

JENNIFER “JENNY” LORRAINE NIELSEN

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“The most beautiful thing we can experience is the mysterious.” - Albert Einstein

EDUCATION

- PhD Philosophy of Science/Physics** August 2018- 2027+
 University of Kansas
 Dissertation Topic: New Mechanism, Particle Physics
 PhD Candidacy Achieved.
 Dissertation: *Math Over Mechanism* in preparation.
 Dissertation: *The Complex Hopf Fibration as the Canonical Space for Gauge-Gravity Unification*. In preparation.
- MSc Physics**, University of Kansas
 Quantum Physics / Particle Physics / Quantum Computation
 Mentors: John Ralston, Siyuan Han, Michael Murray.
 MS Defense Paper: “Is Bit It?”
- MA Philosophy of Science**
 Committee: Eileen Nutting, Armin Schulz, Michael B. Murray
 MA Defense Paper: “The Scope of New Mechanism”
- BSc Physics Math/Statistics**, University of Missouri – Kansas City
 Summa Cum Laude and Highest Departmental Honors

RESEARCH EXPERIENCE

- Director of Research. Center for Topological Physics.** 2025
Project in Progress, CTP, Kansas Institute of Science 2019-
Project A: A Topological Unified Field Theory / “Theory of Everything”.
Project B: Mathematical Proofs for Submission to Peer Review
Dissertation in Progress, University of Kansas 2022-Present

“Math over Mechanism: On the Limits of New Mechanism and the Supremacy of Mathematical Explanation in the Natural Sciences”

Theoretical Physics Project. High Energy Particle Physics. 2021-Present

Supervisor: Dr. Michael Murray, KU Particle Physics.

Simulations, modeling, theoretical particle physics project.

Graduate Research Assistant, Institute for Information Science (“I2S”) 2023

Focus: Scientific explanation, technology, cutting edge science, cybersecurity.

Research Assistant, Integrated Arts Research Initiative 2021-2022

- CERN Collaboration / “Collective Entanglements”/ Intern in Quantum Physics
- Inquiry Collaborator / Team Intern / Assistant to Curator of Research
- Paper: “Science as Performance” Spencer Museum of Art.

Research Assistant, FOCI (Foundations of Cognition Initiative). 2020-2021

- Data collection and organization
- Research assistantship
- Grant research & applications

University of Kansas Quantum Computing Lab, Lawrence KS 2013-17

Research Assistant for Dr. Siyuan Han in consultation with Dr. John Ralston.

- Josephson Junctions, Phase Qubit Operation, Superconductors, LG Inequalities, Measures of Entanglement.
- Quantum Computing Group.

UMKC Galaxy Evolution Group, Kansas City 2009-11

Research Assistant for Dr. Daniel McIntosh.

- Observational Astronomy at Kitt Peak, Arizona Observatory
- Conference Paper / Award, Metallicity in Galaxies
- Contributed to Merging Galaxy Catalog

University of Arkansas Quantum Optics Lab, Fayetteville, AR. 2008

REU Fellowship / Internship with Dr. Reeta Vyas.

- Modeling of Hermite, Laguerre-Gaussian, and exotic (parabolic) modes of laser beams

Independent Study, General and Special Relativity 2007-2015

TEACHING

Adventure School of Kansas (ASK). 2015-Present

Teacher / Tutor / Summer School Instructor

ESL for Chinese Students, Math, Chemistry, AP Physics, AP statistics, Logic & Ethics, Philosophy, Writing, Accessibility Coordinator.

Developed hands on methods of teaching quantum physics and statistical principles

Adjunct Instructor of Physics & Lab, Neosho County Community College 2023

Adjunct Instructor of Philosophy / Ethics. Neosho County Community College 2023

Ethics Instructor, University of Kansas	2022-2023
Graduate Teaching Assistant, Philosophy.	2022
• Taught four discussion courses in Sophomore Ethics. • Professor of Record: <i>Ethics of Sports</i>.	
Haskell Indian Nations University, Lawrence, KS	2016-2020
Adjunct Professor, Mathematics	2016
Adjunct Professor, Science	2016
Head Math Tutoring Instructor	2020
Volunteer Tutor (Tekakwitha House)	2024
Academic Support Aide, KU Accessibility, Mathematics Department.	2020
Math Tutor for Jayhawks. Student Athlete Support Services KU. Tutored Calculus, Statistics, Analysis, English for athletes.	2015
Math & Physics Instructor.	(Seasonal)
University of Kansas Medical School, Health Science Enrichment Institute. Statistics & Calculus Based Physics. Summer School sponsored by the Office of Diversity and Inclusion, KU Med.	
• Taught and developed curriculum, exams and quizzes for accelerated summer classes for diverse and underrepresented incoming freshman & sophomore pre-med students. • Months: May-August 2012; May-August 2013, May-August 2014	
Physics Laboratory Instructor / Teaching Assistant.	
KU Physics Department.	2012-2017
Taught and graded introductory physics labs for college and engineering physics. 2-3 classes per semester.	
Undergraduate Laboratory Teaching Assistant, UMKC, Physics.	2006-2010
Assisted and substituted for graduate TA's in UMKC's physics department. Tutored undergraduates. Substitute Taught one semester of Physics Lab solo	

