

Debbie A. French, PhD

Associate Professor of Science Education
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EDUCATION

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| Ph. D. | University of Wyoming
Curriculum & Instruction—Secondary Science Education
Dissertation: A three-part study focusing on pre-service teacher’s 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.
Chair: Dr. Andrea C. Burrows
Members: Drs. Hannah Jang-Condell, Ana Houseal, Victoria Gillis, Courtney McKim | August 2016 |
| M.A.T. | Miami University
Physics and Earth Science Education (7-12) | December 2004 |
| B.A. | Denison University
Individually designed major, “The Rhetoric of Physical Sciences” | May 2002 |
| A.S. | Kent State University
General Studies | May 2000 |

AWARDS AND HONORS

- 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 ITEEA’s 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
- 2013 Project Lead the Way Secondary High School Teacher of the Year, Tuscarawas County, OH
- 2013 Dr. William J. and Mae Hurst Jackson Award for Distinguished Teaching Finalist, New Philadelphia City Schools

PROFESSIONAL EXPERIENCE**HIGHER EDUCATION TEACHING EXPERIENCE***Wake Forest University**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, '24
EDU 643	Teaching Elementary STEM	Spring '20, '22, '24
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

Undergraduate Teaching Experience

FYS 100	CO2 and the Future of Earth	Fall '21, '22, '23; Spring '22
EDU 307	Instructional Design, Assessment & Technology	Fall '20, '21; Spring '23, '24
EDU 364L	Student Teaching Internship	Spring '20
EDU 365	Professional Development Seminar	Spring '20
EDU 298	Elementary Science Methods	Spring '20, '22, '23, '24
EDU 354	Science Content Pedagogy	Fall '19, '20, '22, 24
EDU 354L	Clinical Pedagogy Rounds	Fall '19, '20

*Wilkes University**Graduate Teaching Experience*

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

Undergraduate Teaching Experience

EES 280	Principles of Astronomy	Fall '18
EES280L	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, Spring '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 190	Effective Teaching with Field Experience	Fall '16
ED 180	Educational Psychology	Fall 2016, 2017, 2018

*University of Wyoming**Graduate Teaching Experience*

NASC 5120	Earth Science Global MSC	Summer 2016
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ASTR 4000	Astronomy for Teachers	Summer 2016
EDCI 5250	Advanced Topics in Pedagogy	Fall 2014, 2015
NASC 5110	Physical Science Global Perspectives	Summer 2015
EDCI 5959	STEM Integration through Guitar Fabrication in the Classroom	Summer 2015
EDCI 5550	Art and Science of Teaching	Summer 2014, 2016
<i>Undergraduate Teaching Experience</i>		
ASTR 1050	Survey of Astronomy	Fall 2015
EDSE 3275	Secondary Science Education Methods I	Fall 2014, 2015
EDSE 4500	Residency in Teaching (Student Teaching Supervision)	Fall 2014, 2015
<i>Supervised Internship</i>		
EDRE 5530	Intro to Research (on-line course) Mentor: Jennifer Weatherford	Summer 2015
<i>Graduate Teaching Assistant</i>		
EDCI 5870	Seminar: Research II	Fall 2015
EDSE 3275	Secondary Science Education Methods I	Fall 2013
EDSE 4275	Secondary Science Education Methods II	Fall 2013, 2014, 2015
EDCI 5250	Advanced Topics in Pedagogy	Fall 2013
EDRE 5550	Action Research	Fall 2013, 2014

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.** (In Review). Measuring the breaking strength of steel guitar strings. *The Physics Teacher*. #TPT24-AR-00217R.

French, D. A., Houseal, A. K., & Flarend, A. (In Review). Secondary core science teachers' perceptions of teaching climate change. *Journal of Geoscience Education*. UJGE-2023-0022.

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. A.** (In Review). A snapshot of summer STEM experiences for high school students in colleges and universities in Pennsylvania. *Journal of the Pennsylvania Academy of Science*. JPAS-D-22-00007.

