**Debbie A. French, PhD**
Associate Professor of Science Education & Interim Director of Environment & Sustainability Studies
Wake Forest University
Department of Education
Winston-Salem, NC 27109
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## EDUCATION

| | | |
|---|---|---|
| Ph. D. | University of Wyoming<br>Curriculum & Instruction—Secondary Science Education<br>Dissertation: A three-part study focusing on pre-service teachers perceptions of science and engineering practices and authentic scientific inquiry (ASI); in-service teachers perceptions of ASI, perceived level of preparation to teach ASI, and perceived barriers of implementation; and an investigation of the impact of incorporating student-centered pedagogical techniques on students learning gains.<br>Chair: Dr. Andrea C. Burrows<br>Members: Drs. Hannah Jang-Condell, Ana Houseal, Victoria Gillis, Courtney McKim | August 2016 |
| M.A.T. | Miami University<br>Physics and Earth Science Education (7-12) | December 2004 |
| B.A. | Denison University<br>Individually designed major, "The Rhetoric of Physical Sciences" | May 2002 |
| A.S. | Kent State University<br>General Studies | May 2000 |

## AWARDS AND HONORS

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|---|---|
| 2026 | ASTE Tier I Early Career Award nominee |
| 2025 | WFU *Champions of Change* Campus Sustainability Award nominee |
| 2024 | National Center for Science Education Sound Science Fellow |
| 2024-present | Bitove Family Faculty Fellow, Wake Forest University |
| 2023 | NCSTA Dr. Don Bailey University/College Distinguished Service Award Winner |
| 2022 | ASTE 2022 John C. Park National Technology Leadership Initiative (NTLI) Fellowship Award Finalist |
| 2021 | ITEEAs Gerhard Salinger Award for Enhancing I-STEM Education Through Technological/Engineering Design-Based Instruction |
| 2017 | IEEE Integrated STEM Education Conference (ISEC) Best Paper Award Winner. |
| 2017 | University of Wyoming Outstanding Dissertation Award nominee |
| 2016 | Outstanding Graduate Student Award for Significant Accomplishments nominee |
| 2015 | Kay Patricia Cross Future Leaders Award nominee |
| 2014 | University of Wyoming Women of Distinction nominee |

**PROFESSIONAL EXPERIENCE**

HIGHER EDUCATION TEACHING EXPERIENCE

*Wake Forest University 2019-present*

*Graduate Teaching Experience*

| | | |
|---|---|---|
| EDU 783 | Methodology & Research II (Science) | Spring 22, 23 |
| EDU 781 | Methodology & Research (Science) | Fall 20, 21, 22 |
| EDU 717 | Instructional Design, Assessment & Technology | Fall 20, 21 |
| EDU 716 | Professional Growth Seminars | Summer 20, 23-25 |
| EDU 643 | Teaching Elementary STEM | Spring 20, 22, 24-26 |
| EDU 664L | Student Teaching Internship | Spring 20, 23 |
| EDU 665 | Professional Development Seminar | Spring 20, 24 |
| EDU 668 | Professional Experience in Education | Spring 23 |
| EDU 715 | Action Research | Fall 19, 22, 23 |
| EDU 654 | Science Content Pedagogy | Fall 19, 22, 23 |
| EDU 654L | Clinical Pedagogy Rounds | Fall 19 |
| EDU 693-B | Environmental Education Methods | Spring 25 |

*Undergraduate Teaching Experience*

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|---|---|---|
| FYS 100 | $CO_2$ and the Future of Earth | Fall 21-24; Spring 22 |
| FYS 100 | The Good Life: Exploring Global Perspectives | Spring 25, 26 |
| EDU 319 | Environmental Education Methods | Spring 25 |
| EDU 307 | Instructional Design, Assessment & Technology | Fall 20, 21; Sp. 23, 24 |
| EDU 364L | Student Teaching Internship | Spring 20 |
| EDU 365 | Professional Development Seminar | Spring 20 |
| EDU 298 | Elementary Science Methods | Spring 20, 22-26 |
| EDU 354 | Science Content Pedagogy | Fall 19, 20, 22, 24-5 |
| EDU 354L | Clinical Pedagogy Rounds | Fall 19, 20 |
| ENV 306-A | Environmental Job Skills Seminar | Spring 26 |
| ENV 391 | Environmental Issues and Global Health Independent Study | Spring 26 |
| EDU 393 | Advanced Elementary Science Methods Independent Study | Spring 26 |

*Wilkes University 2016-2019*

*Graduate Teaching Experience*

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|---|---|---|
| EDIM 502 | Project Based Learning (on-line) | Summer 17, 18 |
| EDIM 513 | Inquiry Based Learning (on-line) | Summer 17, 18 |

*Undergraduate Teaching Experience*

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|---|---|---|
| EES 280 280L | Principles of Astronomy | Fall 18 |
| EES | Principles of Astronomy Lab | Fall 18 |
| FYF 101 | First Year Foundations: Exploring Mars with LEGO Mindstorm Robotics | Fall 17, 18 |
| ED 375 | Middle Level & Secondary Education | Spring 17, 19 |
| ED 371 | Special Methods Sciences 7-12 | Fall 16, 18 |
| ED 370 | Science Early Childhood & Elementary Ed | Spring 17-19 |
| ED 191 | Educational Technology | Fall 16, 17, Spring 17-19 |
| ED 180 | Educational Psychology | Fall 2016, 2017, 2018 |

