Dr. David Kordahl

Assistant Professor of Physics
Centenary College of Louisiana

david.kordahl@gmail.com
davidkordahl.net
ORCID iD: 0000-0003-2547-861X

Research Interests

- Electron energy-loss spectroscopy (EELS), plasmonics, and spatially resolved electron microscopy
- Quantum–classical correspondence, decoherence, and semiclassical modeling in scattering theory
- Computational physics with an emphasis on video analysis and signal processing
- Physics education research with an emphasis on laboratory design
- History and philosophy of physics, particularly their intersections with physics education

Research Highlights

- David Kordahl and Emma Foster, "Exploring Fourier methods with beer bottles," *American Journal of Physics*, March 2026. doi:10.1119/5.0245272. AIP Press Release.
- David Kordahl, "Inferring Trajectories of Floor-Bound Objects Using Video Analysis," *The Physics Teacher*, October 2025. doi:10.1119/5.0219972.
- David Kordahl, "Complementarity and entanglement in a simple model of inelastic scattering," *American Journal of Physics*, October 2023. doi:10.1119/5.0141389.
- Haotian Wen, David Kordahl, Inga C. Kuschnerus, Philipp Reineck, Alexander Macmillan, Huan-Cheng Chang, Christian Dwyer, and Shery L. Y. Chang, "Correlative Fluorescence and Transmission Electron Microscopy Assisted by 3D Machine Learning Reveals Thin Nanodiamonds Fluoresce Brighter," *ACS Nano*, August 2023. doi:10.1021/acsnano.3c00857.
- David Kordahl, "Agents in the Ether," *Inference: International Review of Science*, June 2022. doi:10.37282/991819.22.33. Letter by Richard Noakes; reply by David Kordahl, "Neither Denouncing nor Celebrating," doi:10.37282/991819.22.50.
- David Kordahl, Duncan T. L. Alexander, and Christian Dwyer, "Waveguide Modes Spatially Resolved by Low-Loss STEM-EELS," *Physical Review B*, March 2021. doi:10.1103/PhysRevB.103.134109.
- David Kordahl, Lance W. Q. Xu, Shery L. Y. Chang, and Christian Dwyer, "Prospects for detecting individual defect centers using spatially-resolved energy loss spectroscopy," *Physical Review B*, October 2019. doi:10.1103/PhysRevB.100.134103.
- David Kordahl and Christian Dwyer, "Enhanced vibrational electron energy-loss spectroscopy of adsorbate molecules," *Physical Review B*, March 2019. doi:10.1103/PhysRevB.99.104110.

Education

Arizona State University 2015–2020
Ph.D. in Physics (electron microscopy theory emphasis).

University of Kansas 2008–2011
M.S. in Physics (high-energy theory emphasis).

Wartburg College 2004–2008
B.A. degrees in Physics, Mathematics, Music, and English.

Teaching Experience (Centenary College of Louisiana)

Assistant Professor of Physics Fall 2020–present

- **Physics 103: Conceptual Physics** — Fall 2023, 2024.
- **Physics 113: Conceptual Physics Laboratory** — Fall 2023, 2024.
- **Physics 104: Physics I** — Spring 2021, 2022, 2023, 2024, 2025, 2026.
- **Physics 114: Physics I Laboratory** — Spring 2022, 2023, 2024, 2025, 2026.
- **Physics 105: Physics II** — Fall 2020, 2021, 2022, 2023, 2024.
- **Physics 115: Physics II Laboratory** — Fall 2020, 2021, 2022, 2023, 2024, 2025.
- **Physics 302: Modern Physics** — Spring 2021, 2023, 2025, 2026.
- **Physics 304: Modern Physics Laboratory** — Spring 2025, 2026.
- **Physics 312: Analytical Mechanics** — Spring 2024, 2026.
- **Physics 314: Analytical Mechanics Laboratory** — Spring 2024, 2026.
- **Physics 321: Thermal and Statistical Mechanics** — Fall 2025.
- **Physics 323: Thermal and Statistical Mechanics Laboratory** — Fall 2025.
- **Physics 395: Special Topics: Computational Physics** — Spring 2022.
- **Physics 402: Physics Capstone** — Fall 2025.