PUBLICATIONS

2025. JL Nielsen. "*The Complex Hopf Fibration as the Canonical Space for Gauge-Gravity Unification.*" AKA "*The Topological United Field Theory on the Complex Hopf Fibration.*" Forthcoming. *International Journal of Topology* (sister journal of *Mathematics*).

<https://philpapers.org/rec/NIETTU>

2026. "Einstein's Teleparallel Gravity as a First Order Approximation of TUFT."

2026. JL Nielsen. "Some Proofs about Fiber Bundles and Gauge Theory."

2026. JL Nielsen. "Why Spacetime Torsion is Not Sourced by Traditional Spin Density."

2025. JL Nielsen and Lu Semita. "A Proposed Proof of the Riemann Hypothesis."

2025. JL Nielsen and Lu Semita. "The Navier Stokes Problem."

2026. JL Nielsen and Lu Semita. "The Yang Mills Mass Gap."

2025. JL Nielsen. "The Double Hopf Method in Complex Time: A Complete Solution to The Problem of Turbulence." <https://philpapers.org/archive/NIEACS.pdf>

2026. JL Nielsen. The Secret Life of Peter Abelard.

2023. JL Nielsen. "Mapping Relativistic Space to Quantum Space Via The Hopf Fibration (i.e., Quantum Gravity). Preprint (Limited Distribution).

<https://docs.google.com/document/d/1uD5MBZQNe-zH6a0m4AFJ4rGazNOWsWis>

2019. JL Nielsen. Hopf Field Unification Plan.

2019. JL Nielsen. Quanglebit and Hopf Fiber Fields.

https://www.vixra.org/author/jennifer_lorraine_nielsen

2025. JL Nielsen. "Quantum Gravity as a Vibrating Bundle of Worldlines: Topological Unified Field Theory for Beginners." Medium.

<https://medium.com/@jennylorrainenielsen/quantum-gravity-as-a-vibrating-bundle-16feb06a7248>

2025. JL Nielsen and Deepak Chopra. Beyond Separation Physics Meets Nonduality on the Topological Unified Field Theory.

<https://deepakchopra.medium.com/beyond-separation-physics-meets-nonduality-in-the-topological-unified-field-theory-92c4fed7f3e7>

2024. JL Nielsen. "Math Over Mechanism: Introducing New Relational Structuralism."

<https://philpapers.org/rec/NIEDAF>

2023. JL Nielsen. "The Scope of New Mechanism." Forthcoming.

<https://philpapers.org/rec/NIETSO-11>

2023. JL Nielsen, Caelan Lovell, Abishai Mathai, Brendan McRoberts, James Bowen, Michael Murray. "Bremsstrahlung from the Most Rapid Deceleration Ever Seen." Forthcoming.

2022. *Life, Liberty, and the Pursuit of Access*. Brousseau Exhibit, Spencer Museum of Art.

Co-Author. <https://spencerart.ku.edu/art/collections-online/exhibition/3429>

2018. Nielsen, Jennifer and Deepak Chopra. *How to See the Whole Universe: Nonlocality & Acausality*. Part 1 of 2-part series.

<https://www.sfgate.com/opinion/chopra/article/How-to-See-the-Whole-Universe-Nonlocality-and-6924905.php>

2018. Nielsen, Jennifer and Deepak Chopra. *Why the Physical Universe Needs Mental Glue*. San Francisco Chronicle. Part 2 of 2-part series.

<https://www.sfgate.com/opinion/chopra/article/Why-the-Physical-Universe-Needs-Mental-Glue-7465399.php>

2017. ME Weston, DH McIntosh, Jennifer Nielsen, et al. "Incidence of WISE-Selected Obscured AGNs in Major Mergers and Interactions from the SDSS". Monthly Notices of the Royal Society, (2017) 464:4 <https://watermark.silverchair.com/stw2620.pdf>

2014/15. Comment Predicting / Formulating Pseudo-Strong AI via Statistical LLMs. FQXI.

