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CURRICULUM VITAE

AFFILIATION

- School of Sciences, Saint Francis University

PROFESSIONAL EXPERIENCE (POSITIONS HELD)

2014 – present Director, Science Outreach Center, Saint Francis University

2016 – present Adjunct professor
Saint Francis University, Loretto PA
CORE: 113: Big Ideas that Changed Humankind
Physics 102: Descriptive Astronomy
Physics 104: Introduction to Physics I
Physics 105: Introduction to Physics II
Science 101: Science for Active Citizenship

2009 – present Adjunct professor
Moberly Area Community College (MACC), Columbia, MO
Physics 262: General Astronomy, traditional course
Physics 262: General Astronomy, online course
Physics 262: General Astronomy, hybrid course (blended online and traditional)
Physics 264: Atmospheric Science, traditional course
Physics 264: Atmospheric Science, online course

2012 – 2014 Postdoctoral fellow
Department of Physics and Astronomy, MU

2011 – 2012 Postdoctoral teaching fellow
Sustainable Energy, Mizzou Advantage, MU
Instructor/Lecturer/Course Developer
Topics in Physics 1002-01: The Energy of the Sun
Topics in Physics 1002-02: The Energy of the Earth
Topics in Physics 1002-03: Anthropology of Sustainable Energy

2010 – 2014 Summer Instructor/Lecturer
MizzouOnline: SelfPaced, MU
Online Astronomy Course: Introduction to Astronomy 1010
Online Laboratory Astronomy Course: Introduction to Astronomy 1020

2008 – 2014 Instructor
MizzouOnline, MU
Astronomy 1010: Introduction to Astronomy



Saint Francis University

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2007 – 2014 Curriculum Developer/Instructor
 Department of Physics and Astronomy, MU
A Time for Physics First (Summer Academy for Ninth Grade Science Teachers)
 A partnership among the University of Missouri-Columbia (MU), and 37 school districts

2010 – 2011 Instructor/Lecturer
 Department of Physics and Astronomy, MU
 Astronomy 1010: Introduction to Astronomy
 Astronomy 1020: Introduction to Laboratory Astronomy

2008 (Fall) Co-Instructor with Prof. W. Montfrooij
 Department of Physics and Astronomy, MU
 Astronomy 1010: Introduction
 Astronomy 1020: Introduction to Laboratory Astronomy

2007 – 2009 Teaching Assistant for Prof. H. Chandrasekhar and Prof. A. Speck
 Department of Physics and Astronomy, MU
 Astronomy 1010: Introduction to Astronomy
 Astronomy 1020: Introduction to Laboratory Astronomy

2006 – 2007 Research Assistant for Prof. J. Wedman
 SISLT, College of Education, MU
 I³ project, design and co-development of network collaboration software

2004 – 2007 Research Assistant for eMINTS
 SISLT, College of Education, MU
 eThemes national program, evaluation and collection of internet resources on physical sciences for support of K-12 educators

2002 – 2004 Animations and Video Production Specialist
 Department of Student Life, MU
 Creation and maintenance of websites for 18 departments and student organizations

2001 – 2002 Research Assistant for the School of Journalism
 Photojournalism, School of Journalism, MU
 50 Most Memorable Pictures, preservation and archival of photographic glass plates; creation of a 1 hour 25 minutes interactive CD with archived historical photographs and audio recordings

EDUCATION

2011 Ph.D., Information Science and Learning Technologies with emphasis area in Astrophysics
 School of Information Science and Learning Technologies
 University of Missouri, Columbia, MO

2003-2005 Ed.S., Network Learning,
 School of Information Science and Learning Technologies
 University of Missouri, Columbia, MO

- 2001-2003 M.A., Journalism/Advertising Management,
School of Journalism
University of Missouri, Columbia, MO
- 1991-1996 B.A., Philology/Journalism,
School of Philology
University of Rostov-on-Don, Rostov-on-Don, Russia

DISSERTATION THESIS

- 2011 The Effects of Computer-Supported Inquiry-Based Learning Methods and Peer Interaction on Learning Stellar Parallax.

AREAS OF REASEARCH

- Efficacy of computer-based technologies in astronomy and physics education
- Inquiry-based learning in formal and informal learning environments
- Causality and scientific reasoning in formal and informal learning environments
- Effectiveness of delivery methods (face-to-face, blended, online learning) in formal and informal learning environments

SPECIALIZATION

- Community and K-12 Science Outreach
- Astronomy Education Research

BOOKS

- Montfrooij, W & Ruzhitskaya, L. (2015). *Astronomy! A conceptual introduction from the Big Bang to that asteroid heading right for us.* Columbia, MO: Mizzou Publishing.
- Montfrooij, W & Ruzhitskaya, L. (2014). *A Physics Primer for students forced to take astronomy.* Columbia, MO: Mizzou Publishing.