*University of Wyoming*
*Graduate Teaching Experience*

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|---|---|---|
| NASC 5120 | Earth Science Global MSC | Summer 16 |
| ASTR 4000 | Astronomy for Teachers | Summer 16 |
| EDCI 5250 | Advanced Topics in Pedagogy | Fall 14, 15 |
| NASC 5110 | Physical Science Global Perspectives | Summer 15 |
| EDCI 5959 | STEM Integration through Guitar Fabrication in the Classroom | Summer 15 |
| EDCI 5550 | Art and Science of Teaching | Summer 14, 16 |

*Undergraduate Teaching Experience*

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|---|---|---|
| ASTR 1050 | Survey of Astronomy | Fall 15 |
| EDSE 3275 | Secondary Science Education Methods I | Fall 14, 15 |
| EDSE 4500 | Residency in Teaching (Student Teaching Supervision) | Fall 14, 15 |

*Supervised Internship*

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|---|---|---|
| EDRE 5530 | Intro to Research (on-line course)<br>Mentor: Jennifer Weatherford | Summer 15 |

*Graduate Teaching Assistant*

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|---|---|---|
| EDCI 5870 | Seminar: Research II | Fall 15 |
| EDSE 3275 | Secondary Science Education Methods I | Fall 13 |
| EDSE 4275 | Secondary Science Education Methods II | Fall 13-15 |
| EDCI 5250 | Advanced Topics in Pedagogy | Fall 13 |
| EDRE 5550 | Action Research | Fall 13, 14 |

K-12 TEACHING EXPERIENCE

*New Philadelphia High School, New Philadelphia City Schools, New Philadelphia, OH*
Secondary Physics, Principles of Engineering (a Project Lead the Way course), & Physical Science Teacher 2007-2013

*Cambridge High School, Cambridge City Schools, Cambridge, OH*
Secondary Earth Science, General Science, & Physics Teacher 2005-2007

**PUBLICATIONS**

BOOKS AND CHAPTERS

Singer, T., Phillips, T., **French, D.** (2012). *Principles of Engineering: Workbook.* Delmar-Cengage Publishing. Clifton Park, NY: Delmar-Cengage Learning.

REFEREED ARTICLES

French, R. M., & **French, D. A.** (2025). Measuring the breaking strength of steel guitar strings. *The Physics Teacher*. #TPT24-AR-00217R.

**French, D. A.,** Houseal, A. K., & Flarend, A. (2025). Secondary core science teachers' perceptions of teaching climate change. *Journal of Geoscience Education*. 1-17.

**French, D. A.,** Rhew, B., Hauze, S., & Dorsey, S. (2023). Using ePortfolios as an authentic assessment tool for integrated STEM professional development. *Contemporary Issues in Technology and Teacher Education (Science). 23*(1).

Caldwell, E. & **French, D. A.** (2022). Coteaching: A formula for learning from and with colleagues. *Faculty Focus*. Magna Publications.

Nerozzi, A., & **French, D.** (2022). A Snapshot of Summer STEM Experiences for High School Students in Colleges and Universities in Pennsylvania. *Journal of the Pennsylvania Academy of Science*, *96*(1), 1-25.

**French, D. A.** & French, R. M. (2021). Guitar making as a teaching tool. *American Lutherie.* (144).

Ruckman, R., **French, D. A.**, & Houseal, A. (2021). An unforgettable journey: Eclipsed by students questions. *Science Scope. 44*(4).

**French, D. A.** & Burrows, A. C. (2018). Evidence of science and engineering practices in preservice secondary science teachers instructional planning. *Journal of Science Education and Technology*, *27*(6), 536-549**.**

Rebull, L. M., **French, D. A.,** Laurence, W., Roberts, T., Fitzgerald, M. T., Gorjian, V., & Squires, G. K. (2018). Major outcomes of an authentic astronomy research experience professional development program: An analysis of 8 years of data from a teacher research program. *Physical Review Physics Education Research*, *14*(2), 020102.

Rebull, L. M., Roberts, T., Laurence, W., Fitzgerald, M. T., **French, D. A.,** Gorjian, V., & Squires, G. K. (2018). Motivations of educators for participating in an authentic astronomy research experience professional development program. *Physical Review Physics Education Research*, *14*(1), 010148.

Hauze, S. & **French, D. A.** (2017). Technology-supported science instruction through problem-based learning with integrated STEM guitar building: The case for STEM and non-STEM instructor success. *Contemporary Issues in Technology and Teacher Education (Science), 17*(4).

**French, D. A.** & Burrows, A. C. (2017). Inquiring astronomy: Incorporating student-centered pedagogical techniques in an introductory college science course. *Journal of College Science Teaching, 46*(4), 24-32.

Walwema, G., **French, D.**, Verley, J., & Burrows, A. (2016). Is classical mechanics a prerequisite for learning modern physics? *Physics Education, 51*.

Burrows, A. C., DiPompeo, M. A., Hickox, R. C., Myers, A., Schwortz, A. C., **French, D. A**., & Borowczak, M. (2016). Authentic science experiences: Precollegiate science educators successes and challenges during professional development. *Problems of Education in the 21st Century, 70,* 59-73.

Slater, T. F., Burrows, A. C., **French, D. A.,** Sanchez, R. A., & Tatge, C. B. (2014). A proposed astronomy learning progression for remote telescope observation. *Journal of College Teaching and Learning, 11*(4), 197-206.

French, R. M., **French, D. A.,** & Zehrung, C. (2012). Initial Behavior of Nylon Guitar Strings. *Savart Journal. 1(2),* 1-7.

