

**VITA**  
**JENNIFER ANNE WILHELM**

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Professor of STEM Education  
Chair of STEM Education Department  
College of Education  
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University of Kentucky  
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**Academic Degrees and Preparation**

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University of Texas at Austin	Science/Math Education	Ph.D. 2002
	Advisor: Jere Confrey	
	<i>Dissertation: Assessing student understanding of sound waves and trigonometric reasoning in a technology-rich, project-enhanced environment</i>	
Austin, Texas	Secondary Mathematics	Teaching Certificate 1998
Michigan State University	Physics	M.S. 1991
Argonne National Laboratory	Student Researcher/Raman Spectroscopy	1987-1988
Bowling Green State University	Major: Physics, Minor: Mathematics	B.S. 1988

**Professional Experience**

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2014 – Present	University of Kentucky	Tenured Full Professor; Dept. Chair of STEM Education
2011 – 2014	University of Kentucky	Department Chair of STEM Education; Associate Professor, Tenured
2009 – present	University of Kentucky	Associate Professor, Tenured
2008 – 2009	Texas Tech University, Lubbock, Texas	Associate Professor, Tenured
2007 – 2009	Texas Tech University, Lubbock, Texas	Science & Mathematics

		Program Coordinator
2002 – 2008	Texas Tech University, Lubbock, Texas	Assistant Professor
1998 – 2002	University of Texas, Austin, Texas	Graduate Research Assistant
1997 – 1998	Travis High School, Austin, Texas	Physics/Calculus Teacher
1997 – 1998	Austin Community College, Austin, Texas	Physics Instructor
1992 – 1996	Lansing Community College, Lansing, Michigan	Physics Instructor

## **Honors and Awards**

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- University Research Professor (2018-2019) for College of Education at the University of Kentucky
- University of Kentucky Faculty Mentor of the Week (2018)
- University of Kentucky Teacher Who Made a Difference (2016)
- Recipient of Texas Tech University President’s Academic Achievement Award (2009)
- Recipient of Texas Tech Ex-Student Association Alumni New Faculty Award (Texas Tech College of Education and Texas Tech University, 2006)
- Who’s Who in America (2008)
- Nominated for the Hemphill-Wells New Professor Excellence in Teaching Award (2005)
- Nominated for the Barnie E. Rushing, Jr. Faculty Distinguished Research Award (2007 and 2008)
- Nominated for Chancellor’s Council Distinguished Research Award (2008)

## **Scholarship**

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### **Funded Grants - Totaling \$9,879,190**

**\$1,200,000** – Mohr-Schroeder (PI), **Wilhelm, J. (Co-PI)**, Criswell, B. (Co-PI), Testa, S. (Co-PI), Walcott, B. (Co-PI). (2018 - 2023). UK Noyce STEM PLUS: Producing Leaders for Urban/rUral Schools. National Science Foundation.

**\$360,656** – Fisher, M. (PI), **Wilhelm, J. (Co-PI)**. (2016 – 2019). *REU Site: STEM CATS: Creating Academic Teacher Scholars in STEM Education*, National Science Foundation.

**\$271,491 - Wilhelm, J. (PI)**, Wilhelm, R. (Co-PI), Guiton, B. (Co-PI), and Coleman, C. (Co-PI). (January 2015 – June 2017). *Designing Mathematics and Science Project-Based Environments: Spanning Astronomical and Atomic Spaces*, Kentucky Council of Postsecondary Education.

**\$260,000** – Krall, R. (PI), **Co-PIs: Wilhelm, J.**, Hanley, C., Henry, L., and Proffitt, E. (2013 – 2016). *Project-Based Investigations on Improving Water Quality in the Kentucky River*, Kentucky Council on Postsecondary Education.

**\$316,494** – Fisher, M., (PI), **Wilhelm, J. (Co-PI)**, Bouwma-Gearhart, J (Co-PI), Senior Personnel: Jackson, C., Jong, C., Krall, R., Mohr-Schroeder, M. (2012 – 2015). *REU Site: Supporting Undergraduate Research Fellows in Timely STEM Education Research Via the University of Kentucky's STEM Education Research Laboratory*. National Science Foundation.

**\$499,794** – **Wilhelm, J. (PI)**. (2012 – 2017). *Partnership Enhancement Model for P-16 Mathematics and Science Education*. Toyota USA Foundation.

**\$800,000** – Mohr-Schroeder, M. (PI), **Wilhelm, J. (Co-PI)**, Walcott, B. (Co-PI), Royster, D. (Co-PI), and Testa, S. (Co-PI). (2012 – 2017). *UK NOYCE: New Opportunities Yielding Classroom Excellence, Phase II*. National Science Foundation.

**\$8,200** – **Wilhelm, J. (PI)**, Wilhelm, R., Jackson, C. (December 2013 – December 2014). *Students Understanding Research in Realistic Explorations in Astronomical Learning (SURREAL) Project*. Mentors & Meals.

**\$10,101** – **Wilhelm, J. (PI)**, Jackson, C., & Wilhelm, R. (January 2013 – December 2013). *Research to Compare Informal and Formal Environments Towards Understanding How Middle Level Students Learn Math and Science: A Realistic Explorations in Astronomical Learning Project*. NASA Kentucky Space Grant Consortium.

**\$7,000** – **Wilhelm, J. (PI)** & Jackson, C. (December 2012 – July 2013). *Informal STEM Learning the REAL Way*. Mentors & Meals.

**\$335,000** – Zeidler-Watters, K. (PI), Cooper, R. (Co-PI), & **Wilhelm, J. (Co-PI)**. (January 2013 – September 30, 2014). *Modeling for Understanding in Science and Engineering*. Kentucky Department of Education Mathematics and Science Partnership Award.

**\$10,101** – **Wilhelm, J. (PI)**, Wilhelm, R., & Jackson, C. (January 2012 – December 2012). *Researching Equity in STEM Classrooms as Middle Level Students Experience the NASA-based Realistic Explorations in Astronomical Learning Curriculum*. NASA Kentucky Space Grant Consortium.

**\$3,000,000** – **Wilhelm, J. (PI)**, Aguirre-Munoz, Z., Casadonte, D., Dwyer, J., Baker, M., McGinley, M., and Lamp, D. (2008-2009). *Middle School Math and Science (MS)<sup>2</sup>: Understanding by Design*. Greater Texas Foundation.

**\$2,723,642** – Casadonte, D. (PI), **Wilhelm, J. (Co-PI)**, Dwyer, J., Baker, M., and Perry, K. (2008-2009). *NSF GK-12 Building Bridges: Integrating Mathematics, Science, and Engineering Education on the South Plains*. National Science Foundation.

**\$44,001** – **Wilhelm, J. (PI)** and Wilhelm, R. (2006-2008), *Cratering Analysis for REAL: Investigating Craters in the Solar System*. NASA – IDEAS AWARD.

**\$1,400** – **Wilhelm, J. (PI)** and Wilhelm, R. (2005). *Bridging Mathematical and Scientific Understandings using a Lunar Context*. College of Education Research Award.

**\$25,000** – McMillan, S. (PI) and **Wilhelm, J. (Co-PI)**. (2003-2005). *Moon Journals: Students Forging New Mathematical and Literacy Identities*. AERA/IES Research Award.

**\$2,000** – **Wilhelm, J. (PI)** and McMillan, S. (2003). *Interdisciplinary Projects and Narratives: Building Diverse Pathways to Success*. College of Education Research Award.

**\$4,310** – **Wilhelm, J.** and McMillan, S. (2002). *Moon Studies and Other Environmental Investigations: Students Forging New Literacy and Mathematical Identities*. Faculty Course Release Texas Tech University.

### **Pending Research Grant Proposals (\$4,458,435)**

**\$2,958,557** – **Wilhelm, J. (PI)**, Fisher, M. (Co-PI), Criswell, B. (Co-PI), Guiton, B. (Co-PI), Wilhelm, R. (Co-PI), Amick, L. (SP), Osterhage, J. (SP), Mohr-Schroeder, M. (SP), Lumppp. J. (SP), and Hinds, S. (SP). *K-TIES: Kentucky Teachers Improving Education in STEM*. Submitted to the National Science Foundation 8/27/2018.

**\$1,499,878** – **Wilhelm, J. (PI)**, Wilhelm, R. (Co-PI). *Collaborative Research: Teachers Engineering Project-based STEM Environments to Impact Diverse Learning Groups: Spanning Astronomical and Mathematical Spaces (Project SAMS)*. Submitted to the National Science Foundation 11/13/2018.

