

MATTHEW P. WIESNER, PhD

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CURRENT POSITION

Assistant Professor of Physics and Engineering at Benedictine University (2016-present)

EDUCATION

2014 **Doctor of Philosophy** in Physics, Northern Illinois University

Dissertation title: *Investigations of Galaxy Clusters Using Gravitational Lensing*

Advisors: Dr. Huan Lin (Fermilab) and Dr. Michael Fortner (Northern Illinois University)

2010 **Master of Science** in Physics, Northern Illinois University,
2010

Thesis title: *On the Properties of Ten Strong-Lensing Systems Found in the Sloan Digital Sky Survey*

2007 Illinois **secondary teacher licensure** in physics, license number 2078099

2007 **Master of Arts** in Educational Policy and Leadership,
Marquette University

Capstone essay title: *A Superpower and a Democracy: Why and How We Need to Teach Science Better*

2003 **Bachelor of Science** in Physics, Marquette University

POSTDOCTORAL EXPERIENCE

Postdoctoral Researcher, Purdue University, July 2014—June 2016

- Conducted independent research into strong and weak gravitational lensing
- Performed service tasks and analyses for the Large Synoptic Survey Telescope Dark Energy Science Collaboration
- Created new outreach program, “Saturday Morning Astrophysics at Purdue”

COURSES TAUGHT

At Benedictine University:

- **Physics 1101**—Physical Science
- **Physics 1106**—Astronomy

- **Physics 1107**—Earth and Space Science
- **Physics 1113**—College Physics
- **Physics 1114**—College Physics 1 Lab
- **Physics 1118**—College Physics 2
- **Physics 1119**—College Physics 2 Lab
- **Physics 2220**—Statics
- **Engr 3221**—Dynamics
- **Physics 4340**—Electricity and Magnetism
- **Physics 4398**—Undergraduate research

At Northern Illinois University:

- **Physics 162**—Elementary Astronomy
- **Undergraduate physics laboratories**

At Marquette University:

- **Physics 002**—Introductory Physics 2
- **Undergraduate physics laboratories**
- **Integrated Science** at Marquette University Upward Bound

At Carroll University:

- **Physics 105**—Introductory Astronomy
- **Physics 102**—Introductory Physics 2
- **Physics 204**—Introductory Calculus-Based Physics 2

High School Teaching:

- **Conceptual Physics and Introductory Biology** at Milwaukee Academy of Science High School, Fall and Spring 2007-2008
- **Pre-IB Physics and Chemistry** (student teaching) at Rufus King International Baccalaureate High School, Fall 2006

HONORS AND ACTIVITIES

- Received 2020 College of Science **Dean's Award for Research** from the College of Science at Benedictine University.
- Received 2016 **Engagement Award** from the Purdue University College of Science. This award recognized my establishment of and participation in the Saturday Morning Astrophysics at Purdue program.
- Received **Outstanding Graduate Teaching Assistant Award** from Northern Illinois University Center for Faculty Development, April 2013
- Awarded **Dissertation Completion Fellowship** by Northern Illinois University Graduate School, 2013-2014 Academic Year
- Awarded **Second Place Prize** in Sigma Xi Graduate Student Research Poster Competition, Spring 2012 at Northern Illinois University

- Awarded **First Prize** in Sigma Xi Graduate Student Research Presentation Competition, Spring 2011 at Northern Illinois University
- Received **Best Teaching Assistant Award** from Northern Illinois University Department of Physics, April 2010
- Nominated twice for University-wide **Best Teaching Assistant** Award, Spring 2010 and Spring 2011 at Northern Illinois University
- Served as **Physics Graduate Student Committee Colloquium Chair** at Northern Illinois University, Fall 2009, bringing two speakers to campus