JOURNAL & CONFERENCE PROCEEDINGS

- Ruzhitskaya, L. & Montfrooij, W. (2016). *Visual explanations behind important equations in astronomy.* European Journal of Physics. Under review.
- Montfrooij, W., & Ruzhitskaya, L. (2016). *Teaching superfluidity at the introductory level.* European Journal of Physics. Under review.
- Ruzhitskaya, L., A. Speck, N. Ding, S. Baldrige, S. Witzig, & J. Laffey (2012). Going Virtual... or Not: Development and Testing of a 3D Virtual Astronomy Environment. In *Proceedings of Communicating Science, ASP Conference Series, 2012. Edited by J. Barnes, C. Shupla, J.G. Manning and M.G. Gibbs. San Francisco: Astronomical Society of the Pacific, 2013, 473, p. 255.*
- Ruzhitskaya, L. & Montfrooij, W. (2010). Teaching Gravity and Tides: Use Textbooks, Simulations or Videos? In *Proceedings of Earth and Space Science: Making Connections in Education and public Outreach, ASP Conference Series, 2011, 443, (pp. 481-485), Boulder, CO: Astronomical Society of the Pacific.*
- Ruzhitskaya, L. & Montfrooij, W. (2010). Gravity and Tides: How Students Do Not Get It? *Cosmos in the Classroom 2010, 2010, 12, (pp. 68-70), Boulder, CO: Astronomical Society of the Pacific.*
- Nuankhieo, P., Ruzhitskaya, L., Moore, L. J., & Speck, A. (2008). Affordances of An Astronomy Laboratory Simulation, *Academic Exchange Quarterly, 12(4), 136-141.*

- Ruzhitskaya, L. & Speck, A. (2008). Computer-Based Simulation: Stimulating Learning in Astronomy. In *Proceedings of World Conference on Educational Multimedia, Hypermedia and Telecommunications 2008* (pp. 5389-5396). Chesapeake, VA: AACE.
- Ruzhitskaya, L. & Speck, A. (2008). Impact of Spatial and Social Presence on Learning in Virtual Learning Environments. In *Proceedings of World Conference on Educational Multimedia, Hypermedia and Telecommunications 2008* (pp. 5379-5388). Chesapeake, VA: AACE.
- Nuankhieo, P., Ruzhitskaya, L. & Speck, A. (2008). An Exploratory Study of Affordances of CLEA Interface in Astronomy Laboratory Simulation. In *Proceedings of World Conference on Educational Multimedia, Hypermedia and Telecommunications 2008* (pp. 1560-1568). Chesapeake, VA: AACE.
- Ruzhitskaya, L. & Speck, A. (2007). Finding Stellar Properties: From Parallax to Radius. *Cosmos in the Classroom 2007*, 2007, Astronomical Society of the Pacific, Claremont, CA. 139-142.
- Ruzhitskaya, L. (2006). Three-Dimensional Interactive Images: What Are They Good For? In T. Reeves & S. Yamashita (Eds.), *Proceedings of World Conference on E-Learning in Corporate, Government, Healthcare, and Higher Education 2006* (pp. 1767-1771). Chesapeake, VA: AACE.
- Tsai, H., Ruzhitskaya, L. & Shen, D. (2006). Effect of Different Discussion Structures in Online Case-Based Instruction. In T. Reeves & S. Yamashita (Eds.), *Proceedings of World Conference on E-Learning in Corporate, Government, Healthcare, and Higher Education 2006* (pp. 2442-2447). Chesapeake, VA: AACE.
- Westergren, G., Moss, A., Current, N., Kobayashi, T., Lynch, S., Ruzhitskaya, L. & Yadamsuren, B. (2006). I³ – Innovation Information Infrastructure. In T. Reeves & S. Yamashita (Eds.), *Proceedings of World Conference on E-Learning in Corporate, Government, Healthcare, and Higher Education 2006* (pp. 3124-3126). Chesapeake, VA: AACE.