CREATIVE CONTRIBUTIONS

Guitarbuilding.org (Co-PI for grant)

LASSI PD website and Astronomy Days: Black Holes PD website
http://physics.uwyo.edu/~aschwortz/LASSI/activities.html
http://physics.uwyo.edu/~mike/workshop

**French, D. A.** (2013). Physical science lessons relating to heat energy, temperature, and infrared radiation. *NASA/IPAC.* http://coolcosmos.ipac.caltech.edu/page/lesson_plans

**INVITED TALKS AND PANEL PRESENTATIONS**

Fitzgerald, M., **French, D. A.,** McKinnon, C., Wallace, C. (2024, June 4). Future Research in Astronomy Education. AstroEdUNC. University of North Carolina Chapel Hill.

Catanoso, J., **French, D. A.**, Benjamin, S. G. (2024, April 24). Environmental justice in the academy. Headlines & footnotes: Environmental justice in an age of planetary crisis. Wake Forest University Environmental and Epistemic Justice Initiative.

Rhew, B., & **French, D. A.** (2023, April 13). Teaching with phenomenon. North Carolina Science Leadership Association.

**French, D. A.** (2023, January 21). Teaching STEM in middle school. STEM Outreach Corps Training. Wake Downtown.

**French, D. A.**, Soriano, C., Hill, B. (2021). Movement in the molecular: Using dance to model science concepts. Wake Forest University Department of Education's Professional Learning Series.

**French, D. A.** (2020, October 26). Faculty professional development institutes: Using the guitar as a vehicle to teach integrated STEM concepts. Wake Forest University Department of Education's Professional Learning Series.

**CONFERENCE PRESENTATIONS**

**French, D.** (2026, January). Leveraging First Year Seminars to Broaden Collegiate Climate Science Course Offerings. Association of Science Teacher Educators, Chicago, IL.

Kuper, O., Rutherford, T., Forester, D., Rebull, L., Gorjian, V., Blackwell, J., **French, D.,** Kaiser, D., Newland, J., Orr, L., Ramseyer, E., Schwartz, A., Urbanowski, V. (2026, January). From Young Stars to Active Galaxies: Development of Foundational Lessons for Authentic Astronomy Research. American Astronomical Society, Phoenix, AZ.

Davis, B., **French, D.** (2025, November). Teaching Climate Change: Photosynthesis & NC Standards. North Carolina Science Teachers Association, Winston-Salem, NC.

**French, D.,** Houseal, A. (2025, January). Equipping educators: Core secondary science teachers experiences. Association of Science Teacher Educators, Long Beach, CA.

**French, D.,** Reynolds, M. (2025, January). Collaborative conversations: Enhancing recruitment in teacher education. Association of Science Teacher Educators, Long Beach, CA.

Rebull, L., Gorjian, V., **French, D.** (2025, January). NITARP, the NASA/IPAC Teacher Archive Research Program. American Astronomical Society, Washington, D. C.

Ciambra, R., Rutherford, T., Kuper, O., Schwartz, A., Strasburger, D., Kelly, S., Urbanowski, V., Kaiser, D., Van Winkle, E., Rebull, L., Newland, J., Perry, J., Ramseyer, E., Blackwell, J., **French, D.** (2025, January). Curricula for educators to access authentic data and scientific research experiences. American Astronomical Society, Washington, D. C.

Schwartz, A., Ciambra, R., Kuper, O., Blackwell, J., **French, D.** Kaiser, D., Kelly, S., Orr, L., Perry, J., Ramseyer, E., Rebull, L., Rutherford, T., Strasburger, D., Urbanowski, V. (2025, January). Reach for the stars: Authentic Astronomical research in middle school. American Astronomical Society, Washington, D. C.

Calhoun, B., **French, D.** (2024, November). Creating professional development for K-12 educators). North Carolina Science Teachers Association, Winston-Salem, NC.

Long, M., Stremlow, S., **French, D.** (2024, November). Immunity unlocked: An inquiry into vaccines. North Carolina Science Teachers Association, Winston-Salem, NC.

Riordan, A., Hendrick, W., **French, D.** (2024, November). Cafeteria to compost to landfill: Student-driven research to enact change. North Carolina Science Teachers Association, Winston-Salem, NC.

**French, D.** Rhew, B., Hauze, S. (2024, January). Increasing STEM teacher motivation through professional development. Association of Science Teacher Educators, New Orleans, LA.

Rebull, L., Blackwell, J., Ciambra, R., **French, D.**, Goeldi, N., Gorjian, V., Granucci, N., Gustavson, K., Johnson, C., Kuper, O., Newland, J., Orr, L., Rutherford, T., Sperling, A., Urbanowski, V., Van Winkle, E., (2024, January). NITARP lesson plans: Bite-size pieces of authentic science research experiences. American Astronomical Society, New Orleans, LA.

Calhoun, B., **French, D.,** Rhew, B. (2023, November). The power of persuasion: Integrating climate change into our curriculum to foster awareness in classrooms. North Carolina Science Teachers Association, Winston-Salem, NC.

Moreira, D., Reese, S., **French, D.** (2023, November). Making abstract chemistry concepts visible through low-cost manipulatives. North Carolina Science Teachers Association, Winston-Salem, NC.

**French, D. A.** & Houseal, A. (2023, July). Climate curricular connections identified by core science teachers. National Association of Geoscience Teachers Earth Educators Rendezvous. Pasadena, CA.

**French, D. A.,** Hauze, S., & Rhew, B. (2023, January). Faculty outcomes from the integrated STEM guitar professional development institutes. Association of Science Teacher Educators. Virtual/Salt Lake City, UT.

**French, D. A.,** Rhew, B. (2022, November). Supporting Middle & Secondary Science Student Teachers with the NGSS. North Carolina Science Teachers Association. Winston-Salem, NC.