PAPERS IN ASTROPHYSICS

- Tucker, D., Wiesner, M., et al. “SOAR/Goodman Spectroscopic Assessment of Candidate Counterparts of the LIGO-Virgo Event GW190814.” In internal review.
- Abolfathi, B., Alonso, D.,...Wiesner, M., et al. “The LSST DESC DC2 Simulated Sky Survey.” Accepted by the *Astrophysical Journal Supplements*, Dec. 2020.
- “Constraints on the Physical Properties of S190814bv through Simulations based on DECam Follow-up Observations by the Dark Energy Survey,” R. Morgan, M. Wiesner, et al., *The Astrophysical Journal*, 901 (2020), 1, 83.
- “A DESGW Search for the Electromagnetic Counterpart to the LIGO/Virgo Gravitational Wave Binary Neutron Star Merger Candidate S190510g,” A. Garcia,...M. Wiesner, et al., <https://arxiv.org/abs/2007.00050>.
- Y. AlSaiyad, H. Awan, C. Burke, J. Cheng, J. Chiang, S. F. Daniel, S. Digel, R. Dubois, E. Gawiser, T. Glanzman, M. Jarvis, T. Johnson, H. Kelly, D. Kirkby, S. Krughoff, R. H. Lupton, R. Mandelbaum, P. J. Marshall, M. Mustafa, E.-H. Peng, J. Peterson, P. Price, G. Sembroski, A. Slosar, J. Sanchez, B. Van Klaveren, C. W. Walter, **M. Wiesner**, W. M. Wood-Vasey, B. Xin, The LSST Dark Energy Science Collaboration, “The LSST DESC Data Challenge 1: Generation and Analysis of Synthetic Images for Next Generation Surveys,” *Monthly Notices of the Royal Astronomical Society*, Volume 497, Issue 1, September 2020, Pages 210–228.
- Jun Cheng, **Matthew P. Wiesner**, En-Hsin Peng, Wei Cui, John Peterson, and Guoliang Li, “Adaptive Grid Lens Modeling of the Cosmic Horseshoe Using Hubble Space Telescope Imaging,” 2019, *The Astrophysical Journal*, 872, 185.
- **Matthew P. Wiesner**, Huan Lin and Marcelle Soares-Santos. “Mass Calibration of Galaxy Clusters at Redshift 0.1-1.0 using Weak Lensing in the Sloan Digital Sky Survey Stripe 82 Co-add.” *Monthly Notices of the Royal Astronomical Society*, 452 (1): 701-714, 2015 September 1.
- Diehl, H.T., Abbott, T.M.C., Annis, J., Armstrong, R., Baruah, L., Bermeo, A., Bernstein, G., Beynon, E., Bruderer, C., Buckley-Geer, E.J., Campbell, H., Capozzi, D., Carter, M., Casas, R., Clerkin, L., Covarrubias, R., Cunha, C., D'Andrea, C., Da Costa, L., Das, R., Depoy, D.L., Dietrich, J., Drlica-Wagner, A., Elliott, A., Eifler, T., Estrada, J., Etherington, J., Flaugher, B.L., Frieman, J., Fausti Neto, A., Gelman, M., Gerdes, D., Gruen, D., Gruendl, R., Hao, J., Head, H., Hellsby, J., Hoffman, K., Honscheid, K., James, D., Johnson, M., Kacprzac, T., Katsaros, J., Kennedy, R., Kent, S., Kessler, R., Kim, A., Krause, E., Kron, R., Kuhlmann, S., Kunder, A., Li,

T., Lin, H., Maccrann, N., March, M., Marshall, J., Neilsen, E., Nugent, P., Martini, P., Melchior, P., Menanteau, F., Nichol, R.C., Nord, B., Ogando, R., Old, L., Papadopoulos, A., Patton, K., Petravick, D., Plazas, A.A., Poulton, R., Pujol, A., Reil, K., Rigby, T., Romer, A., Roodman, A., Rooney, P., Sanchez Alvaro, E., Serrano, S., Sheldon, E., Smith, A., Smith, R.C., Soares-Santos, M., Soumagnac, M., Spinka, H., Suchyta, E., Tucker, D., Walker, A.R., Wester, W., **Wiesner, M.**, Wilcox, H., Williams, R., Yanny, B., Zhang, Y.-Y., “The Dark Energy Survey and Operations: Year 1,” *Proceedings of SPIE - The International Society for Optical Engineering*, volume 9149, id 91490V, 2014.