### **Unfunded Research Grant Proposals**

**\$450,000** – She, X., **Wilhelm, J.**, and Chang, L. (submitted December, 2016). *Collaborative Research: Promoting K-5 Mathematics Instructional Effectiveness: A Content-Based, Evidence-Driven Professional Development Program Aligned with CCSS-M*. National Science Foundation

**\$130,000** – **Wilhelm, J.** and Wilhelm, R. (submitted January 2017). *Three-Dimensional Project-Based Instruction: Using Trigonometry and Waves in a Technology Rich Environment to Complete the Mathematics, Science, Career and Technical Education Triad*. Submitted to Kentucky Council of Postsecondary Education.

**\$3,000,000** – Grulke, E. (PI), Co-PIs: **Wilhelm, J.**, Moseley, H., Farman, M., and Stromberg, A. (Submitted June 2014). NRT-DESE: ‘Omics’ Integration as a Tool to Accelerate Bioinformatics Research and Innovation, National Science Foundation.

**\$450,000** – **Wilhelm, J., (PI)**, Co-PIs: Wilhelm, R., Toland, M., and Jackson, C. (**Submitted 12/5/2013**). *Evaluating Middle School Students’ Spatial-Scientific Performance in Earth-Space Science: A Realistic Explorations in Astronomical Learning Project*, (DRK-12), National Science Foundation.

**\$500,000** – **Wilhelm, J. (PI)**, Fisher, M., Jackson, C., Mohr-Schroeder, M. & Wilhelm, R. (**Submitted 12/14/2012**). *Teachers Experience Project-based STEM: Curriculum, Research, and Networks*. National Aeronautics and Space Administration. (not funded)

**\$6,141,184** – Mohr-Schroeder, M., (PI), **Co-PIs: Wilhelm, J.**, Walcott, B., Feese, N. & Lee, C. (**Submitted 12/18/2012**). *STEM PLUS: Producing Leaders for rUral/sUburban/Urban Schools*. National Science Foundation. (not funded)

**\$1,999,756** – Wilhelm, R. (PI), **Co-PIs: Wilhelm, J.**, Duncan, C., Lester, T., & Royster, D. (Submitted 12/10/2012). *Systemic Teaching and Research Engagement in Applied Mathematical Sciences: A Rural Recruitment and Retention Initiative*. National Science Foundation. (not funded)

**\$200,000** – **Wilhelm, J. (PI)** and Wilhelm, R. (Submitted 5/26/2011). *Virtually-enhanced Project-based Realistic Explorations in Astronomical Learning*. National Science Foundation. (not funded)

**\$1,999,991** – Hanley, C.(PI), **Co-PIs: Wilhelm, J.**, Dinoto, V., and McMichael, C. (Submitted 5/13/2011). *Scaling Up Community-Based Investigations through Geospatial Technologies and Career Internships: A GeoSTEM Consortium*. National Science Foundation. (not funded)

**\$2,099,829** – Royster, D. (PI), **Co-PIs: Wilhelm, J.**, Strunk, K., Lee, C., and Schroeder, M. (Submitted 7/8/2010). *Testing the Effectiveness of the AMSP Professional Development Model and its Application to Professional Development for Mathematics Teachers*. National Science Foundation. (not funded)

**\$1,153,328** – **Wilhelm, J. (PI)**, Jackson, C., Jiang, Y., Curtis, W.J., Hruby, G., Wilhelm, R., and Cowen, J. (Submitted 11/15/2010). *Researching Spatial Development by Gender via ERP and fMRI Measures Pre and Post Pedagogical Intervention*. National Science Foundation. (not funded)

**\$4,059,805** – Osborn, J. (PI), **Co-PIs: Wilhelm, J.**, Schnittka, C., Straley, J., and Cowen, J. (Submitted 1/7/2010). *Newton's Universe: Scale Up and Expansion of Middle School Teacher and Student Understanding of Physical Science*. National Science Foundation. (not funded)

### **Book Publications**

**Wilhelm, J.**, Wilhelm, R., and Cole, M. (**in press**). *Creating Project-Based STEM Environments: The REAL Way*. Springer International Publishing AG Gewerbstrasse 11, 6330 Cham, Switzerland.

Schack, E., Fisher, M., and **Wilhelm, J.** (Eds.) (2017). *Teacher Noticing: Bridging and Broadening Perspectives, Contexts, and Frameworks*. Springer.  
<http://www.springer.com/us/book/9783319467528>

### **Publications (Refereed Journal Articles)**

\* indicates doctoral students included in research

**Wilhelm, J.**, Cole, M., Cohen, C., & Lindell, R. (2018). How middle level science teachers visualize and translate motion, scale, and geometric space of the Earth-Mon-Sun system with their students. *Physical Review Physics Education Research*, 14, 010150.

- \*Lamar, M., **Wilhelm, J.**, & Cole, M. (2018). A mixed methods comparison of teachers' lunar modeling lesson implementation and student learning outcomes. *The Journal of Educational Research*, 111(1), 108-123.
- Cole, M., Cohen, C., **Wilhelm, J.**, & Lindell, R. (2018). Spatial thinking in astronomy education research. *Physical Review Physics Education Research*, 14, 010139.
- \*Driessen, E., Dunn, A., Sallah, K., **Wilhelm, J.**, & Cole, M. (2018). A qualitative study of baseline urban and rural middle level science teacher and student views on engineers and engineering. *International Journal of Environmental & Science Education*, 13(7), 559-578.
- \***Wilhelm, J.**, Toland, M., & Cole, M. (2017). Evaluating middle school students' spatial-scientific performance within Earth/space astronomy in terms of gender and race/ethnicity. *Journal of Education in Science, Environment and Health (JESEH)*, 3(1), p. 40-51.
- \*Cole, M., **Wilhelm, J.**, Guido, B., & Yates, H. (under review). Middle School Students' Chemistry Content Knowledge and Spatial Reasoning Ability. *Journal of Chemical Education*.
- \***Wilhelm, J.**, Cameron, S., Cole, M., Pardee, R. (2015). Using Professional Noticing to Address Middle Level Students Alternative Conceptions of Lunar Phases. *Science Scope*, 39(1), p. 32-44.
- \*Jackson, C., **Wilhelm, J.**, Lamar, M., & Cole, M. (2015). Gender and Racial Differences: Development of Sixth Grade Students' Geometric Spatial Visualization within an Earth/Space Unit. *School Science and Mathematics*, 115(7), 330-343.
- \*Cole, M., **Wilhelm, J.**, and Yang, H. (2015). Student moon observations and spatial-scientific reasoning. *International Journal of Science Education*, 37(11-12), p. 1815-1833.
- Wilhelm, J. (2014a)**. Project-based instruction with future STEM educators: An interdisciplinary approach. *Journal of College Science Teaching*, 43(4), p. 60-70.
- Wilhelm, J. (2014b)**. Young children do not hold the classic Earth's shadow misconception to explain lunar phases. *School Science and Mathematics*, 114(7), p. 349-363.
- She, X., Matteson, S., Siwatu, K. O., **Wilhelm, J. (2014)**. Exploring Preservice Teachers' Conceptual Understanding of Algebraic Ideas: Linear Function and Slope. *International Journal of Education and Social Science*, 1(5), 90-101. [www.ijessnet.com](http://www.ijessnet.com)
- \***Wilhelm, J.**, Jackson, C., Sullivan, A., and Wilhelm, R. (2013). Examining differences between pre-teen groups' spatial-scientific understandings: A quasi-experimental study. *The Journal of Educational Research*, 106(5), p. 337-351. DOI:10.1080/00220671.2012.753858.
- \***Wilhelm, J.**, Matteson, S., and She, X. (2013). Investigating preservice teachers' understanding of balance concepts utilizing a clinical interview method and a virtual tool. *International*