Hauze, S. & **French, D. A.** (2022, April). A look back at 10 years of the STEM guitar project. NSF STEM Guitar Summit. Virtual conference.

**French, D. A.** & Rhew, B. (2022, November). Supporting middle & secondary science student teachers with the NGSS. North Carolina Science Teachers Association. Winston-Salem, NC.

**French, D. A.,** Hauze, S., & Dorsey, S. (2022, January). Documenting the STEM guitar build: using ePortfolios as an evaluation tool for integrated STEM professional development. Association of Science Teacher Educators. Virtual conference.

**French, D. A.** & French, R. M. (2021, June). Teaching technical & 21st century skills through guitar building. Polytechnic Summit 2021. Virtual/Dublin, Ireland.

Peitzman, M., **French, D. A.,** Singer, T., French, R. M., & Hunt, D. (2021, March). STEM guitar COVID edition: Remote hands-on learning. International Technology and Engineering Educators Association. Virtual conference.

**French, D. A.,** Peitzman, M., French, R. M., & Hauze, S. (2021, January). Delivering integrated STEM professional development in an online environment. American Association of Physics Teachers. Virtual conference.

Peitzman, M. & **French, D. A.** (2020, October). STEM guitars new paradigm: Remote hands-on learning. National Science Foundation Advanced Technical Education. Virtual conference.

**French, D. A.,** Hauze, S., French, R. M., Hunt, D., & Singer, T. (2020, July). Eleven years of faculty professional development in STEM: Lessons learned. American Association of Physics Teachers. Virtual conference.

**French, D. A.**, Hauze, S., French, R. M., Hunt, D., & Singer, T. (2020, January). Equipping teachers to engage underrepresented students in STEM. American Association of Physics Teachers Conference. Orlando, FL.

**French, D. A.**, Hauze, S., French, R. M., Hunt, D., & Singer, T. (2019, July). Using guitars as a vehicle for problem-based learning. American Association of Physics Teachers conference. Provo, UT.

Singer, T. & **French, D. A.** (2019, July). STEM learning using electric guitars, CNC, and now acoustic guitars. High Impact Technology Exchange Conference. St. Louis, MO.

**French, D. A.** Hauze, S., French, R. M., Hunt, D., & Singer, T. Using guitars as a vehicle for problem-based learning. (2019, July). American Association of Physics Teachers conference. Provo, UT.

**French, D. A.** French, R. M., Hauze, S., Hunt, D., & Singer, T. (2019, January). Good vibrations: Using the acoustic guitar to teach physics concepts. American Association of Physics Teachers conference. Houston, TX.

**French, D. A.** (2018, July). Exploring Mars with LEGO Mindstorm Robotics: A FYF college course. American Association of Physics Teachers. Washington, D. C.

**French, D. A.** (2018, August). Using an electric guitar as a vehicle to teach introductory electronics concepts. American Association of Physics Teachers. Washington, D. C.

Sitch, K., Stecco, D., Rempe, C., Cugini, N., **French, D. A.,** & Bednarz III, E. (2018, April). Launching into the future: Using a ping pong ball cannon to demonstrate physics and integrated STEM concepts. American Association of Physics Teachers Central Pennsylvania Section. Pottsville, PA.

**French, D. A.,** Hauze, S., French, R. M., Hunt, D., & & Singer, T. (2018, January). The physics of guitar building: The STEM guitar project. American Association of Physics Teachers conference. San Diego, CA.

**French, D. A.,** Hauze, S., Singer, T., French, R. M., & Hunt, D. (2017, July). Closing the STEM skills gap with guitars. Poster presentation at the American Association of Physics Teachers conference. Cincinnati, OH.

**French, D. A.** (2017, March). Next-generation lesson planning: Translating preservice secondary science teachers research into lesson plans. Wilkes University Scholarship Symposium. Wilkes-Barre, PA.

Hauze, S., **French, D.,** Castaneda-Emenaker, I., French, M., & Singer, T. (2017, March). Quantifying K12 and college student learning outcomes of STEM guitar building. Institute of Electrical and Electronics Engineers Integrated STEM Education Conference (ISEC). Princeton, NJ.

**French, D. A.,** & Burrows, A. (2017, February). Incorporating student-centered pedagogies in an undergraduate astronomy course. American Association of Physics Teachers conference. Atlanta, GA.

**French, D. A.,** Hauze, S., French, R. M., Singer, T., & Castenada-Emenaker, I. (2017, February). Making music: Learning physics and STEM through making electric guitars. American Association of Physics Teachers. Atlanta, GA.

**French, D. A.,** Burrows, A., & Slater, T. (2016, March). Core concepts to broader topics: Shifting the focus in Astro 101. University of Wyoming College of Education Research Symposium. Laramie, WY.

**French, D. A.** & Burrows, A. (2016, March). Evidence of inquiry, authentic scientific inquiry, and STEM integration in pre-service secondary science teachers instructional planning. University of Wyoming College of Education Research Symposium. Laramie, WY.

**French, D. A.** & Burrows, A. (2016, March). Teachers perceived barriers to implanting authentic scientific inquiry. University of Wyoming College of Education Research Symposium. Laramie, WY.

Burrows, A., Borowczak, M., **French, D.,** Myers, A., & Schwortz, A. (2016, March). K-12 STEM Professional development: Lessons learned from LASSI. University of Wyoming College of Education Research Symposium. Laramie, WY.

**French, D. A.** & French, R. M. (2016, March). Teachers' perceptions of STEM after a STEM guitar institute. American Association of Physics Teachers conference. New Orleans, LA.