CONFERENCE PRESENTATIONS

INTERNATIONAL CONFERENCES

- Ruzhitskaya, L., Speck, A., Baldrige S., & Briggs, J. (2014). Reaching to the Star. Poster session presented at the meeting of the 223rd American Astronomical Society, AAS Meeting #223, Washington, DC. *In Bulletin of the American Astronomical Society*, 444.06. ##
- Speck, A., Ruzhitskaya, L. & Whittington, A. (2014). Assessment of Teaching Methods and Critical Thinking in a Course for Science Majors. *In Bulletin of the American Astronomical Society Meeting, AAS Meeting 223, #332.04, Washington, DC.* ++
- Briggs, J., Ruzhitskaya, L. & Speck, A. (2014). Mizzou Student Astronomical Society – Benefiting Everyone. Poster session presented at the meeting of the 223rd American Astronomical Society, AAS Meeting #223, Washington, DC. *In Bulletin of the American Astronomical Society*, 160.10. ##
- Ruzhitskaya, L., Speck, A. Ding, N., Baldrige, S., Witzig, & Laffey, J. (2012). Going Virtual... or Not: Development and Testing of a 3D Virtual Astronomy Environment. In *Proceedings of Communicating Science, ASP Conference Series*, 2012. Edited by J. Barnes, C. Shupla, J.G. Manning and M.G. Gibbs. San Francisco: Astronomical Society of the Pacific, 2013, 473, p. 255. ##
- Ruzhitskaya, L. & Speck, A. (2012). Astronomy in Sustainable Energy: A New Approach to Make It Matter, *In Bulletin of the American Astronomical Society Meeting, AAS Meeting 219, Austin, TX.* ++
- Speck, A., Ruzhitskaya, L., Laffey, J. & Ding, N. (2012). 3D Virtual Reality for Teaching Astronomy, *In Bulletin of the American Astronomical Society Meeting, AAS Meeting 219, Austin, TX.* ++
- Ruzhitskaya, L. & Speck, A. (2011). Peer interaction: help or distraction? *In Bulletin of the American Astronomical Society Meeting, AAS Meeting 217, Seattle, WA*, 43. ++
- Speck, A. & Ruzhitskaya, L. (2011). Guided Versus Unguided Learning: Which One To Choose? *In Bulletin of the American Astronomical Society Meeting, AAS Meeting 217, Seattle, WA*, 43. ++

- Ruzhitskaya, L. & Montfrooij, W. (2010, August). *Gravity and tides: How students do not get it?* Poster session presented at the meeting of the Cosmos in the Classroom 2010, Astronomical Society of the Pacific, Boulder, CO. ##
- Ruzhitskaya, L., Speck, A. & Laffey, J. (2010, January). *Virtual Jupiter - Real Learning*. Poster session presented at the meeting of the 215th American Astronomical Society, AAS Meeting #215, Washington, DC. *In Bulletin of the American Astronomical Society, 42, p.506.* ##
- Speck, A., Ruzhitskaya, L. Whittington, A. & Witzig, S. (2010, January). Focusing on the Processes of Science Using Inquiry-oriented Astronomy Labs for Learning Astronomy. *In Bulletin of the American Astronomical Society Meeting, AAS Meeting #215, Washington, DC, 42, p.439.* ++
- Ruzhitskaya, L., French, R. & Speck, A. (2009, May). Kepler's Laws in an Introductory Astronomy Laboratory: The Influence of a Computer-based Simulation Used with Multiple Variables. *In Bulletin of the American Astronomical Society Meeting, AAS Meeting #214, Pasadena, CA, 41, p.753.* ++
- Ruzhitskaya, L. & Speck, A. (2009, January). Misconceptions in Astronomy: Before and After a Constructivist Learning Environment. *In Bulletin of the American Astronomical Society Meeting, AAS Meeting #213, Long Beach, CA, 41, p.494.* ++
- Speck, A., Ruzhitskaya, L. & Weaver, J. (2009, January). Innovations in Inquiry-Based Laboratory Exercises for Non-Majors Astronomy Courses: Connecting Undergraduates with the Enterprise of Science. *In Bulletin of the American Astronomical Society Meeting, AAS Meeting #213, Long Beach, CA, 41, p.494.* ++
- Ruzhitskaya, L. & Speck, A. (2008, May). *Project CLEA – The Moons of Jupiter: Understanding the Kepler's Laws in Astronomy 101*. Poster session presented at the American Astronomical Society, AAS Meeting #212, #40.02, Saint Louis, Missouri. *In Bulletin of the American Astronomical Society, 40, p.240.* ##
- Ruzhitskaya, L. & Speck, A. (2008, July). Computer-Based Simulation: Stimulating Learning in Astronomy. Presented at *World Conference on Educational Multimedia, Hypermedia and Telecommunications 2008*, Vienna, Austria. ++
- Ruzhitskaya, L. & Speck, A. (2008, July). Impact of Spatial and Social Presence on Learning in Virtual Learning Environments. Presented at *World Conference on Educational Multimedia, Hypermedia and Telecommunications 2008*, Vienna, Austria. ++
- Nuankhieo, P., Ruzhitskaya, L. & Speck, A. (2008, July). An Exploratory Study of Affordances of CLEA Interface in Astronomy Laboratory Simulation. Presented at *World Conference on Educational Multimedia, Hypermedia and Telecommunications 2008*, Vienna, Austria. ++
- Ruzhitskaya, L. & Speck, A. (2007, December). Stellar Properties in the Classroom: From Parallax to Radius. *In Bulletin of the American Astronomical Society Meeting, AAS Meeting #211, Austin, TX, 39, p.861.* ++
- Ruzhitskaya, L. & Speck, A. (2007, August). *Finding Stellar Properties: From Parallax to Radius*. Poster session presented at the symposium of Cosmos in the Classroom 2007, Astronomical Society of the Pacific, Claremont, CA. ##
- Ruzhitskaya, L. (2006, October). Three-Dimensional Interactive Images: What Are They Good For? Presented at *World Conference on E-Learning in Corporate, Government, Healthcare, and Higher Education 2006*, Honolulu, HI. ++
- Ruzhitskaya, L. (2006, October). *Three-Dimensional Interactive Images: What Are They Good For?* Poster session presented at *World Conference on E-Learning in Corporate, Government, Healthcare, and Higher Education 2006*, Honolulu, HI. ##
- Westergren, G., Moss, A., Current, N., Kobayashi, T., Lynch, S., Ruzhitskaya, L. & Yadamsuren, B. (2006, October). *i³ – Innovation Information Infrastructure*. Poster session presented at *World Conference on E-Learning in Corporate, Government, Healthcare, and Higher Education 2006*, Honolulu, HI. ##

