gr-qc].

Journal Articles

C. Beetle, J.S. Engle, **M.E. Hogan**, and P. Mendonça. “Quantum isotropy and the reduction of dynamics in Bianchi I.” *Classical & Quantum Gravity*, Vol. 38, No. 24 (16 December 2021) 245001, DOI:10.1088/1361-6382/ac337c. arXiv:2102.03901 [gr-qc].

C. Beetle, J.S. Engle, **M.E. Hogan**, and P. Mendonça. “Diffeomorphism invariant cosmological sector in loop quantum gravity.” *Classical & Quantum Gravity*, Vol. 34, No. 22 (23 November 2017) 225009, DOI:10.1088/1361-6382/aa89c6. arXiv:1706.02424 [gr-qc].

Other

M.E. Hogan. “Holistic quantum relationalism.” In preparation.

M.E. Hogan. “Meta-theoretic quantum gravity: dualities, convergences, and embeddings.” In preparation.

M.E. Hogan. “On the Question of Cosmic Recall in Quantum Cosmology.” M.Sc. thesis, University of Massachusetts Dartmouth, 2011.

S.H. Kim, **M.E. Hogan**, P. Mendonça, A. Kumar, D. Katz, J. Westgate, and J.-P. Hsu. “Gauge-Invariant Vector Wave Function for Photons.” Submitted to *Physical Review A*.

M.E. Hogan. “Parton Distributions and Neutrino Scattering: Uncertainties of Global QCD Analysis.” Internal report, Michigan State University, 2006.

Selected Programming Languages & Software

Basic UNIX, ROOT, GEANT4, PAW, PERL, FORTRAN, JavaScript, CSS, MATLAB, LabVIEW
Intermediate Linux, C++, PYTHON, BASIC, L^AT_EX, HTML, Mathematica, Maple, Adobe Creative Suite

Selected Presentations

- Feb 2023 “*philosophia naturalis*: Making Sense of Relations and Realities”. Discussion Chair & invited talk. 2023 American Philosophical Association Central Division Meeting, Hilton Denver City Center, Denver, CO.
- Mar 2022 “Creativity and Discovery in Sciences” (with N. Akchurin and E. Bisanz). Invited colloquium. Texas Tech University Institute for Studies in Pragmatism’s Cross-Disciplinary Doctoral Colloquium.
- Feb 2022 “Quantum Isotropy and the Reduction of Dynamics in Bianchi I”. Invited lecture. 9th Tux Workshop on Quantum Gravity, virtual (Universität Paderborn and Uniwersytet Warszawski, Tux, Tyrol, Austria).
- Nov 2021 “Quantum Geometry and the Canonical Quantization of Gauge Theories”. Invited seminar. Texas Tech University Department of Mathematics & Statistics Probability, Differential Geometry, and Mathematical Physics (PDGMP) Seminar.
- Oct 2021 “Quantum Cosmology and Holistic Quantum Relationalism”. Invited colloquium. Texas Tech University Institute for Studies in Pragmatism’s Cross-Disciplinary Doctoral Colloquium.
- Jul 2021 “An Introduction to (Loop) Quantum Cosmology”. Invited colloquium. Texas Tech University Institute for Studies in Pragmatism’s Cross-Disciplinary Doctoral Colloquium.
- Apr 2021 “Quantum Isotropy and the Reduction of Dynamics in Bianchi I.” Lecture. Joint Spring 2021 Meeting of the Texas Sections of the American Physical Society (TSAPS), American Association of Physics Teachers (TSAAPT), and the Society of Physics Students (TSSPS), virtual (Texas A&M University – Corpus Christi, Corpus Christi, TX).
- Apr 2021 “Quantum isotropy and dynamical quantum symmetry reduction.” Invited colloquium. Texas Tech University Institute for Studies in Pragmatism’s Cross-Disciplinary Doctoral Colloquium.
- Mar 2021 “An Introduction to Loop Quantum Cosmology (for Astrophysicists)”. Invited seminar. Texas Tech University Astrophysics Group.
- Nov 2020 “What happened before the Big Bang?” Invited seminar. Texas Tech University – Costa Rica Faculty Seminar Series.