**French, D. A.,** Burrows, A. C. & Slater, T. F. (2016, January). Shifting from core concepts to integrated topics in Astro 101: Calculating the amount of dark matter in a galaxy using the Doppler Effect & Newtons Law of Universal Gravitation. American Association of Physics Teachers. New Orleans, LA.

**French, D. A.** & Burrows, A. C. (2016, January). Exploring NITARPs impacts on teachers' knowledge, attitudes, and teaching. Association of Science Teacher Educators. Reno, NV.

**French, D. A.,** Burrows, A. C., Castanada-Emenaker, I., French, R. M., Hunt, D., & Singer, T. (2015, October). Integrated STEM with guitars: Teachers' perceptions, new learning activities and assessment tools. Association of Science Teacher Educators/National Science Teachers Association. Reno, NV.

Burrows, A., Myers, A, DiPompeo, M., Borowczak, M., Schwortz, A., **French, D.**, Hall, S., & Peterson, F. (2015, October). Partnerships: A systemic study of two professional developments. Association of Science Teacher Educators/National Science Teachers Association. Reno, NV.

**French, D. A.,** Burrows, A. C., & Meyers, A. D. (2015, January). Launching astronomy: standards and STEM integration (LASSI). American Astronomical Society. Seattle, WA.

**French, D. A.**, Burrows, A. C., & Slater, T. F. (2014, January). A qualitative study on NITARPs impacts on teachers' science teaching. American Association of Physics Teacher. Minneapolis, MN.

**French, D. A**., Huber, T., Singer, T., Castenada-Emenaker, I., Hunt, D. & Aikens, M. (2014, January). Guitars in the classroom? Absolutely! Teaching physics/STEM with guitars. Poster presented at the American Association of Physics Teachers. Minneapolis, MN.

**French, D. A.,** & Burrows, A. C. (2014, March). The evolution of pre-service biology teachers' attitudes toward STEM integration due to intervention in Methods I and II. University of Wyoming College of Education Research Symposium. Laramie, WY.

Burrows, A. C., Slater, T., Borowczak, M., & **French, D.** (2013, December). Integrated STEM- What does it mean to educators? Association of Science Teacher Educators. San Antonio, TX.

Burrows, A. C., Slater, T., & **French, D.** (2013, December). A proposed integrated STEM Framework. National Science Teachers Association. Denver, CO.

Slater, S., Slater, T., & **French, D.** (2013, December). Whirling planets and stars: Using a kinesthetic approach to understanding the seasons. National Science Teachers Association. Denver, CO.

**French, D. A.,** Slater, T. F., & Burrows, A. C. (2013, June). First steps toward exploring NITARPs impacts on teachers knowledge, attitudes, and teaching. American Astronomical Society. Indianapolis, IN.

**French, D. A.**, Haynes, A., Reynolds, T., Peterson, F., Blanco, T., Benham-Deal, T., & Vincenti, V. (2013, October). Session for K-12 Teachers—Consumer Information Conference. Session Leader. University of Wyoming. Laramie, WY.

Piper, M., **French, D.**, Barge, J., Novatne, L. J., Rebull, L. M., Ali, B., Laher, R., & Armstrong, J. (2013, January). How do astronomers know that? Educating teachers, students, and the public on HOW you discover young stars. American Astronomical Society. Long Beach, CA.

Novatne, L. J., Mattrocce, T., Milan, A., Ouinonez, A., Rebull, L. M., Barge, J., Amayo, R., Bieber, H., Block, L., Cheung, E., Cruz, A., Elkin, D., Figueroa, A., Jakus, M., Kelo, A., Larson, O., Lemma, B., Li, Y., Loe, C., Maciag, V., Moreno, N., Nevels, M., Pezanoski-Cohen, G., Short, M., Skatchke, K., Tur-Kaspa, A., Zegeye, D., Armstrong, J., Bonadurer, B., **French, D**., Free, B., Miller, C., Scherich, H., Willis, T., Koenig, X., Laher, R., Padgett, D., Piper, M., Willis, T., Koenig, X., Laher, R., Padgett, D., Piper, M., Pavlak, A., Venezio, E., & Ali, B. (2013, January). Young star candidates in BRC 27. American Astronomical Society. Long Beach, CA.

**French, D. A.** & Singer, T. (2012, March). Teaching physics and related STEM subjects with electric guitars. National Science Teachers Association. San Francisco, CA.

**French, D. A.** & Singer, T. (2011, March). Teaching physics and STEM with electric guitars. National Science Teachers Association. San Francisco, CA.

**GRANT ACTIVITY**

| **Year** | **Role** | **Grant** | **Budget** *Sponsor* **(Start/End)** | **Funding** |
|---|---|---|---|---|
| 2025 | PI | Student Lunch & Learn with author Katie Worth | $825 WFU Center for Literacy Education | Awarded |
| 2024 | PI | WFU Environmental & Epistemic Grant to host a book talk by Katie Worth | $3000 WFU EEJI & the Mellon Foundation | Awarded |
| 2024 | PI | WFU Environmental & Epistemic Justice Initiative Seminar Convener | $10,000 WFU EEJI & the Mellon Foundation | Awarded |
| 2024 | Faculty Member | FOCUS Grant: Collaboratively plan an FYS course with faculty in London, England. | WFU Provost/FOCUS travel grant | Awarded |
| 2023 | Faculty Member | Provost Travel Fund for Faculty Travel | $1500 | Awarded |
| 2023 | PI | Climate Change Professional Development for K-12 Faculty [with Brian Calhoun] | $4000 CEES Seed Grant | Awarded |