2012. Nielsen, Jennifer L. The Heart is a Dustboard: Abu'l Wafa Al Buzjani, Dissection, Construction and the Dialogue between Art and Mathematics in Medieval Islam. Convergence Journal. Sosland Journal. First Prize HOMSIGMAA paper award (History of Mathematics Special Interest Group of the Mathematical Association of America).

2011. Jennifer Nielsen, DH McIntosh, et al. Age and Metallicity of Merging Galaxies and Merger Remnants in the SDSS. Bulletins of the AAS, Meeting #217. (Winner of Chambliss Award for Research in Astronomy)

2011. Nielsen, Jennifer L, et al. Spectroscopic Confirmation of the Ongoing Assembly of Giant Ellipticals. <https://ui.adsabs.harvard.edu/abs/2011noao.prop..117M/abstract>

2011. Co-author with Andrew Cooper, DH McIntosh, et al. The Role of Active Galactic Nuclei in the Major Merging Process. AAS Poster meeting #217

2011. Co-author with AM Koekemoer, et al. CANDELS: The Cosmic Assembly Near-Infrared Deep ExtraGalactic Legacy Survey: The Hubble Space Telescope Observations, Imaging Data Products, and Mosaics. The Astrophysical Journal Supplement Series. 197 (2)

2011. Semester Short Term Project. Dr. Chiu Lab, KU. "Original Method of Transfer of Single Layer Graphene Using Cellulose Tape For Application to Fiber Optic Cable Tips."

Nielsen, JL, et al. Spectroscopic Confirmation of Ongoing Assembly of Giant Ellipticals. NOAO proposal 2011

CANDELS: The Cosmic Assembly Near-infrared Deep Extragalactic Legacy Survey - The Hubble Space Telescope Observations, Imaging Data Products and Mosaics. Co-Author. <https://iopscience.iop.org/article/10.1088/0067-0049/197/2/36/meta>

PROFESSIONAL SERVICE & OUTREACH

"The Physics of Everything" - Matt Cheltenham and UK Philosophers. Guest.	2025
Space Madness Podcast.	2026
IO Experience Podcast ("Quantum Photonics Club")	2026.
"The Topological Unified Field Theory." Talk, APEC.	2025-2026.
"On Topological Unification." Keynote Talk, University of Guadajuato.	2025.

“The Topological Unified Field Theory.” Talk, MIUniversity. April 2025.

“Topological Torsion Drives.” APEC. 2025.

“Science by Number” – Radio/podcast host for Mercury Broadcasting, California. 2016-2017

**Guest Speaker, Keynote, and Talk, “Nonlocal Universe.” 2017
SAND Conference.**

Guest Speaker, Documentary Program “Nonlocal Universe”. 2015
Featured on “Curious Minds: Thought Leaders and Nobel Prize Winners”.

Organizer / Sponsor / Teacher. Quantum Camp for Kids. Lawrence Public Library. 2016
Introduced pre-school and grade school age children to concepts from quantum physics.

Conference Co-Organizer. University of Kansas. April 2019
Helped organize an undergraduate conference in philosophy.

Outreach Coordinator, Society of Physics Students, UMKC Chapter. 2006-2010
Organized guest speakers, public outreach, tours / travel, events.

Volunteer Educator/SPS Coordinator “Webelos on Wheels” event. UMKC. 2006-2010

Volunteer Science Demo Presenter for touring high school students. 2008-2011
Worked with Debbie Dilks, Engineering Department.

Judged & Peer-Reviewed Articles for:
2019 Undergraduate Conference in Philosophy Essay Awards
2010 Undergraduate Physics Papers Awards.
2006 High School STEM Competition.

High School Science Journalist. KCXL. Local. “Wonderland”, Local Friday Morning Radio Show, Kansas City.