Student Research Advising

- Jasmine Jones and David Kordahl, "Measuring Boltzmann's Constant Using Video Microscopy of Brownian Motion," Louisiana Academy of Sciences Centennial Meeting, March 2026. Poster P50.
- Jackson Spataro (advised by D. Kordahl), "The Physics Behind GPS," Centenary Research Conference 2025, April 2025. Oral Presentation 1A-2.

- Emma Foster (advised by D. Kordahl), "Beer Bottles as Helmholtz Resonators," Centenary Research Conference 2025, April 2025. Poster 9.
- Jasmine Jones (advised by D. Kordahl), "Diffraction by Everyday Objects," Centenary Research Conference 2025, April 2025. Poster 10.
- Trinity Thomas (advised by D. Kordahl), "Constructing a Cloud Chamber to Identify and Record Cosmic Particles," Centenary Research Conference 2025, April 2025. Poster 11.
- Emma Foster (advised by D. Kordahl), "Modeling the Wilberforce Pendulum and Coupled Oscillations," Centenary Research Conference 2024, April 2024. Poster 9.
- Dylan Allred (advised by D. Kordahl), "Influence of the Magnus Force on the Trajectory of a Soccer Ball," Centenary Research Conference 2024, April 2024. Poster 10.
- Jackson Spataro (advised by D. Kordahl), "Mechanics of the Three-Body Problem," Centenary Research Conference 2024, April 2024. Poster 11.
- Maddie Vacula (advised by D. Kordahl), "Absorption and Fluorescence Measurements of Chlorophyll with SpectroVis Plus," Centenary Research Conference 2023, April 2023. Abstract 4D.8A.
- Porter Boudreaux (advised by J. Richardson and D. Kordahl), "Modeling and Applications with the Hodgkin-Huxley Model," Centenary Research Conference 2023, April 2023. Abstract 4D.5A.
- Coby Harris (advised by D. Kordahl), "Optical Rotation by Chiral Molecules," Centenary Research Conference 2023, April 2023. Abstract 5D.9B.
- Michael Smith (advised by D. Kordahl), "Calibrating Millikan's Oil Drop Apparatus," Centenary Research Conference 2023, April 2023. Abstract 5D.8B.

Professional Experience

Centenary College of Louisiana Fall 2020–present
Assistant Professor of Physics
Physics Department Chair (Fall 2023–present)
Engineering 3–2 Program Coordinator (Fall 2023–present)
Designed and reintroduced physics major (Spring 2024)
Academic Policy Committee (2023–present)
Institutional Effectiveness Committee (chair, 2022–2023)
Physics Faculty Search Committee (2021–2024)

Fellowship United Methodist Church May 2021–present
Music Director (pianist and choir director).

Arizona State University 2015–2020
Graduate Research Assistant (Fall 2016–Spring 2020).

- Physics 212, Physics II (recitation instructor): Fall 2015 (5 sections), Spring 2016 (5 sections), Spring 2017 (3 sections).
- Physics 132, Physics II Laboratory (lab instructor): Summer B 2016 (1 section).

- Physics 121, Physics I (recitation instructor): Summer A 2016 (1 section).

Mesa Public Schools 2011–2015
Science Teacher, Mesa, AZ.

- General Physics: 2012–2015 (nine sections).
- Earth and Space Science: 2014–2015 (four sections).
- Essential Elements of Science: 2012–2013 (two sections).
- Algebra 1: long-term substitute (2011–2012, four sections).
- Roaming substitute in science, math, music, and English (2011–2012).

University of Kansas 2008–2011
Graduate Student Fellow in Curriculum Development for Introductory Astronomy (Spring 2011).

- Physics 111, Introductory Mechanics: Fall 2010 (lab instructor, three sections).
- Physics 112, Electricity and Magnetism: Summer 2010 (lab instructor, two sections).
- Physics 212, Engineering Electricity and Magnetism: Fall 2009 and Spring 2010 (lab instructor, three sections each).
- Physics 211, Engineering Mechanics: Fall 2008 and Spring 2009 (lab instructor, three sections each).

Undergraduate Employment (Wartburg College) 2004–2008
Physics Homework Grader (General Physics, Fall 2007–Spring 2008).
Physics Lab Assistant (Classical Physics, Fall 2006–Spring 2007).
Program Annotator, Wartburg Community Symphony (five concerts, Fall 2007–Spring 2008).
Indiana University Physics REU Participant (Summer 2007).
Opinion Columnist, *The Trumpet* (Wartburg College student newspaper; Spring 2005, Spring 2006).