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| 2023 | Co-PI | Deans Office Research & Experiential Learning Fund [PI: Brian Calhoun] | $3000 Wake Forest University Spring 2023 | Awarded |
| 2022 | PI | "Localize My Course" summer planning grant. | $3000 The Mellon Foundation | Awarded |
| 2021-2026 | Advisory Board | Next-level, Robotic Telescope-Based Observing Experiences to Boost STEM Enrollments and Majors on a National Scale [PI: Dr. Daniel Reichart] | $2,981,738 DoD #HQ0034-21-S-F001 | Awarded |
| 2021-2026 | Advisory Board | Collaborative Research: STEM Attitude, Self-Efficacy, and Career-Intention Gains with Robotic Telescope-based Observing Experiences for Introductory Astronomy Students [PI: Dr. Daniel Reichart, coPI: Dr. Tim Spuck] | $1,144,440 NSF IUSE #2013300 | Awarded |
| 2021 | Co-PI | RET Site: Educating the Whole Engineer: Liberal Arts Engineering Research for Teachers in Elementary Schools (LAERTES) [Team: Dr. E. Henslee, Dr. K. Young, Dr. D. French, B. Rhew | $599,411 NSF $599,411 | Not Awarded |
| 2019 | Co-PI | The Science of Winston-Salem: Advancing Informal STEM Learning [Team: Dr. R. Alexander (Biochemistry), Dr. D. French, Dr. S. Brady (WSFCS), Dr. M. Brady (WSFCS), A. James, D. Oberti] | $1,270,163 NSF AISL, DRL #2006007 | Not Awarded |
| 2019 | Co-PI | Academic STEM Excellence Program [Team: Dr. K. Young (Engineering), Dr. E. Cole (Shalom, Inc.), Dr. D. Johnson (WSSU), Dr. A. Pulliam (WF School of Medicine) | $677,945 NSF Discovery Research K-12, DRL #2010529 | Not Awarded |
| 2018 | Curriculum Director | Impact: Restoring our Lands & Legacy [Team: Hughes & French] | $84,215 US EPA EE R3 | Not Awarded |

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| 2017 | Co-PI | Teaching Climate Change Through Authentic Scientific Inquiry [Team: Finkenbinder & French] | Cedar Tree Foundation $39,180 | Not Awarded 9/30/17 |
| 2016 | Co-PI, Executive Committee | The STEM Guitar Project [Team: Singer, French, D., French, R. M., Hauze] | $1,199,233 NSF ATE DUE #1700531 (2017-2022) | Awarded 10/7/2016 |
| 2016 | Co-PI | Reconstruction of Holocene climate transitions in central and northeastern North America using lake sediment geochemistry and modeling [Team: Finkenbinder, Steinman, French] | $227,461 NSF P2C2 #17002717 | Not Awarded 10/17/2016 |
| 2014 | External Evaluator | *The Artful Craft of Science (TACoS).* [Team: Burrows & Russell] | $10,000 *Sigma Aldrich/UW Foundation* (2014-2015) | Awarded |
| 2014 | Consultant | *Launching Astronomy Standards and STEM Integration (LASSI)*. [Team: Burrows & Myers] | ~$165,191 *DOE, WDE, MSP* (2014-2015) | Awarded (Grant #WY 140202) |
| 2014 | External Evaluator | *Science (STEM) Summer Camp in Douglas, WY* [Team: Burrows] | $17,000 *Ellbogen Deans Excellence Fund* | Awarded |
| 2013 | Travel grant recipient | *University of Wyoming Summer Graduate Research/Graduate Student Enhancement Grant*. [Team: French, D., Sanchez, R.] | $2000 *University of Wyoming* (2013) | Awarded |
| 2013 | CoPI | *LEAD with GUITARS in STEM.* [Team: Singer, French, D., French, R., Aikens, Brown, Rabe, Hunt, Emenaker] | $1,300,000 *NSF ATE DUE* #1304405 (2014- 2016) | Awarded |
| 2013 | External Evaluator | *PLACE, Year 3* [Team: Muir Welsh, Wachob] | $243,530 *MSP Title II* (2014) | Awarded |
| 2012 | Consultant | *Collaborative Research – The Hidden Side of Rapidly Growing Black Holes: Host Masses and Evolution of* | $294,228 *NSF AST* (Sept 2012-Aug 2015) | Awarded (Grant #1211112) |

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| | | *Obscured Quasars with SDSS and WISE.* [Team: Myers & Burrows] | | |
| 2009 | CoPI | *Faculty Professional Development in Design, Construction, Assembly, and Analysis of a Solid Body Guitar Design.* [Team: Aikens, French, D., French, R. Brown, Rabe] | $987,000 *NSF ATE DUE #0903336* (2010-2013) | Awarded |

**PROFESSIONAL AFFILIATIONS**

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|---|---|
| ASTE | Association of Science Teacher Educators |
| AASHE | Association for the Advancement of Sustainability in Higher Education |
| AACTE | American Association of Colleges for Teacher Education |
| NAGT | National Association of Geoscience Teachers |
| NSTA | National Science Teachers Association |
| NCSTA | North Carolina Science Teachers Association |

**SCIENCE RESEARCH EXPERIENCE**

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|---|---|
| January 2012-January 2013 | NASA/IPAC Teacher Archive Research Program (NITARP), Collaboration with Caltech/IPAC. |
| Fall 2010-Sp. 2011 | Assessing Radio Luminosity and Spin Parameters for Millisecond Pulsars. Collaboration with Cornell University |
| Fall 2009-Sp. 2010 | Initial Behavior of Nylon Guitar Strings. Collaboration with Purdue University & D'Addario Guitar Strings |

**EDUCATION RESEARCH EXPERIENCE**

Core science teachers' perceptions of teaching climate change (2019-present).