- Journal of Science and Mathematics Education*, 11(6), p. 1209-1231.
- Venville, G., Louisell, R., and **Wilhelm, J. (2012)**. A complex dynamic systems view of young children's knowledge about the moon. *Research in Science Education*. 42(4), p. 729-752.
- \*Stout, T., Dwyer, J., Byerly, R., and **Wilhelm, J. (2011)**. Assessing the Learning of Proofs in High School. *International Journal for Mathematics Teaching and Learning*. Available online at <http://www.cimt.plymouth.ac.uk/journal/dwyer3.pdf>.
- \***Wilhelm, J.**, She, X., and Clem, D. (2011). Differences in Math and Science Understanding between NSF GK-12 Participant Groups: A Year Long Study. *Journal of STEM Education: Innovations and Research*, 12(1), p. 55-68.
- \*She, X., Lan, W., and **Wilhelm, J. (2011)**. A comparative study on pedagogical content knowledge of mathematics teachers in China and the U.S. *New Waves-Educational Research & Development*, 14(1).
- \*Valles, J., She, X., **Wilhelm, J.**, and Casadonte, D. (2011). Dominant factors of self-efficacy and motivation of low performing minority high school students. *National FORUM of Special Education Journal*, 8(2), p. 6-20.
- Matteson, S. and **Wilhelm, J. (2011)**. Hanging in the Balance. *Mathematics Teaching in the Middle School*. 17(1), p. 56-60.
- Wilhelm, J. (2009)**. Gender differences in lunar-related scientific and mathematical understandings. *International Journal of Science Education*, 31(15), p. 2105-2122.
- Wilhelm, J. (2009)**. A case study of three children's original interpretations of the moon's changing appearance. *School Science and Mathematics*, 109(5), p. 258-273.
- \*Sherrod, S. and **Wilhelm, J. (2009)**. A study of how classroom dialogue facilitates the development of geometric spatial concepts related to understanding the cause of moon phases. *International Journal of Science Education*, 31(7), p. 873-894.
- \*Ganesh, B., **Wilhelm, J.**, and Sherrod, S. (2009). Development of a geometric spatial visualization tool. *School Science and Mathematics*. 109(8), p. 461-472.
- \***Wilhelm, J.**, Sherrod, S., and Walters, K. (2008). Project-based learning environments: Challenging pre-service teachers to act in the moment. *The Journal of Educational Research*, 101(4), p. 220-233.
- \*Duke, B., Dwyer, J., **Wilhelm, J.**, and Moskal, B. (2008). Complex variables in junior high school: The role and potential impact of an outreach mathematician. *Teaching Mathematics and its Applications*, 27(1), p. 38-47.  
<http://teamat.oxfordjournals.org/papbyrecent.dtl>
- \***Wilhelm, J.**, Smith, W., Walters, K., Sherrod, S., and Mulholland, J. (2008). Engaging pre-service teachers in multinational, multi-campus scientific and mathematical inquiry. *International Journal of Science and Mathematics Education*, 6(1), p. 131-162.

- Wilhelm, J.,** Thacker, B., and Wilhelm, R. (2007). Creating Constructivist Physics for Introductory University Classes. *Electronic Journal of Science Education*, 11(2), p. 19-37.
- McMillan, S. and **Wilhelm, J.** (2007). Students' stories: Adolescents constructing multiple literacies through nature journaling. *Journal of Adolescent and Adult Literacy*, 50(5), p. 370-377.
- \*Dwyer, J., Duke, B., Moskal, B., and **Wilhelm, J.** (2007). Complex Variables in Secondary School. *Mathematics Teaching Incorporating Micromath*, 201, (March, 2007), p. 32-34.
- \***Wilhelm, J.** and Walters, K. (2007). Creating interdisciplinary lunar liaisons. *The Hoosier Science Teacher*, 32(4), p. 143-148.
- \***Wilhelm, J.** and Walters, K. (2006). Pre-service mathematics teachers become full participants in inquiry investigations, *International Journal of Mathematical Education in Science and Technology*, 37(7), p. 793-804.
- \***Wilhelm, J.,** McMillan, S., Walters, K. and Lovering, E. (March, 2006). Phasing in lunar observations. *Science Scope*, p. 64-66.
- Wilhelm, J.** and Confrey, J. (2005). Designing project-enhanced environments: Students investigate waves and sound. *The Science Teacher*, 72(9): 42-45.
- Castro-Filho, J., **Wilhelm, J.,** and Confrey, J. (May, 2005). Understanding rate of change using motion detectors: One teacher's voice, perspective, and growth. *International Journal for Mathematics Teaching and Learning*.  
<http://www.cimt.plymouth.ac.uk/journal/default.htm>.
- Wilhelm, R. and **Wilhelm, J.** (March, 2004). Water and life on mars: Exploring the possibilities through an Astronomy Laboratory. *Journal of College Science Teaching*. 33(5), (p. 41-44).
- Wilhelm, J.** and McMillan, S. (2004). Moon investigations: Students forging new literacy and scientific-mathematical identities. *Electronic Journal of Literacy through Science*. 3(1).  
<http://ejlts.ucdavis.edu/archive>.
- Wilhelm, J.A.,** and Confrey, J. (2003). Projecting rate of change in the context of motion onto the context of money. *International Journal of Mathematical Education in Science and Technology*, Taylor & Francis Ltd. Oxfordshire, UK. 34(6), (p. 887 – 904).
- Confrey, J. Castro-Filho, J. and **Wilhelm, J.** (2000). Implementation research as a means to link systemic reform and applied psychology in mathematics education. In Ron Marx (Eds.) Special issue of *Educational Psychologist*, 35(3), (p. 179-191).



## Refereed Book Chapters

\* indicates doctoral students included in research

- Wilhelm, J. & Fisher, M. (in press).** Preparing STEM teachers as researchers: A research experiences for undergraduates project. In Doig, B., & Williams, J. (Eds.) *Interdisciplinarity: A Glass Half Full*. Springer.
- \***Wilhelm, J.,** Cole, M., Pardee, R., and Cameron, S. (2015). Mathematical classroom discourse in three middle level science classrooms. In Bartell, T. G., Bieda, K. N., Putnam, R. T., Bradfield, K., & Dominguez, H. (Eds.) *Proceedings of the 35th Annual Meeting of the North American Chapter of the International Group for the Psychology of Mathematics Education*, (p. 1162). East Lansing, MI: Michigan State University: PME.
- Mohr-Schroeder, M. J, Jackson, C., Schroeder, D. C., and **Wilhelm, J.** (in press). Developing a STEM Education teacher preparation program to help increase STEM Literacy amongst preservice teachers. In P. Jenlink (Ed.), *STEM teaching and Common Core Standards: An interdisciplinary approach*. Lanham, Maryland: Rowman & Littlefield.
- \***Wilhelm, J.,** Jackson, C., & Cole, M. (2014). STEM Education in Formal and Informal Environments: The REAL Way. In Liljedahl, P., Nicol, C., Oesterle, S., & Allan, D. (Eds.). *Proceedings of the 38<sup>th</sup> Conference of the International Group for the Psychology of Mathematics Education and the 36<sup>th</sup> Conference of the North American Chapter of the Psychology of Mathematics Education (Vol. 6, p. 412)*. Vancouver, Canada: PME.
- \*Cole, M., **Wilhelm, J.,** Jackson, C., and Yang, H. (2013). Exploring the relationships between student moon observations and spatial-scientific reasoning. *Proceedings of the Thirty-fifth Annual Meeting of the North American Chapter of the International Group for the Psychology of Mathematics Education*, PME-NA – Chicago, IL, (November 14-17, 2013).
- \*Russey, C., **Wilhelm, J.,** and Jackson, C. (2013). Middle school students' mathematical comprehension of latitude and longitude. *Proceedings of the Thirty-fifth Annual Meeting of the North American Chapter of the International Group for the Psychology of Mathematics Education*, PME-NA – Chicago, IL, (November 14-17, 2013).
- \*Jackson, C., **Wilhelm, J.,** and Peake, J. (2013). Gender Differences: Examining Sixth Grade Students' Understanding of Geometric Spatial Visualization. *Proceedings of the Thirty-fifth Annual Meeting of the North American Chapter of the International Group for the Psychology of Mathematics Education*, PME-NA – Chicago, IL, (November 14-17, 2013).
- \***Wilhelm, J.,** Jackson, C. D., Sullivan, A., and Wilhelm, R. (2012). Factors influencing middle school students' spatial mathematics development while participating in an integrated STEM unit. In L. R. Van Zoest, J. J. Lo, and J. L. Kratky (Eds.) *Proceedings of the Thirty-fourth Annual Meeting of the North American Chapter of the International Group for the Psychology of Mathematics Education*. (PME-NA– Kalamazoo, MI), p. 311-318.