Schmidt, M., Turner, P., Ruzhitskaya, L., Pomerence, B., Johnson, M., Nuankhieo, P., & Current, N. (2006, October). *Creating a 3D Mashup: Google Earth Pro + Your University in 3D*. Poster session presented at *World Conference on E-Learning in Corporate, Government, Healthcare, and Higher Education 2006*, Honolulu, HI. ##

STATE CONFERENCES

Schmidt, M., Turner, P., Ruzhitskaya, L., Pomerence, B., Johnson, M., Nuankhieo, P., & Current, N. (2007, March). *Creating a 3D Mashup: Google Earth Pro + Your University in 3D*. Poster session presented at the meeting of the Graduate Education Week, Graduate School, University of Missouri, Columbia, MO. ++

Ruzhitskaya, L. (2006, October). *Three-Dimensional Interactive Images: What Are They Good For?* Presented at the meeting of the *Graduate Education Week*, University of Missouri, Columbia, MO. ++

Ruzhitskaya, L. (2006, October). *Three-Dimensional Interactive Images: What Are They Good For?* Poster session presented at the meeting of the Graduate Education Week, University of Missouri, Columbia, MO. ##

NOTE: ++ denotes oral presentations, ## denotes poster presentation

GRANTS

FUNDED & PENDING

- *Enhancing Pathways of STEM through Computing Applications*, Co-PI, \$1.6M, April 2016, DRK-12, NSF. Status: pending.
- *STEM Summer Academies 2018*, PI, \$25K, January 2018, The EQT Foundation. Status: funded.
- *Cosmic Arts: Nebulae in Acrylic*, PI, \$2.1K, September 2017, Project STREAM, Pennsylvania Council on the Arts. Status: funded.
- *STEM Summer Academies 2017*, PI, \$10K, May 2017, The EQT Foundation. Status: funded.
- *Red Sky*, PI, \$4.4, February 2017, Julena Steinheider Duncombe Mini-Grants, American Astronomical Society (AAS). Status: funded.
- *Headwaters to Estuaries: Best Management Practices for Systemic Watershed Education*, PI, \$104K, August 2016, B-WET, NOAA. Status: funded.
- *Cosmic Arts*, PI, \$1.1K, October 2016, Project STREAM, Pennsylvania Council on the Arts. Status: funded.
- *Inspiring scientific literacy in children*, PI, \$78K, 2015. A. J. and Sigismunda Palumbo Charitable Trust. Status: funded.
- *Quantum Quest Fest*, \$1K, 2015, DelGrosso Foods Inc. Status: funded.
- *Quantum Quest Fest*, \$1K, 2015, Sheetz, Inc. Status: funded.
- *Aspirations in Computing in Greater Johnstown*, \$1K, 2015, National Center for Women & Information Technology (NCWIT) Outreach Award. Status: funded.
- *Reaching to the Star*, PI, \$3K, 2012. The Student Fee Capital Improvement Committee. Status: funded.
- *VLE-STAR: Virtual Learning Environment for Scientific Thinking in Astronomy*, Co-PI, \$150K, 2009-2011, CCLI, NSF. Status: funded.