- **Matthew P. Wiesner**, Huan Lin, Sahar S. Allam, James Annis, Elizabeth Buckley-Geer, H. Thomas Diehl, Donna Kubik, Jeffrey Kubo and Douglas Tucker. “The Sloan Bright Arcs Survey: Ten Strong Gravitational Lensing Clusters and Evidence of Overconcentration.” *The Astrophysical Journal*, 761:1, 2012 December 10.
- Jeffrey M. Kubo, Sahar S. Allam, Emily Drabek, Huan Lin, Douglas Tucker, Elizabeth J. Buckley-Geer, H. Thomas Diehl, Marcelle Soares-Santos, Jiangang Hao, **Matthew Wiesner**, Anderson West, Donna Kubik, James Annis and Joshua A. Frieman. “The Sloan Bright Arcs Survey: Discovery of Seven New Strongly Lensed Galaxies Between $z=0.66-2.94$.” *Astrophysical Journal Letters* 724 (2010) L137-L142.
- Victor E. Scarpine, Steven M. Kent, Susana E. Deustua, Michael J. Sholl, Stuart L. Mufson, Melanie N. Ott, **Matthew Wiesner**, Brian J. Baptista, “The ring of fire: an internal illumination system for detector sensitivity and filter bandpass characterization.” *Proceedings of SPIE 7731, Space Telescopes and Instrumentation 2010: Optical, Infrared, and Millimeter Wave*, 77313E (11 August 2010); doi: [10.1117/12.857695](https://doi.org/10.1117/12.857695)

PAPERS IN EDUCATION AND PHILOSOPHY OF SCIENCE

- **Matthew P. Wiesner**, “Book Review: The Realist Guide to Religion and Science,” *Theology and Science*, Volume 18, Issue 3, July 2020.
- **Matthew P. Wiesner**, David Sederberg and Rafael Lang, “Simulating a Dark Matter Detector in a Physics Classroom.” *The Physics Teacher*, **58**, 108, 2020.
- **Matthew P. Wiesner**, “Does the Universe Revolve Around Me? A Critical Review of the Geocentrism Documentary *The Principle*.” *Skeptical Inquirer*, July/August 2016.
- **Matthew P. Wiesner**, “Learning from the Starry Message: Using Galileo’s *Sidereus Nuncius* in Introductory Astronomy Classes.” *The Physics Teacher*, May 2015.
- **Matthew P. Wiesner**, “Modern Geocentrism: A Case Study of Pseudoscience in Astronomy.” *Skeptical Inquirer*, January/February 2015.

PRESENTATIONS

- **Matthew P. Wiesner**, “Eddington and Lemaître: Their Encounters, Their Science and Their Philosophies,” talk at “Arthur S. Eddington From Physics to Philosophy and Back Again,” Paris, May 27, 2019.