- \*Jackson, C. D., **Wilhelm, J.**, Sullivan, A., Wilhelm, R. J. (2012). Gender differences of high and low performing students' spatial reasoning. In L. R. Van Zoest, J. J. Lo, and J. L. Kratky (Eds.) *Proceedings of the Thirty-fourth Annual Meeting of the North American Chapter of the International Group for the Psychology of Mathematics Education*. (PME-NA– Kalamazoo, MI), p. 1041.
- Wilhelm, J. (2011)**. Spatial mathematics learning through implementation of a technology-rich, project-based unit with 21st century educators. In L. R. Wiest, & T. Lamberg (Eds.) *Proceedings of the Thirty-third Annual Meeting of the North American Chapter of the International Group for the Psychology of Mathematics Education*. (PME-NA – Reno, Nevada), p. 1786 – 1793.
- \***Wilhelm, J.**, Matteson, S., and She, X. (2010). Assessing how pre-service teachers understand balance through clinical interviews and a virtual tool. In P. Brosnan, Erchick, D., & Flevaris, L. (Eds.) *Proceedings of the Thirty-second Annual Meeting of the North American Chapter of the International Group for the Psychology of Mathematics Education*. (PME-NA – Columbus, Ohio). Vol. VI, p. 1030 – 1038.
- Berg, J., Holtz, M., Yu, S., Bunuan, R., **Wilhelm, J.**, Dallas, T., Gale, R., Gollahon, L., Gangopadhyay, S., and Temkin, H. (2004). Towards integrating graduate research and education with ‘internal research internships’: Experiences and assessment. In W. Aung et al. (Eds.) *Innovations 2004: World Innovations in Engineering Education and Research*. (BEGELL House Publishing, Arlington, VA), p. 291-302.
- Wilhelm, J.**, Cooper, S., and McMillan, S. (2004). Pre-service teachers experiencing mathematics through moon projects and spinning tops. In D. McDougall and J. Ross (Eds.) *Proceedings of the 26<sup>th</sup> Annual Meeting of the North American Chapter of the International Group for the Psychology of Mathematics Education*. Toronto: OISE/UT. Vol 3, p. 1167-1174.
- Wilhelm, J.** and Confrey, J. (2002). Students understanding of sound waves and trigonometric reasoning in a project-enhanced environment. In D. Mewborn, P. Sztajn, D. White, H. Wiegel, R. Bryant, and K. Nooney (Eds.) *Proceedings of the Twenty-fourth Annual Meeting of the North American Chapter of the International Group for the Psychology of Mathematics Education*. Vol. 2, p. 1067.
- Castro-Filho, J., **Wilhelm, J.**, and Confrey, J. (1999). Motion detectors in the school: Teachers making sense of rate of change and motion. In F.Hitt and M.Santos (Eds.) *Proceedings of the Twenty-First Annual Meeting of the North American Chapter of the International Group for the Psychology of Mathematics Education*. Vol. 2, p. 703-708.
- Wilhelm, J.**, Confrey, J., Castro-Filho, J., and Maloney, A. (1999). Interactive diagrams to address key student conceptions in mathematics. In D. Thomas (Eds.) *International Conference on M/Set 99 Mathematics/Science Education & Technology*. Charlottesville, VA. Association for the Advancement of Computing in Education, p. 231-236.
- Castro-Filho, J., Confrey, J., **Wilhelm, J.**, and Meletiou, M. (1999). Using interactive diagrams

as a means to promote deeper content knowledge by students and teachers. In D. Thomas (Eds.) *International Conference on M/Set 99 Mathematics/Science Education & Technology*. Charlottesville, VA. Association for the Advancement of Computing in Education, p. 222-226.

## **Reports**

Wilson, S., Martin, G., Martin-Hansen, L., Pugalee, D., Webb, D., & **Wilhelm, J. (2012)**. The common core state standards and teacher preparation: The role of higher education. *Discussion paper for the Science and Mathematics Teacher Imperative (SMTI)/The Leadership Collaborative (TLC)* – Working Group on Common Core State Standards.

## **Refereed International, National, and Regional Paper Presentations**

\* indicates doctoral students included in research

Fisher, M.H., **Wilhelm, J. (November 2018)**. A Research Experiences for Undergraduates Program: Preparing Future Researchers in STEM Education. *Poster presented at the North American Chapter of the Psychology of Mathematics Education*. Greenville, SC.

**Wilhelm, J. & Fisher, M. (2018)**. Fostering pre-service teachers' undergraduate success: An REU program in STEM education. *Paper presented at the annual meeting of the American Educational Research Association, AERA* – New York, NY (April 13 – 17, 2018).

\*Curry, K., **Wilhelm, J.**, Cole, M., & Yang, H. (2018). Using student characteristics/spatial-content knowledge and teacher spatial-content knowledge to predict lunar understanding. *Paper presented at the annual meeting of the American Educational Research Association, AERA* – New York, NY (April 13 – 17, 2018).

Cole, M. & **Wilhelm, J. (2018)**. Middle school science teachers' mental rotation ability, chemistry content knowledge, and misconceptions. *Paper presented at the annual meeting of the American Educational Research Association, AERA* – New York, NY (April 13 – 17, 2018).

Cole, M., **Wilhelm, J.** Fish, H., & Fish, C. (2018). Middle school students' spatial thinking and understanding of the conservation of matter. *Paper presented at the annual meeting of the National Association for Research in Science Teaching, NARST* – Atlanta, GA (March 10-13, 2018).

**Wilhelm, J.**, Fisher, M.H. (August 2017). Preparing Preservice Teachers as Researchers: An REU Experience in STEM Education. *European Science Education Research Association Conference*. Dublin, Ireland.

Cole, M., & **Wilhelm, J. (2017)**. Middle School Teachers' Spatial Ability and Understanding of Chemistry. *Presentation at the annual meeting of the School Science and Mathematics Association, SSMA* – Lexington, KY (November 2-4, 2017).

- \***Wilhelm, J.** & Cole, M. (2017). Evaluating Middle School Students' Spatial-Scientific Performance within Earth/Space Astronomy. *Paper presented at the annual meeting of the American Educational Research Association, AERA* – San Antonio, TX (April, 2017).
- \*Cole, M. & **Wilhelm, J.** (2017). Linking Middle School Students' Chemistry Content Knowledge and Spatial Reasoning. *Paper presented at the annual meeting of the National Association for Research in Science Teaching, NARST* – San Antonio, TX (April, 2017).
- \*Cole, M. & **Wilhelm, J.** (2016). Partnership Enhancement Projects: Creating Teacher Leaders in Science Education. *Presented at the area conference of National Science Teachers Association, NSTA* – Columbus, OH (December 1-3, 2016).
- \***Wilhelm, J.** & Cole, M. (2016). How middle level inservice mathematics and science teachers visualize motion, space, and scale. *Paper presented at the Thirty - Eighth Annual Meeting of the North American Chapter of the International Group for the Psychology of Mathematics Education, PME – NA.* Tucson, AZ (November 3-6, 2016)
- \*Cole, M. & **Wilhelm, J.** (2016). Developing Mathematics Teacher Leaders Through a Partnership Enhancement Project. *Paper presented at the Thirty - Eighth Annual Meeting of the North American Chapter of the International Group for the Psychology of Mathematics Education, PME – NA.* Tucson, AZ (November 3-6, 2016)
- \*Cole, M., **Wilhelm, J.**, Guido, B., & Yates, H. (2016) Middle School Students' Spatial Reasoning and Understanding of Matter. *Paper presented at the annual convention of the School Science and Mathematics Association, SSMA* – Phoenix, AZ (October 20-22, 2016)
- \*Cole, M. & **Wilhelm, J.** (2016). Middle School Teachers' Alternative Conceptions of Chemistry Concepts. *Presentation at the Biennial Conference on Chemical Education, BCCE* – Greeley, CO (July 31 – August 4, 2016).
- Wilhelm, J.** & Fisher, M. (2016). Preparing STEM teachers as researchers: A research experiences for undergraduates project. *Paper presented at the 13<sup>th</sup> International Congress on Mathematical Education (ICME).* (July 2016, Hamburg, Germany).
- Mohr-Schoeder, M. & **Wilhelm, J.** (2016). Modeling for understanding with NOYCE fellows. *Paper presented at the 13<sup>th</sup> International Congress on Mathematical Education (ICME).* (July 2016, Hamburg, Germany).
- \***Wilhelm, J.**, & Cole, M. (2016). Teachers' conceptions and spatial sense about the Earth, Moon, Sun system. *Paper presented at the annual meeting of the National Association for Research in Science Teaching, NARST* – Baltimore, MD (April 14-17, 2016).
- \*Cole, M., & **Wilhelm, J.** (2016). Using Moon journals to show inservice teachers' spatial reasoning of lunar phases. *Paper presented at the annual meeting of the National Association for Research in Science Teaching, NARST* – Baltimore, MD (April 14-17,

2016).