Incorporating science research and authentic scientific inquiry in the K-12 classroom. 2013-present.

K-16 Teacher professional development in STEM. 2010-present.

Preservice middle and secondary teachers incorporating their senior science research projects into NGSS-aligned unit plans showcasing authentic scientific inquiry. 2016-present.

Astro 101 students core knowledge transfer to broader topics: 2015.

Perceptions of writing among STEM and non-STEM majors with a particular focus on women in STEM. 2014-present.

Pre-service and in-service teacher perceptions of inquiry, iSTEM, and authentic scientific inquiry: 2013-present.

Pre-service and in-Service teacher perceptions of STEM: 2013-present.

Changes in teachers' classrooms due to participation in research experiences for teachers (RETs): 2013-present.

**PROFESSIONAL DEVELOPMENT PROVIDED**

Environmental & Epistemic Justice Initiative Research Seminar facilitator. Wake Forest University. Funded by WFU EEJI & the Mellon Foundation. Spring 2025.

Climate Change Professional Development for K-12 Faculty. Wake Forest University. Spring 2024.
Faculty Peer Co-Facilitator. Wake Forest University Department of Education. Summer 2020.
STEM Guitar Faculty Professional Development Institutes:

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|---|---|
| 2020 | Electric Guitar Virtual STEM Workshop |
| 2018 | Hopkins County Career & Technology Center, Madisonville, Kentucky |
| 2017 | Grants Pass High School, Grants Pass, Oregon<br>Mohawk High School, Marcola, Oregon (Lead) |
| 2015 | Laramie High School/University of Wyoming, Laramie, Wyoming (Lead) |
| 2014 | Central Connecticut University, New Britain, Connecticut |
| 2013 | Orange Coast College, Costa Mesa, California |
| 2012 | Ventura College, Ventura, California |
| 2010, 2011 | Butler County Community College, Butler, Pennsylvania |

Next Generation Science Standards PD for the Science in Motion program. Wilkes University, Wilkes-Barre, PA. May 8, 2019.
Wilkes Universitys Teaching with Technology Week: "Using Google Forms for Assessments and Surveys." August 16, 2018.
Act 48 Earth and Environmental Science Day. Wilkes University. April 8, 2017.
Order of Magnitude Estimation through two NSF-sponsored grants with Dartmouth College (NSF 1515364), and the University of Wyoming (NSF 1515404). Nov. 30, 2016.
Launching Astronomy: Standards and STEM Integration K-12 teacher professional development workshop. University of Wyoming. July 28-August 8, October 24-25, 2015; Feb. 27-28, March 27-28, 2016.
Astronomy Days (Black Holes) K-12 teacher professional development workshop, University of Wyoming. June 16-18, 2014.

**PROFESSIONAL DEVELOPMENT**

Geoscience Education Research: Statistics in Geosciences. Earth Educators Rendezvous. SERC. July 2021.
Magnolia Curriculum Project. Wake Forest University. May 2021.
Faculty Peer Mentor Training. Wake Forest University. June 2020
Pulsar Search Collaboratory. Spring 2020.
Quality Matters: Designing Your Online Course. Feb. 8, 2018.
Quality Matters: Applying the QM Rubric. Feb 9, 2018.
Eyes on NASA. December 8, 2016.
Teaching and Technology (TnT) Series: Easy Data Visualization with Tableau—March 2016, Laramie, Wyoming.
Teaching and Technology (TnT) Series: Working Effectively with Students Whose First Language is Not English—March 2016, Laramie, Wyoming.
NASA FINESSE Faculty Institute for Earth and Space Science Education –Association of Science Teacher Education – January 2014, San Antonio, Texas.
ASTRO 101 Teaching Workshop, Center for Astronomy and Physics Education Research – CAPER-CON – June 2013, Hilo, Hawaii.
Center for Astronomy Education Tier I Teaching Excellence Workshop – American Astronomical Society – June 2013, Indianapolis, Indiana.

**MEDIA HIGHLIGHTS**

NSTA Reports. (September 2015). *Studying STEM by building guitars. 27*(3).

UW Website: College of Education College News Feature. Guitar Building Workshop Revolves Around STEM Teaching. http://www.uwyo.edu/uw/news/2015/08/guitar-building-workshop-revolves-around-stem-teaching.html

Laramie Boomerang, Laramie, Wyoming. *Teachers hope to take guitar-themed lessons into classrooms: A guitar workshop in Wyoming offers educators new ways to look at teaching science, engineering, technology, and math.* http://www.laramieboomerang.com/news/local_news/image_791d6b62-3a5c-11e5-8505-37f8acee02a9.html
See also, http://www.usnews.com/news/stem-solutions/articles/2015/08/10/teachers-hope-to-take-guitar-themed-lessons-into-classrooms
And, http://ccweek.com/article-4707-strumming-a-stem-lesson.html

University of Wyoming Website: *Wyoming Teachers Gain STEM Skills at UW*. http://www.uwyo.edu/uw/news/2015/07/wyoming-teachers-gain-stem-skills-at-uw.html

University of Wyoming Website: College of Education College News Feature for 2014. (October 21, 2014). Student-created lessons address common science misconceptions. http://www.uwyo.edu/education/deans-office/college-news/2014/science misconceptions.html