PROFESSIONAL TRAINING AND CERTIFICATIONS

- Grant Writing Certification, 2012
University of Missouri, Columbia, MO

- CAE/CATS Tier II Special Topics Workshop: Using Technology in the Classroom Certification, 2012
NASA-sponsored Center for Astronomy Education, Austin, TX
- College Introductory Astronomy for Non-Science Majors Certification, 2008
NASA-sponsored Center for Astronomy Education, St. Louis, MO
- College Introductory Astronomy for Non-Science Majors Certification, 2007
NASA-sponsored Center for Astronomy Education, Dearborn, MI
- Information Experience Laboratory Usability Testing Certification, 2006
University of Missouri, Columbia, MO
- New Media Certification, SISLT, 2002
University of Missouri, Columbia, MO

RESEARCH SKILLS

Development/Implementation/Analysis

- Quantitative and qualitative data analysis:
 - Research design, surveys, semi-structured interviews, content analysis, direct observations, summative and formal assessments
- Usability testing
- SPSS, statistical program
- Morae & NVivo, qualitative data analysis software

COMPUTER SKILLS

- Web Development: HTML, DHTML, CSS, JavaScript, Perl, PHP, ActionScript, Dreamweaver
- Web Design: Photoshop, Illustrator, InDesign
- 3D Modeling: 3Ds Max, Maya, Blender, SketchUp, Tinkercad, Autodesk 123D, Sculptris, Meshmixer
- Video Production: Premier, FinalCut

PUBLIC OUTREACH

- Managing 14 programs offered by the Science Outreach Center

PROGRAMS NEWLY DEVELOPED BY ME

- *Cosmic Arts*, this program is open to the public for children in grades 4+ as well as adults. The month long program presents lessons on related topics and discoveries in astronomy. During these lessons, various art techniques are used to create artistic and scientific paintings of unexplored worlds. The participants' art is showcased at the Hollidaysburg Area Public Library. The program began February of 2017 and will continue with a second year this upcoming February 2018. This program is partially funded by a grant from the Pennsylvania Rural Arts Alliance.
 - My role: initiator, organizer and coordinator.
- *Cosmic Cocktails*, the program is a part of the international network of Science Cafés. It is a series of public talks and conversations on a wide variety of topics in science. Every month we invite a scientist from different fields of science to discuss the history and importance of the latest discoveries in her/his field. From quarks to the universe, from cells to mammals, from the human brain to robots, it's all about science and discoveries! We serve an educational and entertaining program: cocktails with a splash of science.
 - My role: initiator, organizer and coordinator.
- *Cosmic Treats*, a monthly series of science talks about discoveries in the universe with tasty treats from the local kitchen. The talks, which are enhanced by hands-on activities and trivia games, are presented by professors from the School of Sciences at Saint Francis. The program is aimed for a

wide audience: from kindergarteners to their grandparents. The program is hosted by the Hollidaysburg and Patton public libraries. Monthly attendance: 50-60 participants.