- \***Wilhelm, J., & Cole, M. (2016).** In-service teachers' alternative conceptions of lunar-related concepts. *Presentation at the annual meeting of the American Educational Research Association, AERA – Washington, DC (April 8-12, 2016).*
- LeVaughn, J. M., McNall Krall, R., Kumar, B. S., **Wilhelm, J., Hanley, C. D., (2016).** From professional development to teacher practice: Project-based investigations of local watersheds, *Presented at the annual meeting of the National Association for Research in Science Teaching, NARST – Baltimore, MD (April 14-17, 2016).*
- \*Cole, M., **Wilhelm, J., Aurelius, V., & Moorhead, L. (2015).** Designing mathematics and science project-based environments: Spanning astronomical and atomic Spaces (SAAS). *Presentation at the area conference of National Science Teachers Association. NSTA – Philadelphia, PA (November 12-14, 2015).*
- \*Aurelius, V., Moorhead, L., **Wilhelm, J., & Cole, M. (2015).** Two middle school teachers' experiences in adapting and implementing an integrated mathematics–science curriculum. *Presentation at the area conference of National Science Teachers Association. NSTA – Philadelphia, PA (November 12-14, 2015).*
- \***Wilhelm, J., Cole, M., Pardee, R., and Cameron, S. (2015).** Mathematical classroom discourse in three middle level science classrooms. *Paper presented at the Thirty - seventh Annual Meeting of the North American Chapter of the International Group for the Psychology of Mathematics Education, PME – NA. East Lansing, MI: Michigan State University. (November, 2015).*
- \***Wilhelm, J., & Cole, M. (2015).** Spanning astronomical and atomic spaces in middle school classrooms through project-based instruction. *Presentation at the annual convention of the School Science and Mathematics Association. SSMA – Oklahoma City, OK (October 29-31, 2015).*
- \*Cole, M., **Wilhelm, J., & Zeidler, K. (2015).** Teachers' understanding and implementation of project-based instruction in high school science classrooms. *Presentation at the annual convention of the School Science and Mathematics Association. SSMA – Oklahoma City, OK (October 29-31, 2015).*
- Fisher, M. H., & **Wilhelm, J. (2015).** STEM education research experiences for undergraduates: Preparing teachers as researchers. *Paper presented at the European Science Education Research Association (ESERA) Conference – Helsinki, Finland (September, 2015).*
- McNall Krall, R., **Wilhelm, J. (2015).** Developing middle school science teachers' expertise in creating project-based investigations on watersheds. *Paper presented at the European Science Education Research Association (ESERA) Conference – Helsinki, Finland (September, 2015).*
- \*Lamar, M., **Wilhelm, J., & Cole, M. (2015).** How well does an observation protocol predict student achievement? *Paper presented at the annual meeting of the American*

*Educational Research Association, AERA (Chicago, IL).*

- \*Lamar, M., **Wilhelm, J.**, & Cole, M. (2015). Comparing teachers' implementation of a lunar modeling lesson using a modified P-SOP instrument. *Paper presented at the annual meeting of the National Association for Research in Science Teaching, NARST (Chicago, IL).*
- Thomas, J., Jong, C., Schack, E. O., Fisher, M. H., **Wilhelm, J.**, Stockero, S. (2015). Teacher noticing: A hidden skill of teaching. *Presented at the Thirty - seventh Annual Meeting of the North American Chapter of the International Group for the Psychology of Mathematics Education, PME – NA. East Lansing, MI: Michigan State University. (November, 2015).*
- \*Bean, W., Peake, J., **Wilhelm, J.**, & Jackson, C. (2014). Impact of student motivation on learning mathematics in an informal setting. *Paper presented at School Science and Mathematics Association Convention. Jacksonville, FL.*
- \*Cole, M., & **Wilhelm, J.** (2014). Active participation through partnership enhancement projects: Science and mathematics education reform. *Paper presented at School Science and Mathematics Association Convention. Jacksonville, FL.*
- \*Fisher, M. H., & **Wilhelm, J.** (2014). Examining REU fellows' research expectations as they begin a research-intensive STEM program. *Paper presented at School Science and Mathematics Association Convention. Jacksonville, FL.*
- \***Wilhelm, J.**, Lamar, M., & Cole, M. (2014). Correlating teachers' implementation of a Moon phase lesson to student learning outcomes. *Paper presented at School Science and Mathematics Association Convention. Jacksonville, FL.*
- \***Wilhelm, J.** & Cole, M. (2014). STEM education in formal and informal environments: The REAL Way. *Paper presented at the Joint Meeting of the International Group for the Psychology of Mathematics Education (PME 38) and the North American Chapter of the Psychology of Mathematics Education (PME-NA 36) in Vancouver, Canada from July 15 to July 20, 2014.*
- Fisher, M., Schack, E., **Wilhelm, J.**, Thomas, J., & McNall-Krall, R. (2014). *Working session presented at the Joint Meeting of the International Group for the Psychology of Mathematics Education (PME 38) and the North American Chapter of the Psychology of Mathematics Education (PME-NA 36) in Vancouver, Canada from July 15 to July 20, 2014.*
- \*Cole, M., & **Wilhelm, J.**, Toma, E. (2014). Partnership Enhancement Model for P-16 Mathematics and Science Education. *Paper presented at the annual meeting of the American Educational Research Association, AERA (Philadelphia, PA).*
- \***Wilhelm, J.**, Toland, M., Jackson, C., Cole, M., and Wilhelm, R. (2014). How instruction, gender, and race affect students' spatial-scientific learning. *Paper presented at the annual meeting of the National Association of Research in Science Teaching (Pittsburgh, PA).*

- \*Cole, M., & **Wilhelm, J. (2014)**. Examining two school districts' approaches to STEM professional development: A Qualitative Study. *Paper presented at the annual meeting of the National Association for Research in Science Teaching, NARST (Pittsburgh, PA).*
- \***Wilhelm, J.**, Jackson, C., Toland, M. D., Cole, M., & Wilhelm, R. (2013). Evaluating middle school students' spatial-scientific performance in Earth-space science. *Paper presented at the 222nd meeting of the American Astronomical Society in Indianapolis, Indiana (June 2 - 6, 2013).*
- \*Cole, M., **Wilhelm, J.**, Jackson, C., and Yang, H. (2013). Exploring the relationships between student moon observations and spatial-scientific reasoning. *Paper presented at the 222nd meeting of the American Astronomical Society in Indianapolis, Indiana (June 2 - 6, 2013).*
- \***Wilhelm, J.**, Jackson, C., Sullivan, A. & Wilhelm, R. (2012). Factors influencing middle school students' spatial mathematics development while participating in an integrated STEM unit. *Paper presented at the Thirty-fourth Annual Meeting of the North American Chapter of the International Group for the Psychology of Mathematics Education. (PME-NA –Kalamazoo, MI).*
- \*Jackson, C. D., **Wilhelm, J.**, Sullivan, A., Wilhelm, R. J. (2012). Gender differences of high and low performing students' spatial reasoning. *Paper presented at the Thirty-fourth Annual Meeting of the North American Chapter of the International Group for the Psychology of Mathematics Education. (PME-NA –Kalamazoo, MI).*
- \***Wilhelm, J.**, Jackson, C., Sullivan, A., & Wilhelm, R. (2012). Explorations in astronomical learning: Researching students' understanding as they engage in Earth/space instruction. *Poster paper presented at EPSCoR conference (Lexington, KY).*
- \***Wilhelm, J.**, Jackson, C., Sullivan, A., and Wilhelm, R. (2012). Exploring variables that affect students' scientific and spatial understanding as they engage in Earth-space science. *Paper presented at the annual meeting of the American Educational Research Association (AERA – Vancouver, Canada).*
- \*Jackson, C., **Wilhelm, J.**, Sullivan, A., and Wilhelm, R. (2012). Gender differences of high and low performing students' spatial reasoning and understanding of lunar phases. *Paper presented at the annual meeting of the American Educational Research Association (AERA – Vancouver, Canada).*
- \*She, X., Matteson, S., Siwatu, K., and **Wilhelm, J. (2012)**. Exploring the effectiveness of interventions designed to deepen preservice teachers' conceptual understanding of Algebra concepts. *Paper presented at the annual meeting of the American Educational Research Association (AERA – Vancouver, Canada).*
- Wilhelm, J. (2011)**. Spatial mathematics learning through implementation of a technology-rich, project-based unit with 21st century educators. *Paper presented at the Thirty-third Annual Meeting of the North American Chapter of the International Group for the*

*Psychology of Mathematics Education*. (PME-NA –Kalamazoo, MI).

**Wilhelm, J. (2011)**. Young children's understandings of science concepts: Implications for school. *Paper presented at the 21<sup>st</sup> European Early Childhood Education Research Association (EECERA) Annual Conference " Education from birth: Research, practices, and educational policy"* (August 2011, Geneva, Switzerland).

Louisell, R. and **Wilhelm, J. (2011)**. What children's conceptions of shadows teach us about the nature of children's thinking. *Paper presented at the 21<sup>st</sup> European Early Childhood Education Research Association (EECERA) Annual Conference " Education from birth: Research, practices, and educational policy"* (August 2011, Geneva, Switzerland).

**Wilhelm, J. (2011)**. Transdisciplinary teaching and learning through implementation of a project-based lunar unit with STEM educators. *Paper presented at the annual meeting of the American Educational Research Association (AERA – New Orleans, Louisiana)*.

**Wilhelm, J. (2011)**. Young children do not hold the classic Earth's shadow misconception to explain lunar phases. *Paper presented at the annual meeting of the National Association for Research in Science Teaching (NARST – Orlando, Florida)*.

**Wilhelm, J. (2011)**. Teaching and learning through a project-based unit implemented with future STEM Educators: A design study. *Paper presented at the annual meeting of the National Association for Research in Science Teaching (NARST – Orlando, Florida)*.

\***Wilhelm, J., Matteson, S., and She, X. (2010)**. Understanding how pre-service teachers think about balance through clinical interviews and a virtual tool. *Paper presented at the 4<sup>th</sup> Annual International Conference on Mathematics & Statistics (Athens, Greece)*.