PROFESSIONAL EXPERIENCE

Staff Scientist / Professional Science Writer. Supervisor: Dr. Sabine Hossenfelder	2023-2024
Engineering Physicist / Advanced Propulsion Dynamicist. Private Foundation.	2022- Present
Tutor.com Online Tutor Tutored Math, Physics, Chemistry. January-September 2010	2010-2011
Social Media Manager. Phoenix Woodworking.	2018-2019
Social Media Manager (NDA. Sports Company)	2015-2016
Assistant, Keith M. Ashman	2011-2014
Paralegal William (“Bill”) O’Sullivan and Todd A. Nielsen Law Firms	2003-09

PRESENTATIONS & INVITED LECTURES

Testing the Topological Unified Field Theory Invited Talk, APEC Advanced Propulsion Engineering Conference.	June 14, 2025
Unfolding the Universe with the Topological Transcausal Unified Field Theory. APEC Advanced Propulsion Engineering Conference. Invited Talk.	April 12, 2025
The Topological Unified Field Theory. Invited Talk, MIU.	May 2025
PhD Candidacy Prospectus Defense. “The Limits of Mechanism.”	November 2022
Qualifying Defense. “The Scope of New Mechanism”. October 2021.	
“Science as Performance and Applied Philosophy & Physics at the Spencer.” (Invited Speaker.) IARI Graduate Panel in Philosophy of Science. Invited talk. April 21, 2022 at the Commons at KU. Sponsored by the Spencer Museum of Art, the Integrated Arts Research Initiative, The Commons, the Department of Physics at KU, the Department of Mathematics at KU, and the Department of Philosophy at KU.	
University of Kansas, Philosophy of Science Talks • “Science as Performance” – Keynote Talk for Graduate Panel in Philosophy of Science, Collective Entanglements, Hall Center, KU	
Master’s Defense, Physics. Quantum Information. (“Is Bit It?”). June 2017.	

“Nonlocal Universe.” Individual Presentation and Keynote Talk Participant. SAND Conference, October 2017. <https://youtu.be/wK3-dxPJmv0>

“Nonlocal Universe”. Curious Minds Invited Speaker / “Thought Leader.”
Interviewed by Deepak Chopra. <https://www.youtube.com/watch?v=q4dGfW41GDM>

University of Kansas, Physics Department, Seminar Talks:

- “Entanglement, Entropy of Information, and Exploiting Quantum Chaos.” (April 2017)
- “Unreality and Acausality: The Leggett-Garg Inequalities.” (December 2015)
- “Exploiting Coherence and Entanglement.” (March 2015).
- “Approaches to Tripartite Entanglement.” (October 2014)
- “Traversable Wormholes.” (May 2013)
- “Watched Pots at the Quantum Level - The Quantum Zeno Effect.” (2013)
- “Beyond Bell.” (October 2013).

January Meeting, Seattle, AAS. Poster Presentation / Talk. “Age and Metallicity of Galaxies.”
Chambliss Award Winning Presentation. 2011.

April MARAC Meeting, Kansas City, MO. Feature Talk. “Do Paired Galaxies Age Better?
Mergers vs Lonely Singles.” 2011.

DAMOP Conference. Charlottesville, VA. (Participation, informal talk) May 2009
Presented undergraduate work in Quantum Optics with Nicolas Gisin and other quantum optics
physicists on invitation of Nicolas Gisin.

“Exotic Beam Modeling.” University of Arkansas. July 2008

GRANTS, HONORS & AWARDS

I2S (“KU Telecom”) Grant for GRA. 2022

IARI (Integrated Arts Research Initiative) Andrew Mellon Fellowship. 2021-2022

KU Doctoral Grant. 2018-2022

FQXI (Foundational Questions Institute) Award / Grant 2013
\$1000 monetary cash prize for winning essay in philosophy of science
for “Is Bit It?”

KU Entry Fellowship in Physics 2012
Tuition and expenses for work in physics

Summa Cum Laude, Physics BS w/ Mathematics & Statistics 2010
with Highest Departmental Honors in Physics

Chambliss Award for Undergraduate Astronomical Research 2011
For research presented in 2011 AAS conference.

AMA – HOM-SIGMAA Prize in Mathematics	2011
Advanced Prize Ilus W. Davis Essay Competition	2011
SEARCH Scientific Research Prize	2007
Patricia Schatzkin Award - Most Outstanding Woman's Fellowship - UMKC	2006
Women's Club Going for Excellence Award	2006
Faculty Choice Award / Curator's Scholarship	2007
1st Place Ilus W. Davis Essay Competition	2004
Award for Outstanding Achievement in Spanish (UMKC Spanish Program)	2004

Other Scholarships

Don and Lucille Armacost Scholarship	2009
KF Cheng Scholarship, UMKC	2009
James M. Phillips Undergraduate Award in Physics	2008
REU Fellowship, University of Arkansas	2008
KL Cheng Undergraduate Award in Physics	2007

PROFESSIONAL TRAINING

Algorithmic Information Dynamics. Complexity Institute, Online.	2018
GTA Training. University of Kansas.	2022

LEADERSHIP & PROFESSIONAL AFFILIATIONS

Director of Research, Center for Topological Physics.	2025-
APA Propulsions Consultant.	2023+
Internet Science Education Project. Consultant.	2015+

Fundamental Fyziks Group (2nd Generation)	Since High School
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Ongoing conversations with Jack Sarfatti, Nick Herbert, Hal Puthoff.