- Jul-Aug 2019 “Commutative diagrams for quantum cosmology” (lecture) and “The Chimera of Entropy” (discussion session, with I. Kotecha). Third L’Agape Summer-School of Theoretical Physics, Basic Research Community for Physics (BRCP), Institut de Recherche Mathématique Avancée (IRMA, Université de Strasbourg), and the Centre de Physique Théorique de Luminy (CPT, CNRS, Aix-Marseille Université & Université de Toulon), Mézeryrac, Présailles, Haute-Loire, France. Featured in the newspaper *L’Éveil de la Haute-Loire* (29 July 2019), and on the France 3 Auvergne-Rhône-Alpes TV program “JT 12/13 Auvergne” (3 August 2019).
- Jun 2019 “Commutative diagrams for quantum cosmology.” Lecture. IGC@25: The Multimessenger Universe, Institute for Gravitation and the Cosmos, The Pennsylvania State University, University Park, PA.
- May 2019 “Commutative diagrams for quantum cosmology.” Lecture. EGM22 – 22nd Eastern Gravity Meeting, Department of Mathematics, Department of Physics, and Center for Scientific Computing and Visualization Research, University of Massachusetts Dartmouth, Dartmouth, MA. *Chaperoned a group of Wells College students.*
- Jun 2017 “Diffeomorphism invariant cosmological sector in loop quantum gravity.” Lecture. EGM20 – 20th Eastern Gravity Meeting, Institute for Gravitation and the Cosmos, The Pennsylvania State University, University Park, PA.
- Oct 2016 “Diffeomorphism invariant cosmological symmetry in full quantum gravity.” Lecture. MRM26 – 26th Midwest Relativity Meeting, Perimeter Institute for Theoretical Physics, Waterloo, ON, Canada.
- May 2016 “Diffeomorphism invariant cosmological symmetry in full quantum gravity.” Lecture. EGM19 – 19th Eastern Gravity Meeting, Department of Physics, University of New Hampshire, Durham, NH.
- Mar 2016 “Dynamics and Symmetry in Quantum Gravity: Toward a Unified Theory of Pregeometry” (lecture) and “Bohmian holism and pregeometry” (discussion session). Rethinking Foundations of Physics 2016, Basic Research Community for Physics (BRCP), Universität Regensburg Fakultät für Mathematik, & Deutsche Forschungsgemeinschaft (DFG) Graduiertenkolleg (Graduate School) GRK 1692 “Curvature, Cycles, and Cohomology”, Mountain Cabin “Amoseralm”, Dorfgastein, Salzburg, Austria.
- Oct 2015 “The Big Bounce and Multiverses in Quantum Cosmology.” Invited colloquium. Wells College Science Colloquium.
- Mar 2015 “Quantization of a dynamical cosmological sector in loop quantum gravity.” Poster at the FAU Charles E. Schmidt College of Science Research Day.
- Feb 2015 “Quantization of a dynamical cosmological sector in loop quantum gravity.” Lecture. GCGM8 – 8th Gulf Coast Gravity Meeting, Department of Physics, University of Florida, Gainesville, FL.
- Nov 2014 “Instability of an emergent universe [A.T. Mithani & A. Vilenkin, *J. Cosmol. Astropart. Phys.* 05:006 (2014)].” Florida Atlantic University Spacetime Physics (FAUST) Group Seminar.
- Apr 2014 “Consistency of operator orderings in Bianchi I and isotropic LQC.” Poster at the Florida Atlantic University Graduate and Professional Student Association Research Day.
- Apr 2014 “Reconstruction of gauge potentials from Wilson loops [R. Giles, *Phys. Rev. D*24:2160 (1981)].” Florida Atlantic University Spacetime Physics (FAUST) Group Seminar.
- Mar 2014 “Consistency of operator orderings in Bianchi I and isotropic LQC.” Poster at the Florida Atlantic University Charles E. Schmidt College of Science Research Day. *Won Second Place in Physics.*
- Nov 2013 “Spin foam cosmology for beginners.” Florida Atlantic University Spacetime Physics (FAUST) Group Seminar.