Louisell, R., **Wilhelm, J., & Kazemek, F. (2010)**. Children's Conceptions of Shadows. *Paper presented at the annual meeting of the National Association for Research in Science Teaching (NARST – Philadelphia, PA)*.

\*Valles, J., She, X., and **Wilhelm, J. (2010)**. How self-beliefs influence minority students' success in high school: A mixed methods study. *Texas National Association of Multicultural Education, University of North Texas, Denton, Texas (March, 2010)*.

\*Clem, D., She, X., and **Wilhelm, J. (2010)**. Changes experienced during year one of an NSF GK-12 program: A mixed methods study. *Paper to be presented at the annual meeting of the American Educational Research Association (AERA – Denver, Colorado)*.

\*She, X., Lan, W., and **Wilhelm, J. (2010)**. A comparative study on pedagogical content knowledge of mathematics teachers in China and the U.S. *Paper to be presented at the annual meeting of the American Educational Research Association (AERA – Denver, Colorado)*.

**Wilhelm, J. (2009)**. Gender differences in lunar-related spatial understandings. *Paper presented at the annual meeting of the North American Chapter of the International Group for the Psychology of Mathematics Education (PME-NA – Atlanta, Georgia)*.



- \***Wilhelm, J.,** She, X., and Clem, D. (2009). Graduate fellows and secondary teachers participate as learners in an interdisciplinary institute. *Paper presented at the annual meeting of the American Educational Research Association* (AERA – San Diego, CA).
- \*Clem, D., **Wilhelm, J.,** and She, X. (2009). Experiencing integration: Changes in one NSF GK-12 “Building Bridges” cohort. *Paper presented at the annual meeting of the American Educational Research Association* (AERA – San Diego, CA).
- Wilhelm, J. (2009).** A case study of children’s original interpretations of the moon’s changing appearance. *Paper presented at the annual meeting of the National Association for Research in Science Teaching* (NARST – Garden Grove, CA).
- \*She, X., **Wilhelm, J.,** and Clem, D. (2009). A summer institute as a tool to facilitate NSF GK-12 program preparation. *Paper presented at the annual meeting of the National Association for Research in Science Teaching* (NARST – Garden Grove, CA).
- \*Walters, K. and **Wilhelm, J. (2009).** The impact of student-generated art on sixth graders’ understanding of the moon’s phases. *Paper presented at the annual meeting of the Association of Teacher Educators* (ATE, 2009, Dallas, Texas).
- \*Ortiz, R., **Wilhelm, J.,** and Ganesh, B. (2009). Pre-service teachers engage in contextual mathematics. *Paper presented at the annual meeting of the Research Council on Mathematics Learning* (RCML – Rome, Georgia).
- Wilhelm, J.** and Wilhelm, R. (2008). Real explorations in astronomical learning. *Paper presented at the 211<sup>th</sup> national meeting of the American Astronomical Society* (Austin, Texas).
- Wilhelm, J. (2008).** Stories about the moon: Case studies of three children’s early thoughts concerning the moon’s appearance. *Paper presented at the annual meeting of the American Educational Research Association* (AERA, 2008, New York City, New York).
- Wilhelm, J.** and Wilhelm, R. (2008). The REAL Curriculum. *Paper presented at the On Being an Engineer: Cognitive Underpinnings of Engineering Education conference* (Texas Tech University, Lubbock, Texas).
- Wilhelm, J.** and Sherrod, S. (2007). Children's stories about the moon: Case studies of three children. *Paper presented at the 17th European Early Childhood Education Research Association (EECERA) Annual Conference "Exploring Vygotsky's Ideas: Crossing Borders"* (August 2007, Prague, Czech Republic).
- Wilhelm, J.,** Sherrod, S., and Walters, K. (2007). Mathematizing the heavens: Pre-service middle level teachers engage in project-based science and mathematics. *Paper presented at the annual meeting of the Association for Science Teacher Education* (ASTE – Clearwater Beach, Florida).
- Wilhelm, J.,** Sherrod, S., and Walters, K. (2007). Experiencing a project-based learning environment: Challenging pre-service teachers to act in the moment. *Paper presented at the annual meeting of the American Educational Research Association* (AERA, 2007,

Chicago, Illinois).

- Wilhelm, J.** and Sherrod, S. (2007). Gender differences in lunar phases understanding. *Paper presented at the annual meeting of the American Educational Research Association (AERA, 2007, Chicago, Illinois).*
- \*Box, C., and **Wilhelm, J.** (2007). One teacher's voice as she enacts project-based instruction with middle school students for the first time. *Paper presented at the annual meeting of the National Association for Research in Science Teaching (NARST – New Orleans, Louisiana).*
- Wilhelm, J.**, Sherrod, S., and Walters, K. (2007). Pre-service teachers experience an interdisciplinary project-based learning environment. *Paper presented at the annual meeting of the National Association for Research in Science Teaching (NARST – New Orleans, Louisiana).*
- \***Wilhelm, J.** and Sherrod, S. (2007). Gender differences in lunar-related science and mathematics domains. *Paper presented at the annual meeting of the National Association for Research in Science Teaching (NARST – New Orleans, Louisiana).*
- \***Wilhelm, J.**, Sherrod, S., and Walters, K. (2007). Pre-service teachers experience project-based mathematics. *Paper presented at the annual meeting of the Research Council on Mathematics Learning (RCML – Cleveland, Ohio).*
- \*Ganesh, B., Ji, J., Sherrod, S., and **Wilhelm, J.** (2007). The development of a geometric spatial visualization assessment. *Paper presented at the annual College of Education Spring Research Conference at Texas Tech University.*
- Bacon, V., Lovering, E., and **Wilhelm, J.** (2007). An 'out of this world' math-science connection. *Paper to be presented at the 2007 Conference for the Advancement of Science Teaching (Austin, Texas).*
- \***Wilhelm, J.** and Walters, K. (2006). Assessing students' understanding of the moon's phases through interdisciplinary inquiry. *Paper presented at the annual meeting of the National Association for Research in Science Teaching (NARST – San Francisco, CA).*
- Smith, W., Beller, C., Mulholland, J., and **Wilhelm, J.** (2006). Engaging preservice elementary teachers in multinational, multi-campus scientific inquiry. *Paper presented at the annual meeting of the Association for Science Teacher Education (ASTE – Portland, Oregon).*
- \***Wilhelm, J.**, Walters, K., and Sherrod, S. (2006). The math in the moon: Pre-service teachers thinking like scientists and mathematicians. *Paper presented at the To Think and Act Like a Scientist: The Roles of Inquiry, Research, and Technology conference (Texas Tech University, Lubbock, Texas).*
- \***Wilhelm, J.** and Walters, K. (2005). Preservice teachers become full participants through engagement in mathematical inquiry. *Paper presented at the annual meeting of the School, Science, and Mathematics Association (SSMA - Fort Worth, Texas).*

- \***Wilhelm, J.**, McMillan, S., and Walters, K. (2005). Pre-service mathematics teachers engage in astronomical inquiry. *Paper presented at the annual meeting of the American Educational Research Association* (Montreal, Canada).
- \*McMillan, S., **Wilhelm, J.**, and Walters, K. (2005). Nature journaling as a path to new literacy identities. *Paper presented at the annual meeting of the American Educational Research Association* (Montreal, Canada).
- Wilhelm, J.** (2005). The role of technology in sound waves understanding. *Paper presented at the annual meeting of the National Science Teachers Association* (Dallas, Texas).
- \***Wilhelm, J.** and Walters, K. (2005). Pre-service math teachers become full participants in inquiry investigations. *Paper presented at the annual meeting of the Research Council of Mathematics Learning* (Little Rock, Arkansas).
- \*McMillan, S., **Wilhelm, J.**, and Walters, K. (2005). Students' stories: Adolescents constructing multiple literacies through nature journaling. *Paper presented at the Texas Tech University College of Education Research Day*.
- Wilhelm, J.**, McMillan, S., and Hintze, E. (2004). Interdisciplinary moon projects and narratives. *Paper presented at the National Science Teachers Association Regional Conference* (Indianapolis, Indiana).
- Wilhelm, J.**, Cooper, S., and McMillan, S. (2004). Pre-service teachers experiencing mathematics through interdisciplinary moon projects and spinning tops. *Paper presented at the North American Chapter of the International Group for the Psychology of Mathematics Education* (Toronto, Ontario).
- Wilhelm, J.** (2004). Students understanding trigonometric relationships through sound waves. *Paper presented at the annual meeting of the Research Council on Mathematics Learning* (Oklahoma City, Oklahoma).
- Cooper, S. and **Wilhelm, J.** (2004). Pre-service teachers experiencing mathematics through inquiry. *Paper presented at the annual meeting of the Research Council on Mathematics Learning* (Oklahoma City, Oklahoma).
- McMillan, S. and **Wilhelm, J.** (2003). Moon studies and other environmental investigations: Students forging new literacy and mathematical identities. *Paper presented at the annual meeting of the American Educational Research Association* (Chicago, Illinois).
- Wilhelm, J.** and Cooper, S. (2003). Mathematics learning in an inquiry-enhanced environment for pre-service teachers. *Paper presented at the annual meeting of the Research Council on Mathematics Learning* (Tempe, Arizona).
- Wilhelm, J.** and Confrey, J. (2003). Designing a project-enhanced classroom. *Paper presented at the annual meeting of the National Council of Teachers of Mathematics* (San Antonio, Texas).
- Wilhelm, J.** and McMillan, S. (2003). Moon investigations: Students forging new literacy and

scientific-mathematical connections. *Paper presented at the National Science Teachers Association Regional Conference* (Kansas City, Missouri).