- My Role: initiator, organizer and coordinator.
- *Excellence in STEM Outreach Community Award*, the Award is sponsored by the Science Outreach Center to recognize excellence and dedication to science outreach efforts in local communities by the members of these communities. The recipients of the awards are honored during the School of Sciences Awards Ceremony at the Saint Francis University Science Center in April of each year.
 - My role: the chair of the committee 2014-2016.
- *Headwaters to Estuaries: Best Management Practices for Systemic Watershed Education*, a professional development program for middle and high school teachers funded by the NOAA Chesapeake Bay Watershed and Training program (B-WET). The program aims to facilitate the development of meaningful watershed educational experiences (MWEEs) through integrative curriculum units, and make the existing watershed curriculum developed by trained teachers while using watershed systems as a context for learning. The program consists of Summer Institute, curriculum development and activities during the fall of 2017, and a student competition at the Regional Watershed Festival in December 2017.
 - My Role: organizer, coordinator, and co-instructor.
- *Kids' College @ SFU*, these summer STEAM camps are designed for school children in grades 1 through 10. These camps introduce children to several branches of science: astronomy, biology, chemistry, environmental engineering, and physics. In each camp, children become scientists who critically observe the surrounding environment, pose scientific questions, conduct experiments, collect and analyze data, and draw their own conclusions. Each camp includes daily (weather permitting) outside activities: field trips, short hikes, games, and physical exercises.
 - My role: initiator, organizer and co-instructor.
- *Quantum Quest Fest (Q²Fest)*, a program dedicated to increasing science awareness and initiating a life-long love of science in the younger generation. The program is built around the *Quantum Quest: A Cassini Space Odyssey* movie. With participation of high-school students as the designers and creators of their science stations during *Quantum Quest Game* – the main event of the program – during which elementary and middle school children explore various sciences and participate in hands-on activities prepared for them by the high school students, their teachers, and students and faculty from SFU. The program includes visitations to schools and talks by our invited guest speakers: Dr. Harry Kloor (a movie producer and a scientist) and Dr. Linda Godwin (a physicist and an astronaut). Attendance: 1000 participants
 - My role: initiator, organizer and coordinator.
- *Red Sky*, the purpose of this program was to organize a series of public-education events in preparation for the Great American Eclipse and, in the process, to establish a long-lasting program of sidewalk astronomy to serve local rural low-income communities in Bedford, Blair, Cambria, and Somerset counties of South Central Pennsylvania. This program consists of a series of public talks and workshops for children, their parents, and teachers; sidewalk astronomy; astronomy activities in schools (class time and afterschool programs); and activities during summer camps offered by the Center.
 - My role: initiator, organizer and coordinator.
- *Rural Science Physics, Astronomy, Space, Engineering (R-SPACE)*, a collaborative effort among physics, astronomy, chemistry, and environmental engineering professionals and university students who wish to bring science to remote rural corners of Pennsylvania. The purpose of this collaborative work is to demonstrate to students that any phenomenon in science can be and should be explained by different sciences. R-SPACE, a sister program of R.O.C.K., aims to bring exciting aspects of science to K-12 children and local communities in the form of hands-on activities and stimulating demonstrations. Attendance: 300 participants
 - My role: initiator, organizer and coordinator.

- *Solar System 5K*, a program that unifies health and natural sciences in one event. It is a fun family activity and a 5K run/walk through our solar system which we scaled down to five kilometers. During this run/walk participants experience and learn to appreciate distances that separate planets and other objects in the solar system. The program includes interesting information about various sciences, fun facts about the solar system, hands-on activities, science demonstrations and games at each planetary station. Attendance: 100 participants
 - My role: initiator, organizer and coordinator.
- *Science of Toys and Solar Viewings*, throughout a year the Science Outreach Center represents SFU's School of Sciences in several community events organized by the local communities. During Potato and Pumpkin fests and Girl Scouts fairs the Center organizes solar viewings, hands-on activities for kids, demonstrations and experiments of concepts in astronomy, chemistry, and physics. Attendance: from 100 to 500 per event.
 - My role: initiator, organizer and coordinator.

EXISTED PROGRAMS MANAGED BY ME

- *21st Century Mathematics Workshop*, this workshop is for parents, grandparents and caretakers who would like to better assist their child in learning mathematics. Participants will learn about recent research in cognitive science and mathematics education in relation to effective mathematics learning; develop a conceptual knowledge of addition, subtraction, multiplication, and division; learn simple activities to do with children at home to enhance their understanding of arithmetic operations; gain a valuable list of resources; and have the opportunity to ask questions.
 - My role: coordinator.
- *Award for Aspirations in Computing, National Center for Women & Information Technology (NCWIT)*, the program honors young women at the high-school level for their computing-related achievements and interests. Awardees are selected for their computing and IT aptitude, leadership ability, academic history, and plans for post-secondary education. The Science Outreach Center coordinates the competition with a dozen of the regional participating organizations and hosts the award ceremony on SFU campus. Attendance: 100 participants. Hosted since 2014.
 - My role: chair of the committee, coordinator.
- *Math and Science Partnership Reflection and Application of Mathematical Practice (MSP-RAMP)*, a partnership program between Saint Francis University and Appalachia Intermediate Unit 8. The program annually provides professional development for approximately 40 secondary math teachers in school districts within IU8's region. The goals of the project are to deepen the knowledge of mathematics content and effective instructional pedagogies while establishing a learning community of educators. Hosted since 2013.
 - My role: coordinator.
- *STEM Summer Academies*, week-long programs designed to provide an opportunity for talented high school students between their sophomore/junior and junior/senior years to experience science, engineering and computer science in action. Seven academies are scheduled for 2016. Three academies were hosted since 2009.
 - My role: director.
- *Science Day*, a program is designed for high school students from the region to give them an opportunity to visit the campus, to compete in teams in a single elimination science bowl competition, and or attend three different presentations across campus. Attendance: 700 participants (high school students and SFU students and faculty). Hosted since 1994.
 - My role: co-director.
- *PA Statistics Poster Competition*, a statistics poster is a display containing two or more related graphics that summarize a set of data, look at the data from different points of view, and answer specific questions about the data. The competition is open to all K-12 students in Pennsylvania. The

winning posters from the Pennsylvania Competition are submitted to the National Statistics Poster Competition. Attendance: over 500 posters. Hosted since 2008.