- Jul 2013 "Consistency of operator orderings in Bianchi I and isotropic LQC." Lecture. LOOPS '13, Perimeter Institute for Theoretical Physics, Waterloo, ON, Canada. <<http://pirsa.org/13070087/>>.
- May 2013 "'You can't go home again!': Wilson loops, QFT, QCD, LQG, and LQC." Lecture. Department of Physics, Florida Atlantic University.
- Apr 2013 "Consistency of operator orderings in Bianchi I and isotropic loop quantum cosmology." Florida Atlantic University Spacetime Physics (FAUST) Group Seminar.
- Oct 2012 "An introduction to the mathematical structure of loop quantum cosmology." Florida Atlantic University Spacetime Physics (FAUST) Group Seminar.
- Apr 2012 "New Solutions in Loop Quantum Cosmology." Poster at the Florida Atlantic University Graduate Student Association Research Day.
- Apr 2012 "New Solutions in Loop Quantum Cosmology." Poster at the Florida Atlantic University Charles E. Schmidt College of Science Research Day.
- Apr 2012 "On the Question of Cosmic Recall in Quantum Cosmology." Florida Atlantic University Spacetime Physics (FAUST) Group Seminar.
- Feb 2012 "An Introduction to Quantum Cosmology." Invited lecture. Florida Atlantic University Philosophy Club.
- May 2011 "Erasing the multiverse?" University of Massachusetts Dartmouth Three Minute Thesis (3MT) Competition.
- Apr 2011 "An Introduction to Quantum Cosmology." Invited lecture. University of Massachusetts Dartmouth Philosophy Association.
- Apr 2011 "Where are the photons?" Poster at the University of Massachusetts Dartmouth Office of Faculty Development Graduate Poster Session.
- Apr 2011 "Triangulating the Universe: Lorentzian Quantum Gravity in a High-Performance Environment" and "Where are the photons?" Posters at the 17th Annual University of Massachusetts Dartmouth Research Exhibition – University of Massachusetts Dartmouth Chapter of Sigma Xi ($\Sigma\Xi$): The Scientific Research Honor Society.
- Apr 2011 "New Solutions in Loop Quantum Cosmology." Poster at the New England Numerical Analysis Day 2011, Center for Scientific Computing and Visualization Research, University of Massachusetts Dartmouth.
- Mar 2011 "Proceedings of QGG3." University of Massachusetts Dartmouth Physics Journal Club.
- Dec 2010 "Dark Matter in Galaxies - Part II." University of Massachusetts Dartmouth Physics Journal Club.
- Nov 2010 "Progress towards a gauge-invariant wave function for the photon." Poster at the Session for International Research Posters and Creative Work, University of Massachusetts Dartmouth.
- Oct 2010 "Proceedings of the DEISA-TeraGrid Summer School." University of Massachusetts Dartmouth Physics Journal Club.
- Jul 2010 "On the Origin of Gravity and the Laws of Newton [E.P. Verlinde, *J. High Energy Phys.* 1104:029 (2011)]." University of Massachusetts Dartmouth Physics Journal Club.
- Apr 2010 "New Solutions in Loop Quantum Cosmology." Poster at the 16th Annual University of Massachusetts Dartmouth Research Exhibition – University of Massachusetts Dartmouth Chapter of Sigma Xi ($\Sigma\Xi$): The Scientific Research Honor Society.
- Apr 2010 "Why all these prejudices against a constant? [E. Bianchi & C. Rovelli, *arXiv:1002.3966* (2010)]" University of Massachusetts Dartmouth Physics Journal Club.

- Oct 2009 “Gravity and the Quantum [A. Ashtekar, *New J. Phys.* 7:198 (2005)].” University of Massachusetts Dartmouth Physics Journal Club.
- Oct 2006 “Parton Distributions and Neutrino Scattering: Uncertainties of Global QCD Analysis.” Poster Session Presentation – 4th Annual Earlham College Natural Sciences Undergraduate Research Conference. Sponsored by the Howard Hughes Medical Institute (HHMI) and the Earlham College Science Division.
- Sept 2006 “Parton Distributions and Neutrino Scattering: Uncertainties of Global QCD Analysis.” Invited lecture. Earlham College Society of Physics Students (SPS).
- Aug 2006 “Parton Distributions and Neutrino Scattering: Uncertainties of Global QCD Analysis.” Lecture. Department of Physics and Astronomy, Michigan State University, East Lansing, MI.