McMillan, S. and **Wilhelm, J. (2003)**. Moon journaling: Students, teachers, and families partnering to form new literacy identities. *Paper presented at the National Council of Teachers of English, National Conference* (San Francisco, California).

**Wilhelm, J.** and Cooper, S. (2003). Inquiry investigations with tops. *Paper presented at the Tenth Annual Panhandle Area Mathematics and Science Conference* (Canyon, Texas).

Turner, E., **Wilhelm, J.**, and Confrey, J. (2000). Exploring rate of change through technology with elementary students. *Paper presented at the annual meeting of the American Educational Research Association* (New Orleans, Louisiana). [Google Scholar number of citations: 4]

**Wilhelm, J.** and Confrey, J. (2000). Rate of change in the contexts of money and motion. *Paper presented at the annual meeting of the American Educational Research Association* (New Orleans, Louisiana).

### **Invitational Presentations and Conference Participation**

**Wilhelm, J. (2009)**. Invited to participate in an NSF-STEM Symposium entitled *Mathematics Infusion into Science, Technology and Engineering*. (Hofstra University).

**Wilhelm, J. (2006)**. Creating constructivist physics for introductory university classes. *Presented at the weekly Mathematics Education Seminar sponsored through the Department of Mathematics and Statistics*.

**Wilhelm, J. (2004)**. Projecting rate of change in the context of motion onto the context of money. *Presented at the weekly Mathematics Education Seminar sponsored through the Department of Mathematics and Statistics*.

**Wilhelm, J.** and McMillan, S. (April 6<sup>th</sup>, 2004). *Interdisciplinary projects and narratives: Building diverse pathways to success*. Invited presentation at the College of Education's Research Committee Brown Bag Series.

### **Teaching Activities**

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#### **Graduate Courses Taught at University of Kentucky**

SEM 704 – Project-based Environments in Science and Mathematics Education

EDC 730 – Problems of School Curriculum

SEM 603 – Curriculum and Instruction in STEM Education

## **Undergraduate Courses Taught at University of Kentucky**

EDU 300 – Advanced Research Experiences for Undergraduates

## **Undergraduate Courses Taught at Texas Tech University**

PHYS 1403 – Introductory Physics I

EDCI 3370 – Teaching Mathematics at the Middle Level

EDCI 4370 – Middle Level Mathematics: Knowledge, Practice, and Theory

EDCI 4375 – Integrated Mathematics and Science Methods

EDSE 4320 – Secondary Mathematics Methods

EDSE 4311 – Secondary Math/Science Curriculum and Instruction

EDSE 4376 – Secondary Science Methods

## **Graduate Courses Taught at Texas Tech University**

EDCI 5321 – Curriculum Theory: Design and Development

EDEL 5370 – Developing Math Programs in Elementary Education

EDEL 5375 – Developing Science Programs in Science Education

EDCI 5371 – Curriculum and Instruction in Science and Mathematics Education

EDCI 5372 – Assessment Issues in Mathematics and Science Education

EDCI 5373 – Designing Project-Enhanced Environments in Mathematics and Science Classrooms

EDCI 6306 – Advanced Seminar in Curriculum and Instruction

## **Courses Developed**

Graduate Courses for the University of Kentucky STEM Education (Science, Technology, Engineering, and Mathematics) Program - *Designing Project-Enhanced Environments for STEM Classrooms*, and *History of STEM Education*.

Undergraduate Courses for the middle level program at Texas Tech University - *Teaching Mathematics at the Middle Level* (EDCI 3370); *Middle Level Mathematics: Knowledge, Practice and Theory* (EDCI 4370); and *Integrated Mathematics and Science Methods* (EDCI 4375).

## **Co-Designer of the Realistic Explorations in Astronomical Learning (REAL) curriculum**

Developed by R. Wilhelm and J. Wilhelm through funded NASA- IDEAS grant - Cratering Analysis for REAL: Investigating Craters in the Solar System.

[http://www.uky.edu/~jwi229/real/real\\_main.html](http://www.uky.edu/~jwi229/real/real_main.html)

## **Courses Taught at Travis High School, Austin, Texas**

Calculus (AP); Physics (Honors, Pre-AP); Pre-Calculus (Honors, Pre-AP); Algebra

**Courses Taught at Austin Community College, Austin, Texas**

Engineering Physics I and General Physics II

**Courses Taught at Lansing Community College, Lansing, Michigan**

Introductory Physics I and II, Calculus-Based Physics I and II, College Algebra

**Courses Taught at Western Kentucky University, Bowling Green, Kentucky**

Physics of Light, Color, and Optics; Physics I and II

**Courses Taught at Montcalm Community College, Sidney, Michigan**

Calculus, College Algebra

**PhD Students Advised or Served on Committees**

**Students:** K. Sawyer (UK), X. Wu (UK), R. Blackwell (UK), C. Preece (UK), M. Williamson (UK), D. Hood (UK), M. Lamar (UK), M. Cole (UK), A. Arkwright (UK), A. Sullivan (UK), J. Mills (UK), J. Peake (UK), C. Russey (UK), T. Hudson (UK), R. Birch (UK), J. Ferguson (UK), J. Collins (UK), M. A. Schneider (UK), D. Mader (UK), D. Little (UK), Y. Zhang (TTU), M. Cruz (TTU), B. Ganesh (TTU), C. Cross (TTU), K. Walters (TTU), D. Cook (TTU), S. Sherrod (TTU), J. Ji (TTU), C. Box (TTU), X. She (TTU), M. Biggers (TTU), C. Sanchez (TTU), V. Utterback (TTU), D. Clem (TTU).

**Completed Doctoral Dissertation Committees**

*University of Kentucky*

Merryn Cole – UK Chaired (graduated May 2017).

“Spatial Reasoning and Understanding the Particulate Nature of Matter: A Middle School Perspective”

Jody Mills – UK Chaired (graduated May 2016)

“A Mixed Methods Approach to Investigating Cognitive Load and Cognitive Presence in an Online and Face-to-Face College Algebra Course”

Sharon Bixler – UK Co-Chaired (graduated August 2016)

“One-to-One IPAD Technology in the Middle School Mathematics and Science Classrooms”

Larry Grabau – UK Committee Member (graduated August 2016)

“Aspects of Science Engagement, Student Background, and School Characteristics: Impacts on Science Achievement of U.S. Students”

Mark Schneider – UK Committee Member (graduated May 2015)

“The Use of a Digital Game-Based Safety Program for ATV Operational Knowledge for Youthful Riders”

David Little – UK Committee Member (graduated December 2014)

“Measuring post secondary STEM majors’ engagement in sustainability: The creation, assessment, and validation of an instrument for sustainability curricula evaluation”

Ashlie Arkwright – UK Committee Member (graduated December 2014)

“Fourth and Eighth Grade Students’ Conceptions of Energy Flow Through Ecosystems”

Tonja Motley Locklear - UK Committee Member (graduated August 2012)

“ A Descriptive Survey Research Study of the Student Characteristics Influencing the Four Theoretical Sources of Mathematical Self-Efficacy of College Freshmen”

### *Texas Tech University*

Cathy Box (graduated August 2008) – TTU Committee Member

“Formative Assessment: Patterns, Personal Practice Assessment Theories, and Impact on Student Achievement and Motivation in Science”

Xiaobo She (graduated 2011) – TTU Chaired until 2009 (when moved to Kentucky) Remained Committee Member

“Exploring the effectiveness of interventions designed to deepen preservice teachers’ conceptual understanding of linear function and slope: A mixed methods study”

Bibi S. Ganesh (graduated 2010) – TTU Chaired until 2009 (when moved to Kentucky) “Middle School Teachers’ Perceptions of Integration of Science and Mathematics Instruction as They Engage in an Integration-focused Online Course”

Kendra Walters (graduated 2009) – TTU Chaired until 2009 (when moved to Kentucky) “The Impact of Student-Generated Art on Sixth Graders’ Understanding of the Moon”

### **Masters’ Committees**

#### *University of Kentucky*

**2016 – present:**

## **Masters in Education**

Emily Dreissen, Kyle Curry, Nicole Wiencek

### **2010 – 2015**

**Masters of Arts in Teaching (15):** Lauren Moorhead, Justin LeVaughn, Jacob Rexroat, Maram Haddad, Martin Christensen, Matt Beaulieu, Phil Prokes, Scott Siemen, Steven Vogel, Julie Bowles, Greg Edens, Nicole Markert, Andrea Schnittka, Victoria Perry, Tommy Warner

### *Texas Tech University*

### **2002 - 2009**

**Masters in Education (10):** C. Hayes (TTU), A. Malouf (TTU), B. Ganesh (TTU), A. Bentley (TTU), A. Hardin (TTU), R. Bunuan (TTU), K. Walters (TTU), G. Kim (TTU), K. Jewel (TTU), J. Middleton (TTU).