Grants and Awards

- Centenary College Student-Faculty Research Grant, underwritten by the C. M. Hutchinson Family Board of Regents Endowed Professorship for Outstanding Scholarship ($3,500 faculty pay + $2,500 student pay + $1,000 research budget = $7,000 total).
- Principal Investigator, Departmental Enhancement Grant (2020), LEQSF(2020–21)-ENH-DE-02, "Enhanced Laboratory for Optics/Modern Physics" (funds of $14,443 for updating lab equipment at Centenary College of Louisiana).
- Wally Stoelzel Physics Fellowship (2019), Arizona State University Department of Physics.
- Enhanced Data Generated by Electrons, 8th International Workshop on Electron Energy-Loss Spectroscopy and Related Techniques (2017), Student Travel Grant Recipient ($500).

- ETS Recognition of Excellence (2011), content mastery award for top 15% of educators in physics, math, and English.
- E. E. Slossen Award for Teaching Excellence (2010), top teaching assistant, University of Kansas Physics Department.
- Presser Music Scholar (2007) and Physics Student of the Year (2008), Wartburg College.

Conference Abstracts and Presentations

(* indicates presenter)

* David Kordahl, "Surface Losses and Decoherence in Electron Interferometry," *Louisiana Academy of Sciences Centennial Meeting*, March 2026. Abstract.

* David Kordahl, "Beer bottles as acoustical resonators: a teaching tool for the damped driven oscillator model," *Louisiana Academy of Sciences Annual Meeting*, March 2025. Abstract. Slides: PDF.

* David Kordahl, "From Image to Insight: Getting More out of Video Analysis," *Full STEAM Ahead Educator Symposium*, Centenary College of Louisiana, February 2025. Abstract. Slides: PDF.

* David Kordahl, "Millikan's Oil Drop Experiment as a Smartphone Lab?" *2024 AAPT Winter Meeting*, January 2024. Abstract: SUN-AC-04. Slides: PDF.

* David Kordahl, "Entanglement in a model of inelastic spectroscopy," *89th Annual Meeting of the Southeast Section of the APS*, November 2022. Abstract: H02.00004. Slides: PDF.

* David Kordahl, "Beats, Overtones, and Musical Temperament," *2022 AAPT Virtual Winter Meeting*, January 2022. Abstract: B7-02. Video: Underline. Slides: PDF.

* David Kordahl, "Historical Flirtations with the Physics of the Paranormal," *2021 AAPT Virtual Summer Meeting*, July/August 2021. Abstract: PS.E-MO-10.04. Video: YouTube. Slides: PDF.

* David Kordahl, "Cerenkov Excitation of Waveguide Modes in the Electron Microscope," *87th Annual Meeting of the Southeast Section of the APS*, November 2020. Abstract: F03.00006. Slides: PDF.

- David Kordahl and Christian Dwyer, "Harnessing Shape Effects for Adsorbate Signal Enhancement in Vibrational EELS," *Microscopy & Microanalysis 2019*, August 2019. doi:10.1017/S1431927619003775. Slides: PDF.
- David Kordahl, Duncan Alexander, and Christian Dwyer, "Spatially-resolved STEM-EELS of waveguide modes," M&M 2021 Meeting, August 2021. *Microscopy and Microanalysis* 27 (S1). doi:10.1017/S143192762100101X.
- Shery Chang, Haotian Wen, David Kordahl, and Christian Dwyer, "Measuring NV Centers in Diamond Nanoparticles using Electron Energy Loss Spectroscopy," M&M 2021 Meeting, August 2021. *Microscopy and Microanalysis* 27 (S1). doi:10.1017/S1431927621004499.

* David Kordahl and Christian Dwyer, "Particle Shape Effects in Vibrational Electron Energy-Loss Spectroscopy" (Poster 2), APS March Meeting, March 2018. Abstract: G60.339.

* David Kordahl and Christian Dwyer, "Particle Shape Effects in Vibrational EELS" (Poster 1), Enhanced Data Generated by Electrons 2017, May 2017. Abstract: P0009.

Colloquia and Panels

- "Adventures with Oscillators! Beer Bottles, Nanorods, and a Classical/Quantum Comparison," Weber State University, January 2025. Abstract. Slides: PDF.
- "Science and Story: A Panel Discussion," Centenary College of Louisiana, Full STEAM Ahead Educator Symposium, February 2024. Abstract.
- "If the microscopes work, what's the use of theory?" Marietta College, Physics Colloquium Series, January 2020.
- "Enhancing Vibrational Signals from Adsorbed Molecules in Electron Energy-Loss Spectroscopy," Arizona State University, Condensed Matter Journal Club, April 2019.