Selected Other Conferences Attended

- Oct 2022 2022 John M. Burns Conference on the Scholarship of Teaching and Learning, virtual (Teaching, Learning, and Professional Development Center (TLPDC), Texas Tech University).
- Jun 2022 21st Annual Philosophy of Logic, Mathematics, and Physics (LMP) Graduate Conference, virtual (Department of Philosophy, Western University (The University of Western Ontario), London, ON, Canada).
- Jun 2022 Quantum Information and Quantum Gravity Conference (QISS@Western 2022), virtual (Quantum Information Structure of Spacetime (QISS) and Rotman Institute of Philosophy, Western University (The University of Western Ontario), London, ON, Canada).
- May-Jun 2022 Informational Architecture of Spacetime Workshop, virtual (Okinawa Institute of Science and Technology Graduate University (OIST), Onna, Okinawa, Japan).
- Feb 2022 18th Annual Advancing Teaching and Learning Conference, virtual (Teaching, Learning, and Professional Development Center (TLPDC), Texas Tech University).
- Oct 2021 United In Research: Cross-Disciplinary Doctoral Conference, virtual (Institute for Studies in Pragmatism, Texas Tech University).
- Oct 2021 2021 TEVal [Transforming the Evaluation of Teaching] Knowledge Exchange and Summit, virtual (University of Massachusetts Amherst, Amherst, MA).
- Sept-Oct 2021 2021 John M. Burns Conference on the Scholarship of Teaching and Learning, virtual (Teaching, Learning, and Professional Development Center (TLPDC), Texas Tech University).
- Aug 2021 Self-locating Uncertainty in the Cosmological Multiverse Workshop, virtual (Rotman Institute of Philosophy, Western University (The University of Western Ontario), London, ON, Canada and Department of Logic and Philosophy of Science, School of Social Sciences, University of California, Irvine, CA).
- Aug 2021 Emergence in Cosmology Workshop, virtual (Rotman Institute of Philosophy, Western University (The University of Western Ontario), London, ON, Canada and Department of Logic and Philosophy of Science, School of Social Sciences, University of California, Irvine, CA).
- Aug 2021 Conference on Philosophical Aspects of Simulations in Cosmology, virtual (Rotman Institute of Philosophy, Western University (The University of Western Ontario), London, ON, Canada and Department of Logic and Philosophy of Science, School of Social Sciences, University of California, Irvine, CA).
- Aug 2021 Science & Roger Penrose, virtual (The Center for Consciousness Studies, University of Arizona, Tucson, AZ).

- Jun 2021 20th Annual Philosophy of Logic, Mathematics, and Physics (LMP) Graduate Conference, virtual (Department of Philosophy, Western University (The University of Western Ontario), London, ON, Canada).
- Jun 2021 Workshop: Alyssa Ney, "The World in the Wave Function", virtual (Geneva Symmetry Group, Department of Philosophy, Université de Genève, Geneva, Switzerland).
- Jun 2021 Stochastic Thermodynamics II – Junior Women’s Caucus, virtual (Santa Fe Institute, Santa Fe, NM and Department of Bioengineering, Imperial College London, London, England, UK).
- May 2021 56th Cornell Topology Festival, virtual (Department of Mathematics, Cornell University, Ithaca, NY).
- May 2021 Workshop on Stochastic Thermodynamics II (WOST II), virtual (Santa Fe Institute, Santa Fe, NM).
- May 2021 Southern California American Association of Physics Teachers (SCAAPT) Spring 2021 Meeting, virtual (Long Beach City College, Long Beach, CA).
- Apr-May 2021 Public Engagement with Science (and Philosophy of Science) Workshop, virtual (Center for Public Engagement with Science, University of Cincinnati, Cincinnati, OH).
- Mar 2021 17th Annual Advancing Teaching and Learning Conference, virtual (Teaching, Learning, and Professional Development Center (TLPDC), Texas Tech University).
- Nov 2020 2020 Texas Tech University Tenure Academy, virtual (Teaching, Learning, and Professional Development Center (TLPDC), Texas Tech University).
- Nov 2020 Joint Fall 2020 Meeting of the Texas Sections of the American Physical Society (TSAPS), American Association of Physics Teachers (TSAAPT), and Zone 13 of the Society of Physics Students (TSSPS), virtual (University of Texas at Arlington, Arlington, TX).
- Sept 2020 2020 John M. Burns Conference on the Scholarship of Teaching and Learning, virtual (Teaching, Learning, and Professional Development Center (TLPDC), Texas Tech University).
- Nov 2019 American Association of Physics Teachers (AAPT) Fall 2019 New Faculty Workshop (NFW), American Center for Physics & Holiday Inn Washington - College Park, College Park, MD.
- Nov 2019 46th Annual Fall Scientific Paper Session of the Rochester Academy of Science (RAS), Monroe Community College, Brighton (Rochester), NY. *Chaperoned a group of Wells College students.*
- Nov 2019 Mathematical Association of America (MAA) Seaway Section Fall Meeting, Department of Mathematics, Ithaca College, Ithaca, NY. *Chaperoned a group of Wells College students.*
- Jun 2019 LOOPS '19, Institute for Gravitation and the Cosmos, The Pennsylvania State University, University Park, PA.
- May 2019 55th Cornell Topology Festival, Department of Mathematics, Cornell University, Ithaca, NY.
- Apr 2019 Association of American Colleges and Universities (AAC&U)'s 2019 Project Kaleidoscope (PKAL) Upstate New York Regional Network Meeting "Inclusive Excellence in STEM", Rochester Institute of Technology, Henrietta (Rochester), NY.
- Apr 2019 Mathematical Association of America (MAA) Seaway Section Spring Meeting, Department of Mathematics, St. John Fisher College, Pittsford (Rochester), NY. *Chaperoned a group of Wells College students.*
- Jun 2018 18th Annual Philosophy of Logic, Mathematics, and Physics (LMP) Graduate Conference, Department of Philosophy, Western University (The University of Western Ontario), London, ON, Canada.