APEC (Alternate Propulsion Engineering Conference) Contributor. 2025+

Private Work. (Various NDA's). 2016+

GASP – Graduate Association of Philosophy Students at KU (Member) 2018-

Student Senator, University of Kansas 2021-2022

President, Society of Physics Students, UMKC Chapter. 2008-2010

Developed outreach programs in astronomy at UMKC Observatory (“Night with the Stars”). Coordinated trips to Argonne National Labs, Fermi Lab, and UChicago. Obtained funding yearly via UMKC student government.

Secretary, Society of Physics Students, UMKC Chapter. 2006-2008

Communication manager, outreach organizer, website developer. Obtained funding from student government.

Golden Key International Honors Society 2010

COMMUNITY VOLUNTEERING

Justice Matters. (Direct Action & Research Training Center.) 2021-

Lawrence, KS. Team Leader / Team Network Member.

(Advocacy and research towards community mental health, homelessness resources, restorative practices, youth & elder care reform)

St John Parish: Visit shut-in/elderly parishioners for company/conversation/support 2021-2023

Social Service League of Kansas. Volunteer. 2012-2013

Assistant Care-Taker, Bengal Tiger Cubs, Cedar Cove Wildlife Center. 2006

TECHNICAL SKILLS & LANGUAGES

Technical Skills:

- **Programming:** Python, C++, MATLAB, Mathematica/SageMath, Mathcad, FORTRAN, LaTeX/Overleaf, SymPy, SPSS, RStudio, HTML/CSS, etc
- **AI: Grok/ChatGPT/Claude/Perplexity/DeepSeek; Neural Networking**
- **Advanced Mathematics:** Topology, Differential & Spectral geometry, tensor calculus, Fiber Bundles, Homotopy, Chern-Simons, Random Numbers/Chaos & Catastrophe Theory, Complexity, Advanced/Fuzzy Logic
- **Applications:** Quiskit/Cirq, IRAF, MS Office, Excel, Adobe Acrobat, Google Suite, SQL
- **Audio / Video:** Recording, Editing (Audacity, Adobe, Vegas, etc)
- **Operating Systems:** Mac, Windows, Linux, Android & IOS

Languages:

- **English:** Native Language
- **Latin & Medieval Latin:** Intermediate
- **Spanish:** Intermediate (Reading), Conversational (Speaking)
- **German, Chinese, French, Italian, German, Hindi, Lakota:** Novice
 - *(Quick study with languages given minimal exposure)*

REFERENCES*

Research:

- Dr. Michael Murray, KU Professor of Physics. Research Supervisor. MJMurray@ku.edu
- James Bowen, Professor of Physics at Baker, Researcher KU, Colleague: j294b619@ku.edu
- Dr. Jack Sarfatti, Long-time Mentor. jacksarfatti@gmail.com
- Dr. Keith M. Ashman, Mentor 2004-2015. felixbonk@yahoo.com, gamekatpoker@gmail.com
- Fred Leibsle (Advisor) LeibsleF@umkc.edu
- Dr. Klee Irwin, Physicist. Colleague. klee@quantumgravityresearch.org
- Dr. John Ralston, KU Professor of Physics. MS Committee Co-Chair. Ralston@ku.edu
- Sabine Hossenfelder, Physicist, Supervisor (2023). Sabine.Hossenfelder@gmail.com
- Eileen Nutting, Nutting@KU.edu

Teaching:

- Devanshi Khetawat. Adventure School of Kansas. khetawatdevanshi@gmail.com
- Maria Alonso-Luaces. Director of Academic, Professional and Workforce Development, Office of Diversity and Inclusion, KU Med. Supervisor. MALonsoLuaces@kumc.edu
- Gabe Begaye, Mathematics Chair / Supervisor, Haskell Indian Nations University.
(GBegaye@Haskell.edu)

Public Speaking, Volunteering & Communication:

- Tim Ventura, Director, APEC. tim@timventura.com
- Deepak Chopra. Colleague. (Email private. Contact for further information.)
- Amanda Jane Snider. Colleague. da_fm@hotmail.com

**Additional professional references and character references available upon request.*