**SERVICE & OUTREACH**

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|---|---|
| 2024-Present | Associate Director of Graduate Education, Department of Education |
| 2024-Present | NAGT Teacher Education Division & Webinar Committee member |
| 2023-Present | Graduate Honor Council Committee Member |
| 2023 | ASTE Membership and Participation Committee Member |
| 2023 | NAGT Webinar Committee Member |
| 2022-Present | Student Leadership Council faculty support |
| 2022-2025 | Contemporary Issues in Teacher Education-Science Editorial Review Board |
| 2022-2025 | Innovations in Science Teacher Education Editorial Review Board |
| 2021-2022 | ASTE co-Coordinator for the Science Teacher Professional Development-Middle/Secondary Conference Strand |
| 2021-Present | Student Recruitment Committee Chair |
| 2021 | Elementary & Secondary Education Committee Member |
| 2021 | Curriculum, Assessment, & Accreditation Committee Member |
| 2021 | Schools, Education, & Society Committee Member |
| 2020 | Chair for the national Committee for Physics Teacher Preparation American Association of Physics Teachers (AAPT) |
| 2020 | Department of Education Course Evaluation Committee |
| 2020-Present | Department of Education Partnership Advisory Committee |
| 2019-Present | Wake Forest University Graduate School Faculty Member |
| 2019-Present | Piedmont Energy Alliance Curriculum Consultant |
| 2019-Present | Wake Forest University Department of Education edTPA/Assessment Committee |
| 2019-Present | Wake Forest University Department of Education Graduate Committee |

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| 2019-2020 | Wake Forest University Department of Education Awards Committee |
| February 2020 | Community-Based Global Learning: Education Workshop—Elementary Science Education |
| February 2020 | North Carolina Science Olympiad Winston-Salem Regional Tournament Event Leader for Middle School Astronomy, "Reach for the Stars B" |
| January 2020 | Forsyth County Teacher Grant reviewer |
| 2019-Present | *The Science of…Winston-Salem* Committee Member |
| October 2019 | Project Pumpkin Booth Volunteer |
| August 2019 | Faculty House Calls Volunteer |
| 2019 | Vice Chair for the national Committee for Physics Teacher Preparation American Association of Physics Teachers (AAPT) |
| 2019-Present | Reviewer for the *Contemporary Issues in Technology and Teacher Education-Science* |
| 2018-Present | Reviewer for the *Journal of Science Education and Technology* (JOST) |
| 2018 | AAPT Central Pennsylvania Section Vice President. |
| 2018 | AAPT Winter 2019 Conference Paper Sort |
| 2018 | Reviewer for *The Physics Teacher* (AAPT) |
| 2017-2019 | Wilkes University Technology Committee |
| 2017, 2018 | PAC-TE 2018 Fall Conference Planning Committee |
| 2017-2018 | Women Empowered by Science (WEBS) Presenter—"Exciting Exoplanets!" |
| 2016-2019 | Physics Teacher Preparation [National] Committee Member for the American Association of Physics Teachers |
| 2016 | PAC-TE 2017 Fall Conference Planning Committee |
| 2016-2019 | First Year Foundations Course Committee—Wilkes University |
| 2016-2020 | Wyoming Seminary STEM Steering Committee Member, Kingston, PA |
| 2016-2019 | STEM Education Outreach to Panamanian Teacher & Student Cohort at Wilkes University |
| January 2016 | University of Wyoming STEM Saturday |
| 2015; 2013 | Graduate Student Representative for the University of Wyoming ACGE Committee |
| January 2015 | American Astronomical Society/Astronomical Society of the Pacific Astronomy Education/Public Outreach Ambassador |
| July 2015 | University of Wyoming Literacy Summer Camp for Middle School Students |
| July 2015 | STEM Outreach for Boys and Girls Club of Rawlins, Wyoming |
| May 2015 | WiMSE Women in STEM Event |

**GRADUATE COMMITTEES**

COMMITTEE MEMBER

| Student Name | Program | University | Defense Date | Title |
|---|---|---|---|---|
| Brad Rhew | PhD in Curriculum & Instruction | Gardner-Webb University | April 2, 2024 | *The Impact of Teacher Self-efficacy Taking Online Science Method Courses* |
| Ron Ruckman | Masters of Natural Science (SMTC) | University of Wyoming | Oct. 1, 2018 | *Using Storylines to Enhance Student Understanding of Space Systems* |

**UNDERGRADUATE AND GRADUATE ADVISING**

*Wake Forest University*

- Lower Divisional Adviser
- Science Education Minor Adviser
- *Schools, Education, and Society* Minor Adviser
- Graduate Research Adviser in Elementary and Secondary Science
- Co-Graduate Student Adviser for the Education Department

*Mullen Scholar Adviser (2023-2024)*

- Advised a student research project on assessing air quality in Egypt and the United Arab Emirates.

*Goldwater Scholarship Mentor (2024-2025)*

- Mentored a student who won the Goldwater Scholarship in 2025.

*Wilkes University*

SENIOR ENGINEERING RESEARCH CO-ADVISER
Project: *Ping Pong Cannon with Magnus Force* (2017-2018)
Students: Natalie Cugini, Coletta Rempe, David Stecco, Kaitlyn Sitch.

Project: *Electric Guitar Neck Analysis and Improvements* (2017-2018)
Students: Antonio Constantino, Billy DeSmet, Tyler Johnson, Rusty Nasmit, John Pheasant.

KIRBY STEM SCHOLAR RESEARCH ADVISER (2017-2019)
Project: Determining the educational impacts of *Women Empowered by Science (WEBS) Summer Camp 2010-Present*
Student: Lauren Bezek