- Jun 2018 Thermodynamics as a Resource Theory: Foundational and Philosophical Implications, Rotman Institute of Philosophy, Western University (The University of Western Ontario), London, ON, Canada.
- May 2018 EGM21 – 21st Eastern Gravity Meeting, Long Island University Brooklyn, Brooklyn, NY.
- May 2018 54th Cornell Topology Festival, Department of Mathematics, Cornell University, Ithaca, NY.
- Apr 2018 Topology and Correlation in Quantum Materials: The 118th Topical Symposium of The New York State Section of The American Physical Society (NYSAPS), State University of New York at Binghamton, Binghamton, NY. *Chaperoned a group of Wells College students.*
- Feb 2018 Association of American Colleges and Universities (AAC&U)'s 2018 Project Kaleidoscope (PKAL) Upstate New York Regional Network Meeting "Strategies for Helping Students Succeed: Group Share Among STEM Instructors for Majors and Non-Majors Courses", State University of New York College at Oneonta, Oneonta, NY.
- Jun 2017 17th Annual Philosophy of Logic, Mathematics, and Physics (LMP) Graduate Conference, Department of Philosophy, Western University (The University of Western Ontario), London, ON, Canada.
- Jun 2017 Cosmology and the Future of Spacetime, Rotman Institute of Philosophy, Western University (The University of Western Ontario), London, ON, Canada.
- May 2017 53rd Cornell Topology Festival, Department of Mathematics, Cornell University, Ithaca, NY.
- Apr 2017 42nd Annual New York State Regional Graduate Mathematics Conference (ANYSRGMC), Department of Mathematics, Syracuse University, Syracuse, NY.
- Apr 2017 Mathematical Association of America (MAA) Seaway Section Spring Meeting, Department of Mathematics, State University of New York at Oswego, Oswego, NY.
- May 2015 Workshop on distributions, weak derivatives, and Sobolev spaces, Department of Mathematical Sciences, Florida Atlantic University, Boca Raton, FL.
- Mar 2015 Beyond Spacetime II: Seminar on the Philosophical Foundations of Quantum Gravity – Time in Quantum Gravity, University of California, San Diego, CA.
- Sept 2013 Beyond Spacetime: Seminar on the Philosophical Foundations of Quantum Gravity, University of Illinois at Chicago, Chicago, IL.
- Jun 2011 EGM14 – 14th Eastern Gravity Meeting, Princeton Center for Theoretical Science, Department of Physics, Princeton University, Princeton, NJ.
- Apr 2011 Spring 2011 Joint Meeting of the New England Sections of the American Physical Society (APS) & American Association of Physics Teachers (AAPT), University of Massachusetts Lowell, Lowell, MA.
- Apr 2011 Society of Physics Students (SPS) Spring 2011 Zone 1 Meeting, University of Massachusetts Dartmouth, Dartmouth, MA. *Co-organized and presented as UMD SPS Vice-President with Boston University, Trinity College (Connecticut), and the University of Massachusetts Lowell.*
- Nov 2010 Deviant Logic Symposium, University of Massachusetts Dartmouth, Dartmouth, MA.
- Oct 2010 Einstein Fellows Symposium 2010, Center for Astrophysics | Harvard & Smithsonian (CfA), Cambridge, MA.
- May 2010 EGM13 – 13th Eastern Gravity Meeting, Department of Physics, North Carolina State University, Raleigh, NC.
- Apr 2010 Society of Physics Students (SPS) Spring 2010 Zone 1 Meeting, Northeastern University, Boston, MA.