- My role: co-director.
- *SFU Merit Badge Workshop*, merit badge workshops for boy scouts of America is a collaborative effort between the Outreach Center and faculty at SFU. Five-seven badges are offered during a day-long workshop. Attendance: 100 boy scouts. Hosted since 2013.
 - My role: coordinator and instructor.

PREVIOUS OUREACH EXPERIENCE AND PROGRAMS

- *Science Quest*, a series of family events oriented toward middle- and high- school children and their parents; includes brief talks on concepts in science followed by watching a sci-fi film *The Quantum Quest: A Cassini Odyssey* includes tours of the MU Nuclear Research Reactor and science labs in the University. Attendance: 1000 participants.
 - My role: organizing the event (from conceiving the idea to its full implementation): finding monetary funds, negotiation with the movie production company, negotiating the movie producer, negotiating with the local movie theater, proposing the program to the school board, organizing the field trips for the school children, organizing the trips for after school clubs, organizing the trips for college students, working with guest speakers, organizing the tours to the reactor;
- *Reaching to the Star*, a solar-viewing program that allows to the general public to look at and study visible features of the Sun's surface, since 2013. Attendance: on average 80 viewers, bi-weekly event.
 - My role: initiated and organized the program, pursued funding for the acquisition of a portable solar telescope. The telescope is taken to different locations on the University's campus where passers-by are offered an opportunity to look at the Sun through a special filter. The participants receive small booklets with more detailed information on the Sun and the features they just observed;
- Volunteer at Laws observatory for our weekly public outreach sky viewing program, since 2007. Attendance: on average 50 visitors per night; a weekly event.
 - My role: operating a telescope, explaining to the public what they see in the sky, explaining basic laws of physics and concepts in astronomy;
- Volunteer and presenter for visiting elementary, middle and high school students from Columbia and nearby towns on their field trips to the observatory, since 2007. Attendance: varies, about 20 groups per year from 10 to 80 participants.
 - My role: demonstrating how the Celestial Sphere works, teaching children how to find stars and constellations, explaining the motion of the stars and Earth, teaching the reasons for seasons, moon phases and eclipses; organizing educational games and creating learning materials;
- Volunteer and presenter for visiting local boy scouts and girl scouts organizations at Laws observatory, since 2007. Attendance: 3 - 4 groups of 20-30 scouts per year.
 - Teaching how to find stars and constellations in the sky, basics of nautical navigation using the stars, explaining basic laws of physics and concepts in astronomy;
- Astronomy observatory facilitator for *A Time for Physics First*, an NSF funded program. Volunteer at Laws observatory (Physics building - MU) during school field trips. Attendance: 60 teachers per summer.
 - Demonstrating how to use binoculars to find deep space objects, how to observe planets and the Moon;
- Initiated and organized *Sky Tonight*: weekly public talks on constellations (presenter: Val German of Central Missouri Astronomical Association), 2008. Attendance: 20-50 participants
 - These talks are oriented towards the students and the general public to introduce what is new in the sky, connection between ancient Greek mythology and the contemporary sky;

- Organizer of two DMC campus festivals, 2005 and 2006. Attendance: over 1000 each festival
 - The festivals promoted computer-based technology for formal and informal learning: learning virtual environments (Second Life, Wonderland, and more) and popular computer games (SimCity, Star Wars, and more).

STEM CAMPS TAUGHT

- Space Camp. Grades 7-9. In this camp, children learn constellations, stars and the nature of light. The campers investigate the basic properties of light and the way light interacts with matter. During this one-week long camp children progress from discovering why we see rainbows, a blue sky, and green grass to figuring out the chemical composition of distant stars. Among the activities offered in this camp, children conduct experiments to investigate fundamental properties of light, conduct solar observations of the nearest to us star (the Sun), and compare it to other stars in constellations. In addition, children discuss solar activity and its effect on our everyday life on Earth. This camp is designed to introduce children to a wide range of concepts and laws in astronomy, physics, chemistry, biology, and Earth sciences. 2015 – present
- 3D Printing Camp. Grades 4-6 and 7-9. In this camp students gain experience in modeling 3D objects using Tinkercad, Autodesk 123D, Sculpt3D, and Meshmixer computer software. By the end of the camp, students bring their creations to life using 3D printers. During our camp students discover that the only limit to what can be printed is the limit of imagination. 2015 – present