- 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., Schwartz, 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.**, & Zehrunge, 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/~aschwartz/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.** 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 guitar's 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 tears 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., & Schwartz, 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 & Newton's Law of Universal Gravitation. American Association of Physics Teachers. New Orleans, LA.
- French, D. A. & Burrows, A. C.** (2016, January). Exploring NITARP's impacts on teacher's 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., Schwartz, 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 NITARP's 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 NITARP's impacts on teacher's 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
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

2023	Co-PI	Dean's 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
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	<i>The Artful Craft of Science (TACoS).</i> [Team: Burrows & Russell]	\$10,000 <i>Sigma Aldrich/UW Foundation</i> (2014-2015)	Awarded
2014	Consultant	<i>Launching Astronomy Standards and STEM Integration (LASSI).</i> [Team: Burrows & Myers]	~\$165,191 <i>DOE, WDE, MSP</i> (2014-2015)	Awarded (Grant #WY 140202)
2014	External Evaluator	<i>Science (STEM) Summer Camp in Douglas, WY</i> [Team: Burrows]	\$17,000 <i>Ellbogen Dean's Excellence Fund</i> (2014)	Awarded
2013	Travel grant recipient	<i>University of Wyoming Summer Graduate Research/Graduate Student Enhancement Grant.</i> [Team: French, D., Sanchez, R.]	\$2000 <i>University of Wyoming</i> (2013)	Awarded
2013	CoPI	<i>LEAD with GUITARS in STEM.</i> [Team: Singer, French, D., French, R., Aikens, Brown, Rabe, Hunt, Emenaker]	\$1,300,000 <i>NSF ATE DUE</i> #1304405 (2014- 2016)	Awarded
2013	External Evaluator	<i>PLACE, Year 3</i> [Team: Muir Welsh, Wachob]	\$243,530 <i>MSP Title II</i> (2014)	Awarded
2012	Consultant	<i>Collaborative Research – The Hidden Side of Rapidly Growing Black Holes: Host Masses and Evolution of Obscured Quasars with SDSS and WISE.</i> [Team: Myers & Burrows]	\$294,228 <i>NSF AST</i> (Sept 2012-Aug 2015)	Awarded (Grant #1211112)
2009	CoPI	<i>Faculty Professional Development in Design, Construction, Assembly, and Analysis of a Solid Body Guitar Design.</i> [Team: Aikens, French, D., French, R. Brown, Rabe]	\$987,000 <i>NSF ATE DUE</i> #0903336 (2010-2013)	Awarded

PROFESSIONAL AFFILIATIONS

ASTE	Association of Science Teacher Educators
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
NCS AAPT	North Carolina Section: American Association of Physics Teachers

SCIENCE RESEARCH EXPERIENCE

January 2012-	NASA/IPAC Teacher Archive Research Program (NITARP),
January 2013	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

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

PROFESSIONAL DEVELOPMENT PROVIDED

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:

2020	Electric Guitar Virtual STEM Workshop
2018	Hopkins County Career & Technology Center, Madisonville, Kentucky
2017	Grants Pass High School, Grants Pass, Oregon 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 University's 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>
 The Times Reporter, New Philadelphia, Ohio. (January 2, 2013). *Phila students head to California astronomy conference*.
<http://www.timesreporter.com/article/20130102/News/301029891>
 The Times Reporter, New Philadelphia, Ohio. (February 20, 2012). *Phila teacher helps students reach for the stars*.
<http://www.timesreporter.com/article/20120220/News/302209885>
 The Times Reporter, New Philadelphia, Ohio. (June 7, 2010). *Phila's guitar heroes*.
<http://www.timesreporter.com/article/20100607/News/306079861>

SERVICE & OUTREACH

- | | |
|---------------|--|
| 2023-Present | Wake Forest University 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 | Contemporary Issues in Teacher Education-Science Editorial Review Board |
| 2022 | 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 |
| 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 | <i>The Science of...Winston-Salem</i> 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 <i>Contemporary Issues in Technology and Teacher Education-Science</i>
2018-Present	Reviewer for the <i>Journal of Science Education and Technology (JOST)</i>
2018	AAPT Central Pennsylvania Section Vice President.
2018	AAPT Winter 2019 Conference Paper Sort
2018	Reviewer for <i>The Physics Teacher</i> (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
March 2015, 2016	Wyoming State Science Fair Judge

GRADUATE COMMITTEES

COMMITTEE MEMBER

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

UNDERGRADUATE AND GRADUATE ADVISING

Wake Forest University

- Lower Divisional Adviser to...
 - 10 advisees (Fall 2020-Spring 2021)

- 16 advisees (Fall 2022)
- Science Education Adviser to three students (2019-2020), and one student (2020-2021)
- *Schools, Education, and Society* Minor Adviser to seven students in 2023
- Graduate Research Adviser in Elementary and Secondary Science to...
 - One elementary grad student 2020-2021
 - One elementary grad student 2021-2022
 - Two secondary graduate students 2023-2024

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