- Nov 2009 University of Massachusetts Dartmouth Department of Physics Symposium: Computing and Simulation in Astronomy and Physics, Dartmouth, MA.
- Jun 2009 Abhayfest 2009 – a conference in honor of Dr. Abhay Ashtekar’s 60th birthday, Institute for Gravitation and the Cosmos, The Pennsylvania State University, University Park, PA.
- Apr 2007 First Annual Great Lakes Colleges Association (GLCA) Undergraduate Philosophy Conference, Earlham College, Richmond, IN.
- Oct 2006 7th Annual Indiana Local Section American Chemical Society (ACS) Poster Session, Earlham College, Richmond, IN.
- Mar 2006 Indiana Section of the Mathematical Association of America (INMAA) Spring Meeting, Taylor University, Upland, IN.
- May 2001 2001: A Spacetime Odyssey – Inaugural Conference of the Michigan Center for Theoretical Physics (MCTP) , University of Michigan, Ann Arbor, MI.

Selected Outreach & Service

- May 2022 **Co-Organizer and Invited Speaker**, “*Movimiento y Ciencia Ficción (Movement and Science Fiction)*” interactive workshop and exhibition on chaos theory, “*DNArt*” art + science event. YPO [Young Presidents’ Organization] Costa Rica, Texas Tech University – Costa Rica.
- Nov 2020 **Invited Speaker**, “*My Academic Journey.*” Texas Tech University Women in Physics (WiP).
- Aug 2019 **Invited Speaker**, “*Panel Discussion – Get to Know your Science Profs!*” Wells College Science Colloquium.
- Aug 2018 **Invited Speaker**, “*Panel Discussion – Get to Know Your Science Profs!*” Wells College Science Colloquium.
- Sept 2017 **Invited Speaker**, “*Panel Discussion – Get to Know Your Professors.*” Wells College Science Colloquium.
- Sept 2016 **Invited Speaker**, “*Panel Discussion – Get to Know Your Professors.*” Wells College Science Colloquium.
- Apr 2015 **Invited Speaker**, “*Hooke’s Law: Theory and Applications.*” North Carolina School of Science and Mathematics, Durham, NC.
- Apr 2015 **Invited Speaker**, “*The Big Bounce and Multiverses in Quantum Cosmology*”, Nerd Nite Miami, Gramps, Miami, FL.
- Jan 2015 **Invited Speaker**, “*The Science Behind Science Fiction*” and “*Influences of Science Fiction*”, Miami International Science Fiction Film Festival, Hyatt Regency Miami, Miami, FL.
- Dec 2014 **Invited Speaker**, “*The Science Behind Science Fiction*”, Centers for Ocean Sciences Education Excellence (COSEE) Florida, Nerd Nite Miami, and the Miami International Science Fiction Film Festival, Open Stage Club, Coral Gables, FL.
- Jul 2008 **Consultant**, *Sky Spirals @ Sun Farm & Space Ink*, Claverack, NY.
Consultant on the design and cosmology of an integrated observatory.

Department Service

- 2022–present **Invited Speaker**, Texas Tech University – Costa Rica Physics & Astronomy Department Monthly Open House.
- Nov 2020 **Judge**, 4th Annual Texas Tech University Department of Physics and Astronomy Poster Competition.