Organizational Membership and Workshops

- American Association of Physics Teachers (AAPT) – reviewer for *American Journal of Physics*.
- Louisiana Academy of Sciences (LAS) – executive council member.
- Advanced Laboratory Physics Association (ALPhA) – 2025 Laboratory Immersion Participant: *Evidence for Galactic Dark Matter with CHART – the Completely Hackable Amateur Radio Telescope*, Winona State University, Winona, MN.

Popular Essays and Reviews

3 Quarks Daily

- Conservative Postmodernism and the Stuck Culture Hypothesis (2026)
- The UFO Disclosure Trap (2026)
- Canali, Aristocrats, Ant-Men: David Baron on Mars (2025)
- How Much of Science is Secret? (2025)
- A Quantum Correspondence (2025)
- Tech Intellectuals and the "TESCREAL Bundle" (2025)
- Moral Infohazards for Statistical Selves (2025)
- George Bailey on the Bridge (2025)
- Bouncing Droplets Refute the Multiverse? (2024)

- Making Sense of "The Golem" (2024)
- Anthony Fauci's Limited Hangout (2024)
- Physical Analogies and Field Theory (2024)
- Free Will, Pragmatism, and Things Best Left Unsaid (2024)
- The Posthumous Trials of Robert A. Millikan (2024)
- Sympathy for the Deplorables? (2023)
- The Philosopher of Quantum Reality (2023)
- How Quantum Models Work (2023)
- Parenthood, Conservatism, and the Existing World (2023)
- Quantum Field Theory, "Easier Than Easy" (2023)
- The Incommensurable Legacy of Thomas Kuhn (2023)
- A Paradox Concerning Scientists and History (2022)
- What Entanglement Doesn't Imply (2022)
- The Limits of Conspiracy Debunking—Revisited (2022)
- Exorcising a New Machine (2022)
- Scientific Models and Individual Experience (2022)
- On Reading a Defense of William Shockley (2022)
- Which Scientific Bets Should Be Denied? (2022)
- Philip Anderson's Emergence as Himself (2021)
- Scavenging Science: On John Horgan and Tao Lin (2021)
- Meat and Pets: A Double Feature (2021)
- The Movie That Watches You (2021)
- Guessing With Physics (2021)
- The Slightly Wrong Physics of Spinning Muons (2021)
- The Limits of Conspiracy Debunking (2021)
- Glassholes Revisited (2021)
- Science and *The Phenomenon* (2021)
- The World and Its Mask (2020)
- Easy to Defend, Hard to Believe (2020)

- Tesla at the Movies (2020)
- Things Hang Together, Things Fall Apart (2020)
- Atoms for Aliens? (2020)
- Twilight of the Quantum Idols (2020)

The New Atlantis

- The Big Whimper (2022)
- Inventing the Universe (2020)
- Steven Weinberg Glimpses the Promised Land (2019)
- Did Thomas Kuhn Kill Truth? (2018)
- Pop Goes the Physics (2017)

Los Angeles Review of Books

- Higher Laughter: On Jim Holt (2018)
- The Prophets Leave Hometown: Three Physicists Try Philosophy (2015)
- Data Grubbers: Epidemiology, Sabermetrics, Octopus Paul, and You (2015)
- Does Science Need Hollywood? (2015)
- Fairy Tale Physics and Poisoned Cocktails (2013)
- Quantum Absolutism: Lee Smolin's *Time Reborn* (2013)

Other Venues

- Unlocking the Treasures (*Skeptical Inquirer*, 2015)
- Psychedelics for Suburbanites (*Motherboard*, 2015)
- How Physics is Like Three-Chord Rock (*Nautilus*, 2013)
- Something in the Water: Chinatown and L.A.'s Originary Sin (*Motherboard*, 2013)
- A Visit to the Shell of the Bomb (*Motherboard*, 2013)

Skills

Programming: Matlab/Octave, Python, COMSOL Multiphysics.
Typesetting and Design: LaTeX, Microsoft Office, LibreOffice, HTML/CSS, WordPress Suite.
Music: Violin, piano, and trumpet performance.