INVITED TALKS

- A number of talks on the structure of our solar system given to students in elementary, middle and high schools in Blair, Cambria, and Somerset counties.
- A number of public talks given during *Cosmic Treats*, a community science outreach program.
- “The Universe on Your Computer”, a public talk given during *Cosmic Conversations*, a series of science talks organized by the department of Physics and Astronomy for the general public, spring 2014.
- “Small Bodies in the Solar System”, a public talk organized by the *Student Astronomical Society*, fall 2013.
- “Women in Astronomy”, a public talk given during *Cosmic Conversations*, a series of science talks organized by the department of Physics and Astronomy for the general public, fall 2013.
- “Stars in the Dark Sky”, a public talk organized by the *Student Astronomical Society*, fall 2012.
- “The Moon and Its Phases”, two talks presented to high school students at Rockbridge High School, fall 2010.
- “From Greeks to the Copernican Revolution”, “Solar System”, “Stellar Evolution”, and “Big Bang”, invited lecture series for the *Warm Little Planet* honors college course, winter 2010.
- “Birth of a Star”, presented to *Missouri Scholars Academy* (an intensive, residential three-week program for gifted high school students from all over the state of Missouri), summer 2008.

SYNERGISTIC ACTIVITIES

- Instructor of astronomy courses for the Upward Bound program at Saint Francis University, 2017 – present.
- Advisor of the student organization *SFU-S.T.A.R.S.* at Saint Francis University, 2014 – present.
- Collaborated on and published a textbook for an introductory astronomy course: *Astronomy! A conceptual introduction from the Big Bang to that asteroid heading right for us*, 2014-2015.
- Founded Student Astronomical Society (S.A.S), 92 members, MU student organization, 2010.

- Organized and presided over Digital Media Club (DMC), 56 members, MU student organization, for supporting use of technologies on campus, 2004-2006.
- Organized and presided over Avatar 3D, 18 members, MU student organization, for supporting 3D modeling and creating and utilizing 3D virtual environments, 2006-2007.
- Graduate Education Counsel, College of Education, University of Missouri, graduate students' representative, 2007-2008.
- Developer of animations and a computer simulation for MU astronomy courses, since 2007.

HONORS

- Mizzou Advantage/Preparing Future Faculty postdoctoral teaching fellowship, 2011.
- Excellence in Teaching award, 2008
Department of Physics and Astronomy, University of Missouri.
- Chambliss Astronomy Achievement Student Awards, honorable mention, 2008
American Astronomical Society, 212th meeting, St. Louis, MO.

COLLABORATORS

Prof. John Harris (Saint Francis University), Prof. Dan Wetklow (Saint Francis University), Prof. Lane Loya (Saint Francis University), Prof. Gail Drus (Saint Francis University), Prof. Julie LaBar (Saint Francis University), Prof. A. Speck (University of Missouri, MO), Prof. W. Montfroiij (University of Missouri, MO), Prof. M. Chandrasekhar (University of Missouri, MO), Prof. D. Kosztin (University of Missouri, MO), Prof. D. Nickelson (William Woods University, MO), Prof. R. French (Mira Costa College, CA), Prof. J. Moore (University of Missouri, MO), Dr. H. Tsai (University of Missouri, MO)

GRADUATE AND POSTDOC ADVISORS

- Postdoc: C. Klein Lapierre, Ph.D., Professor of Engineering (Office of the Provost, Mizzou Advantage, MU)
- Ph.D.: A. Speck, Ph.D. (Department of Physics and Astronomy, MU)
- Ph.D.: J. Laffey, Ph.D. (School of Information Science and Learning Technologies MU)
- ED.S.: J. Laffey, Ph.D. (School of Information Science and Learning Technologies, MU)
- M.A.: F. Cropp, Ph.D. (School of Journalism, MU)

PROFESSIONAL AFFILIATIONS

- Museum Alliance – NASA, 2015 – present
- AAS - American Astronomical Society, 2007 – present
- ASP - Astronomical Society of the Pacific, 2007 – present
- AACE - Association for the Advancement of Computing in Education, 2006 – present
- CMAA - Central Missouri Astronomical Association, 2006 – present
- MMUG - Missouri Macromedia User Group, 2004 – 2008
- Graduate Education Counsel at the University of Missouri, 2003 – 2010
- Member of Graduate Education Counsel at the University of Missouri, 2009-2010