- Fall 2019 **Senior Thesis Co-Advisor**, Ar Corsino, Jr., Gavin M. Davis, Caden W. O'Loughlin, Jordan E. Stoops, Jalen C. Tribble, and Joshua A. Undari (Wells College, Class of 2020).
- 2019–2020 **Mathematics Major Advisor**, Gwendolyn M. Catalano (Wells College, Class of 2021), Jalen Feliz (Wells College, Class of 2023), Haddijatou Foon (Wells College, Class of 2023), Mathew J. LaFrance (Wells College, Class of 2022), Erin M. Morrissey (Wells College, Class of 2021), Joshua A. Undari (Wells College, Class of 2020).
- Spring 2019 **Senior Thesis Co-Advisor**, Aala Al-Hashimi (Wells College, Class of 2019), "Fractals".
- Spring 2018 **Senior Thesis Co-Advisor**, Frank A. Brooks IV, Quinn P. Doubet (→ University of Rochester Medical Center), Eric J. Hartmann, and Tanner M. Mingen (→ Tennessee Technological University) (Wells College, Class of 2018).
- 2017–2020 **Liaison**, Mathematical Association of America to Wells College.
- 2016–2020 **Faculty Advisor**, Wells College Physics Club.
- 2016–2017 **Mathematics Minor Advisor**, Amelia C. Flint (Wells College, Class of 2017).
- 2015–2016 **Senior Thesis Co-Advisor**, Jennifer A. Richardson (Wells College, Class of 2016), "Dark Energy: Searching for a Way to Harness This Power and How Science Fiction Could Get Us There".
- 2014–2015 **Organizer**, FAU International Loop Quantum Gravity Seminar.
- 2011–2014 **Volunteer**, FAU Physics Department Pumpkin Drop Day.
- Feb 2012 **Judge**, Florida Science Olympiad.
- 2010–2011 **Vice President**, University of Massachusetts Dartmouth Society of Physics Students.
- Oct 2007 **Volunteer**, Ohio University Physics & Astronomy Department Open House.
- 2006–2007 **Inaugural President**, Earlham College Society of Physics Students.
- University Service**
- 2022–present **Convener**, Texas Tech University – Costa Rica ad hoc Sustainability Committee.
- 2022–present **Member**, Texas Tech University – Costa Rica Student Life & Leadership Committee.
- 2019–2020 **Faculty Advisor**, Wells College Pride!.
- 2017–2018 **Secretary of the Faculty and, ex officio, Chair**, Wells College Committee on Committees.
- 2017–2020 **Faculty Representative**, Wells College President's Advisory Committee on Diversity, Equity, and Inclusion (PACDEI).
- 2016–2020 **Member**, Wells College Sustainability Advisory Committee.
- 2015–2020 **Member**, Wells College Department of Women's, Transgender, and Queer Studies.
- 2015–2020 **Co-Founder (2015+) & Inaugural Chair (2018-2020)**, Wells College Contingent Faculty Union (SEIU Local 200United).
- 2015–2020 **President (2017-2018), Treasurer (2016-2017), Social Co-Chair (2015-2016, 2019-2020)**, Wells College Faculty Club.
- 2013+ **Co-Founder**, FAU Dream Defenders.
- 2012–2015 **Founding Member, Historian, Physics Department Representative**, FAU College of Science Graduate Association.
- 2012–2015 **Vice President (2013-2014), Treasurer (2012-2013 & 2014-2015)**, FAU Feminist Graduate Student Association (formerly Women's Studies Graduate Student Association).
- 2013–2015 **Treasurer**, The F-Word! FAU Feminists.
- 2012–2013 **Treasurer**, FAU Lambda United.

2004–2007 **Co-Convener**, *Earlham College Action Against Sexual Violence (formerly Action Against Rape)*.
[Conference Organization](#)

May 2023 **Co-organizer**, *Celebration of Women in Mathematics, Mathematical Sciences Research Institute (MSRI), Berkeley, CA.*

Feb 2023 **Co-organizer**, *philosophia naturalis: Making Sense of Relations and Realities (with E. Bisanz), 2023 American Philosophical Association Central Division Meeting, Hilton Denver City Center, Denver, CO.*

May 2022 **Co-organizer**, *Celebration of Women in Mathematics, Mathematical Sciences Research Institute (MSRI), Berkeley, CA.*

May 2018 **Judge and Presenter, American Physical Society Topical Group in Gravitation's Blue Apple Award for Best Student Talk, EGM21 – 21st Eastern Gravity Meeting, Long Island University Brooklyn, Brooklyn, NY.**

Apr 2011 **Co-organizer**, *Society of Physics Students Spring 2011 Zone 1 Meeting. University of Massachusetts Dartmouth. Co-organized with Boston University, Trinity College (Connecticut), and the University of Massachusetts Lowell, Dartmouth, MA.*

[Refereeing](#)

Peer reviewer, *Classical and Quantum Gravity.*

[Selected Grants, Awards, & Funding](#)

2019–2020 Project Co-Lead, Wells College – Interfaith Youth Core (IFYC) Innovation Grant: “We Are Wells”: \$2,000.

2013 NASA – Florida Space Grant Consortium (FSGC) Space Grant, via PI Jonathan Engle: \$12,525 (of \$25,000 total) for the project “Loop Quantum Gravity Dynamics from the CMB Missions”.

2011 Florida Atlantic University Provost Fellowship: \$2,500.

2010 Foundational Questions Institute (FQXi) Mini-Grant, via PI Gaurav Khanna: \$3,750 for my project, “Applying HPC Techniques to CDT Simulations”.

2010 NASA – Massachusetts Space Grant Consortium (MASGC) Space Grant: \$1,800 for my project, “Novel solutions in Loop Quantum Cosmology”.

2010 University of Massachusetts Dartmouth Physics Department Service Award: \$50.

2009 University of Massachusetts Dartmouth University Scholarship: \$3,600.

2007 Earlham College Russell M. Lawall Physics Research Award in Memory of Howard S. Brinton: \$375. *This award is given to a physics major conducting original study or research.*

2006 National Science Foundation (NSF) Research Experiences for Undergraduates (REU) at Michigan State University: \$3,000, plus room and board.

