

# Dr. David Kordahl

Assistant Professor of Physics  
Centenary College of Louisiana

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## Research Interests

- Electron energy-loss spectroscopy (EELS), plasmonics, and spatially resolved electron microscopy
- Computational methods in laboratory design, including video analysis and signal processing
- Quantum–classical correspondence, decoherence, and semiclassical electron scattering
- History and philosophy of physics as resources for physics education

## Research Highlights

- David Kordahl, “Surface Excitations, Energy Loss, and Decoherence in Electron Interferometry,” preprint, July 2026. [arXiv:2606.01004](https://arxiv.org/abs/2606.01004).
- David Kordahl and Emma Foster, “Exploring Fourier methods with beer bottles,” *American Journal of Physics*, March 2026. [doi:10.1119/5.0245272](https://doi.org/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](https://doi.org/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](https://doi.org/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](https://doi.org/10.1021/acsnano.3c00857).
- David Kordahl, “Agents in the Ether,” *Inference: International Review of Science*, June 2022. [doi:10.37282/991819.22.33](https://doi.org/10.37282/991819.22.33). Letter by Richard Noakes; reply by David Kordahl, “Neither Denouncing nor Celebrating,” [doi:10.37282/991819.22.50](https://doi.org/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](https://doi.org/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](https://doi.org/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](https://doi.org/10.1103/PhysRevB.99.104110).

## Education

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|--------------------------------------------------------------------------------------------|-----------|
| <b>Arizona State University</b><br>Ph.D. in Physics (electron microscopy theory emphasis). | 2015–2020 |
| <b>University of Kansas</b><br>M.S. in Physics (high-energy theory emphasis).              | 2008–2011 |
| <b>Wartburg College</b><br>B.A. degrees in Physics, Mathematics, Music, and English.       | 2004–2008 |

## Appointments and Leadership

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| <b>Centenary College of Louisiana</b><br>Associate Professor of Physics, Shreveport, LA | Fall 2020–present |
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- Physics Department Chair (Fall 2023–present)
- Engineering Dual Degree Program Coordinator (Fall 2023–present)
- Designed and reintroduced physics major (Spring 2024)
- First-Year Curriculum Working Group (2026–present)
- Economic Policy Committee (2026–present)
- Academic Policy Committee (2023–2026)
- Institutional Effectiveness Committee (chair, 2022–2023)
- Physics Faculty Search Committee (2021–2024)

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| <b>Fellowship United Methodist Church</b><br>Music Director (pianist and choir director). | May 2021–present |
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| <b>Arizona State University</b><br>Graduate Research Assistant (Fall 2016–Spring 2020). | 2015–2020 |
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- Physics 212, Physics II (recitation instructor): Fall 2015, Spring 2016, Spring 2017 (13 sections).
- Physics 132, Physics II Laboratory (lab instructor): Summer B 2016 (1 section).
- Physics 121, Physics I (recitation instructor): Summer A 2016 (1 section).

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| <b>Mesa Public Schools</b><br>Science Teacher, Mesa, AZ. | 2011–2015 |
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- General Physics: 2012–2015 (9 sections).
- Earth and Space Science: 2014–2015 (4 sections).
- Essential Elements of Science: 2012–2013 (2 sections).

- Algebra 1 long-term substitute: 2012 (4 sections).
- Roaming substitute in science, math, music, and English (2011–2012).

### **University of Kansas**

2008–2011

Graduate Student, Lawrence, KS.

- Graduate Student Fellow in Curriculum Development, Introductory Astronomy (Spring 2011).
- Physics 111, Introductory Mechanics (lab instructor): Fall 2010 (3 sections).
- Physics 112, Electricity and Magnetism (lab instructor): Summer 2010 (2 sections).
- Physics 211, Engineering Mechanics (lab instructor): Fall 2008, Spring 2009 (6 sections).
- Physics 212, Engineering Electricity and Magnetism (lab instructor): Fall 2009, Spring 2010 (6 sections).

### **Wartburg College**

2004–2008

Undergraduate Student, Waverly, IA

- Physics Homework Grader (General Physics, Fall 2007–Spring 2008).
- Physics Lab Assistant (Classical Physics, Fall 2006–Spring 2007).
- Program Annotator, Wartburg Community Symphony (5 concerts, Fall 2007–Spring 2008).
- Indiana University Physics REU Participant (Summer 2007).
- Opinion Columnist, *The Trumpet* (student newspaper; Spring 2005, Spring 2006).

## **Teaching Experience at 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

- Hunter Hedges (advised by D. Kordahl), “An Inexpensive Schlieren Setup for Everyday Use,” Centenary Research Conference 2026, April 2026, [Poster 1](#).
- Jasmine Jones (advised by D. Kordahl), “Measuring Boltzmann’s Constant Using Video Microscopy of Brownian Motion,” Louisiana Academy of Sciences Centennial Meeting, March 2026, [Poster P50](#); and Centenary Research Conference 2026, April 2026, [Poster 3](#).
- 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.

## Conference Abstracts and Presentations

(\* indicates presenter)

- David Kordahl, “Electron Interferometry and EELS,” *Microscopy & Microanalysis 2026*, August 2026. [Abstract](#). Slides: [PDF](#)
- \* David Kordahl, “Surface Losses and Decoherence in Electron Interferometry,” *Louisiana Academy of Sciences Centennial Meeting*, March 2026. [Abstract](#). Slides: [PDF](#).
- \* 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, Duncan Alexander, and Christian Dwyer, “Spatially-resolved STEM-EELS of waveguide modes,” *Microscopy & Microanalysis 2021*, August 2021. [doi:10.1017/S143192762100101X](#).
- Shery Chang, Haotian Wen, David Kordahl, and Christian Dwyer. “Measuring NV Centers in Diamond Nanoparticles using Electron Energy Loss Spectroscopy,” *Microscopy & Microanalysis 2021*, August 2021. [doi:10.1017/S1431927621004499](#).
- \* 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 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](#).

## 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.

## 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) – peer-reviewer for *American Journal of Physics* and *The Physics Teacher*.
- 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.

## Skills

**Programming:** Matlab/Octave, Python, COMSOL Multiphysics.

**Typesetting and Design:** L<sup>A</sup>T<sub>E</sub>X, Microsoft Office, LibreOffice, HTML/CSS, WordPress Suite.

**Music:** Violin, piano, and trumpet performance.

## Popular Essays and Reviews

### 3 Quarks Daily

- [So You Want to Be a Scientist?](#) (2026)
- [The Manosphere in the Middle](#) (2026)
- [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)