**Masters in Science (3):** J. Middleton (TTU, Education and Biology), T. Hollingsworth and B. Duke (TTU, Mathematics and Statistics Department).

## **Service**

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### **Professional and National Service**

- Editorial Board Member of the journal *Educational Research Applications* (2016 – present)  
<http://gavinpublishers.com/journal-of-educational-research-applications-editorial-board/>
- JRST (Journal of Research in Science Teaching) Award Selection Committee (2013 – 2016)
- School Science and Mathematics Association (SSMA) Convention Committee Member (2015-2017)
- Board member - National Advisory Review Board for the Exemplary Science Programs (ESP) for the National Science Teachers Association (2011 – 2013)
- Consulting Editor for *The Journal of Educational Research* (2012 – 2015)
- National Association for Research in Science Teaching (NARST) Program Committee member: Strand 7-Pre-service Science Teacher Education (2010-2012)
- National Science Foundation Panels:
  - Served on the Innovative Technology Experiences for Students and Teachers (ITEST) National Science Foundation Panel (Spring, 2009)
  - Served on the Presidential Awards for Excellence in Mathematics and Science Teaching (PAEMST) National Science Foundation Panel (Summer, 2009 and Summer, 2010).
- Committee member of The Leadership Collaborative (TLC) on common core standards and teacher preparation of the Science & Mathematics Teacher Imperative (SMTI) of the



- Association of Public and Land-Grant Universities (APLU) (2010 – 2012)
- Serve on Advisory Panel for Hofstra’s Phase II Math Science Partnership (2010 – 2011)
- Serve on Advisory Panel for Texas Tech University’s Middle School Math and Science: Understanding by Design Program (2010 – 2011)
- External Reviewer for Promotion and Tenure
  - 2009 – Texas A & M University
  - 2010 – Oklahoma State University
  - 2011 – Missouri State University
  - 2012 – North Carolina State University
  - 2013 – University of Texas at El Paso

Reviewer for:

- *Journal of Mathematics, Science and Technology Education*, Editor: Mehmet Fatih
- *Paper proposals for the Thirty-second Annual Meeting of the North American Chapter of the International Group for the Psychology of Mathematics Education.*
- *Research in Science Education*, Editor: Stephen M. Ritchie;
- *School Science and Mathematics*. Editor: Carla Johnson;
- *International Journal of Science and Mathematics Education*. Editor: Fou-Lai Lin;
- *The Science Teacher*. Editor: Stephen Metz;
- *Science Scope*. Editor: Inez Liftig;
- *Electronic Journal of Science Education*. Editor: Dr. John Cannon/Dr. Michael Kaman;
- *Journal of Research in Science Teaching*. Editors: J. Randy McGinnis, Angelo Collins;
- *International Journal of Mathematical Education in Science and Technology*. Editor: Dr. M. C. Harrison;
- *Mathematics Teaching in the Middle School*. Editor: Sandy Berger
- *Early Childhood Education Journal*. Editor: Mary Renck Jalongo

**University Service**

- Member of College of Engineering Chair Reviewing Committee (Spring, 2011)
- State Science Standards Postsecondary University of Kentucky Representative (2010 – 2011)
- University of Kentucky Co-Chair of the 2011 – 2012, 3<sup>rd</sup> Annual STEM Symposium
- University of Kentucky Co-Chair of the 2010 – 2011, 2<sup>nd</sup> Annual STEM Symposium: *Connecting STEM Education Across the Bluegrass.*
- University of Kentucky Co-Chair of the 2009 – 2010, 1<sup>st</sup> Annual STEM Symposium: *Education Infusion into Science, Technology, Engineering, and Mathematics.*
- Faculty member of the Partnership Institute for Mathematics and Science Education (PIMSER) at the University of Kentucky
- Texas Tech University Women in Science and Engineering (WISE) organization where I served as a University Wise Mentor (2007 – 2009).
- Served on the Steering Committee for the 2004 and 2005 ExxonMobil Texas State

- Science and Engineering Fairs hosted by Texas Tech University.
- Judge for the 2004 Regional (West Texas) Science Fair.
- Judge for the 2004 Texas State Science and Engineering Fair.

### **College of Education Service**

- STEM Education Department Chair (2011 – present)
- Member of Search Committee for Science Education Clinical Position (2012-2013)
- Member of Search Committee for Mathematics Education Clinical Position (2013-2014)
- Member of Search Committee for Mathematics Education Tenure Track Position (2013-2014)
- Search Committee Chair for Science Education Clinical Faculty Appointment (2013)
- Assisted in the establishment of a STEM Education Department in the College of Education at the University of Kentucky (2009 – 2011)
- University of Kentucky Search Committee Chair for Mathematics Education Faculty Position (2010)
- University of Kentucky Faculty Council (Fall 2009)
- Mentor of UK Assistant Professors: M. Mohr-Schroeder, J. Bouwma-Gearhart, M. Fisher, C. Jackson (2009 – 2011)
- Mathematics Program Faculty Member (2009 – present)
- Science Program Faculty Member (2009 – present)
- Texas Tech University (TTU) Program Coordinator of Science and Mathematics Education Program (2007 – 2009)
- TTU Search Committee Chair for Mathematics Education Faculty position (2009)
- TTU Research Committee (2005 – 2007) – Served as Chair (2006-2007)
- TTU Faculty Council (2002-2005)
- TTU Search Committee Chair for Mathematics Education and Science Education Faculty positions (2007 – 2008)
- TTU Search Committee Member for College of Education Associate Dean of Graduate Education and Research
- TTU Leadership Council (2006 – present)
- TTU Graduate Adhoc Committee (2006 – present)
- TTU Search Committee Member for Science Education Faculty position (2005)
- TTU Search Committee Member for Chair of Curriculum and Instruction Department (2006)
- TTU Search Committee Member for Educational Psychology Faculty position (2007)
- TTU Undergraduate Multidisciplinary Science advisor
- TTU Adhoc College of Education Technology Committee (2003)

- TTU College Wide Technology Committee (2003-2004)
- TTU Co-Developer of joint Math/Science Middle Level Program
- TTU Co-Developer of Math/Science Education Ph.D. Program

**Community Service**

- 13 week STEM After School Program in Woodford County (Spring, 2013)
- NSF NOYCE teacher workshop (2013)
- Dept. of Education MUSE teacher workshops (2013)
- Teacher Professional Development with REAL (2010 – 2013)
- Kentucky Teacher Internship Program Higher Education Mentor (Education Professional Standards Board) (2010 – 2011)
- Conducted “Math and Science of NASCAR” professional development teacher workshop at University of Kentucky (Summer 2011)
- Conducted “Math and Science of NASCAR” professional development teacher workshop at University of Kentucky (Fall 2010)
- Assisted in “Math and Science of NASCAR” professional development teacher workshop at University of Kentucky (Spring 2010)
- Middle School Star Viewing Outreach Fieldtrip with St. John School in Georgetown, Kentucky (Fall 2010)
- Organized and conducted fieldtrips to Skyview Observatory (2006-2007)
- Obtained a NASA Space Science IDEAS Grant that funded projects, curricular materials development, and computers for Irons and Dunbar Middle Schools (2006-2007)
- Designed and Implemented an afterschool program at Rush Elementary School (Lubbock, Texas) – *Science in Our World* (Spring, 2005)
- Conducted Moon, Planet, and Galaxy Observations (using Telescopes) with Rush Elementary, Wheatley Elementary, and a Lubbock Girl Scout Troop (2004).
- Co-Designed and implemented an interdisciplinary Math/Science/English unit at Irons and Dunbar Middle Schools (2003 – 2009).

**Professional Affiliations**

American Educational Research Association
American Astronomical Society
School Science and Mathematics
National Science Teachers Association
Research Council on Mathematics Learning
National Association of Research in Science

Teaching
National Council of Teachers of Mathematics
North American Chapter of the International Group for the Psychology of Mathematics Education