2006 The National Science & Mathematics Access to Retain Talent (SMART) Grant: \$4,000.

2005 Earlham College Verne F. Swaim Memorial Scholarship Award for Physics Excellence: \$300. *This award is presented to an undergraduate who shows strong competence in physics, achievement of individual potential, and dedication to the field of physics as a career choice.*

2003 Earlham College Plowshares Media Arts Grant: \$950.

2003 Earlham College Howard Hughes Medical Institute (HHMI) Fellowship.

2003 Earlham College Presidential Honors Scholarship: \$28,000.

2003 Earlham College Elma & Orville Wilkinson Scholarship: \$12,000.

Travel Funding

- 2023 Texas Tech University Institute for Studies in Pragmatism Faculty International Travel Award, to attend the 2023 American Philosophical Association Central Division Meeting: \$2,140.
- 2019 Institut de Recherche Mathématique Avancée (IRMA, Université de Strasbourg) International Travel Award, to attend L'Agape 2019: €150.
- 2019 Basic Research Community for Physics (BRCP) International Travel Award, to attend L'Agape 2019: €300.
- 2019 Wells College Faculty Travel Award, to attend the Association of American Colleges and Universities (AAC&U)'s 2019 Project Kaleidoscope (PKAL) Upstate New York Regional Network Meeting "Inclusive Excellence in STEM": \$169.26.
- 2019 Wells College Faculty International Travel Award, to attend the Seventh Split Summer School in the Philosophy of Physics ($\Phi \wedge \Phi$): \$600.
- 2018 Wells College Faculty International Travel Award, to attend Thermodynamics as a Resource Theory: Foundational and Philosophical Implications, and the 18th Annual Philosophy of Logic, Mathematics, and Physics (LMP) Graduate Conference: \$686.20.
- 2018 Wells College Faculty Travel Award, to attend EGM21 – 21st Eastern Gravity Meeting: \$397.96.
- 2018 Wells College Faculty Travel Award, to attend Topology and Correlation in Quantum Materials: The 118th Topical Symposium of The New York State Section of The American Physical Society (NYSAPS): \$283.80.
- 2018 Wells College Faculty Travel Award, to attend the Association of American Colleges and Universities (AAC&U)'s 2018 Project Kaleidoscope (PKAL) Upstate New York Regional Network Meeting "Strategies for Helping Students Succeed: Group Share Among STEM Instructors for Majors and Non-Majors Courses": \$65 + accommodation.
- 2017 Wells College & The Endeavor Foundation Faculty International Travel Award, to attend EGM20 – 20th Eastern Gravity Meeting, Cosmology and the Future of Spacetime, and the 17th Annual Philosophy of Logic, Mathematics, and Physics (LMP) Graduate Conference: \$1,025.23.
- 2017 Wells College Faculty Travel Award, to attend the Mathematical Association of America Seaway Section Spring Meeting and the 42nd Annual New York Regional Graduate Mathematics Conference: \$146.40.
- 2017 Wells College Faculty International Travel Award, to attend MRM26 – 26th Midwest Relativity Meeting: \$636.74.
- 2016 Wells College Faculty Travel Award, to attend EGM19 – 19th Eastern Gravity Meeting: \$800.
- 2016 Wells College Faculty International Travel Award, to attend Rethinking Foundations of Physics 2016: \$1,168.75.
- 2016 Universität Regensburg International Travel Award, to attend Rethinking Foundations of Physics 2016: €1,416.
- 2015 University of California, San Diego Travel Award, to attend Beyond Spacetime II: Seminar on the Philosophical Foundations of Quantum Gravity – Time in Quantum Gravity: \$340.
- 2014 Friedrich-Alexander-Universität Erlangen-Nürnberg International Travel Award, to attend the Third Erlangen Fall School on Quantum Geometry: €1,030.
- 2013 Friedrich-Alexander-Universität Erlangen-Nürnberg International Travel Award, to attend the Second Erlangen Fall School on Quantum Geometry: €940.
- 2013 Florida Atlantic University Student Government International Travel Award, to attend the LOOPS 13 conference: \$780.

- 2011 National Science Foundation (NSF) International Travel Award, to attend the Third Quantum Geometry and Quantum Gravity School: \$900.
- 2010 National Science Foundation (NSF) International Travel Award, to attend the European-US Summer School on High Performance Computing Challenges in Computational Sciences: \$2,400.
- 2007 Earlham College Alphaeus and Erastus Test Scholarship for International Study (Australia): \$3,000.