- **Matthew P. Wiesner**, “Measurement Through Distortion: Gravitational Lensing as a Fundamental Tool of Cosmology.” Talk at Super-PAC Early Career Workshop in Philosophy of Astrophysics and Cosmology, October 29, 2017.
- **Matthew P. Wiesner**, “One Survey to Rule Them All: Preparing to Do Astrophysics in the Age of the Large Synoptic Survey Telescope.” Colloquium at Northern Illinois University Department of Physics, October 28, 2016.
- **Matthew P. Wiesner**, “Mass Calibration of Galaxy Clusters Found in the Sloan Digital Sky Survey Stripe 82 Co-add.” Astrophysics Seminar given at Purdue University, April 18, 2016.
- **Matthew P. Wiesner** and David Sederberg, “Saturday Morning Astrophysics at Purdue: Sharing Astrophysics with the Indiana Community”, contributed talk presented at American Association of Physics Teachers 2016 winter meeting, January 2016.
- **Matthew P. Wiesner** and David Sederberg, “Saturday Morning Astrophysics at Purdue: A New Outreach Program in Astronomy”, poster presented at American Association of Physics Teachers 2016 winter meeting, January 2016.
- **Matthew P. Wiesner**, “Studies of Astrometry Using PhoSim”, LSST Dark Energy Science Collaboration Meeting, October 2015.
- **Matthew P. Wiesner**, “Analysis of Astrometric Corrections for Atmospheric Effects using PhoSim”, LSST Dark Energy Science Collaboration Meeting, February 2015.
- **Matthew P. Wiesner**, Huan Lin, Marcelle Soares-Santos. “Investigations of Galaxy Clusters Using Gravitational Lensing.” Dissertation Talk presented at American Astronomical Society conference, January 2014.
- **Matthew P. Wiesner**, Huan Lin. “How Many Galaxies? Checking the Accuracy of a Method for Extrapolating Galaxy Cluster Richness.” Presentation at New Perspectives conference, part of 2013 Fermilab Users’ Meeting.
- **Matthew P. Wiesner**, Huan Lin, Elizabeth Buckley-Geer, James Annis, Sahar Allam, Jeffrey Kubo, H. Thomas Diehl, Douglas Tucker, Donna Kubik. “Are Galaxy Clusters Overconcentrated?” Poster presentation at American Astronomical Society conference, January 2012.
- **Matthew P. Wiesner**, Huan Lin, Elizabeth Buckley-Geer, James Annis, Sahar Allam, Jeffrey Kubo, H. Thomas Diehl, Douglas Tucker, Donna Kubik. “Clusters and Lenses: Analyzing Ten Gravitational Lensing Systems Discovered in the Sloan Digital Sky Survey.” Talk presented at New Perspectives conference, part of 2011 Fermilab Users’ Meeting.
- **Matthew P. Wiesner**, Huan Lin, Elizabeth Buckley-Geer, James Annis, Sahar Allam, Jeffrey Kubo, H. Thomas Diehl, Douglas Tucker, Donna Kubik. “Clusters and Lenses: Ten Galaxy Clusters Exhibiting Strong Lensing Found in the Sloan

Digital Sky Survey.” Poster presentation at American Astronomical Society conference, January 2011.

- Huan Lin, Sahar Allam, Elizabeth Buckley-Geer, H. Thomas Diehl, Joshua Frieman, Jeffrey Kubo, Douglas Tucker, **Matthew Wiesner**, Sloan Bright Arcs Team. “SBAS: The Sloan Bright Arcs Survey.” Poster presentation at American Astronomical Society Conference, January 2011.
- **Matthew Wiesner**, Huan Lin, Elizabeth Buckley-Geer, James Annis, Sahar Allam, Jeffrey Kubo, H. Thomas Diehl, Douglas Tucker, Donna Kubik, “Studying the Properties of Distant Galaxies Using a Sample of Strong Lenses from the Sloan Digital Sky Survey.” Poster presentation at Great Lakes Cosmology Conference, June 2010.
- **Matthew P. Wiesner**, Victor E. Scarpine, Stephen M. Kent, Robert D. Angstadt, Susana E. Deustua, Michael J. Sholl, Melanie N. Ott, Stuart L. Mufson, Brian J. Baptista, “The Ring of Fire: Testing an Internal Illumination System for the Joint Dark Energy Mission.” Poster presentation at 2010 Fermilab User’s Meeting.
- Emily Drabek, Elizabeth Buckley-Geer, Huan Lin, Sahar Allam, Jeffrey Kubo, H. Thomas Diehl, Douglas Tucker, Donna Kubik, James Annis, **Matthew Wiesner**, “Spectroscopy of two strong lensing clusters.” Poster presented at 2010 Fermilab User’s Meeting and summer 2010 American Astronomical Society meeting.
- **Matthew P. Wiesner**, “Writing to Comprehend and Inspire in Introductory Astronomy Laboratories.” Talk presented at winter 2009 conference of American Association of Physics Teachers.
- **Matthew P. Wiesner** and Melissa A. Vigil, “Writing to Learn in Post-Secondary, Calculus-Based Physics Laboratories.” Talk presented at summer 2006 conference of American Association of Physics Teachers.
- Melissa A. Vigil and **Matthew P. Wiesner**, “Learning Writing to Learn: Training for Undergraduate Physics Lab Teaching-Assistants.” Talk presented at summer 2006 conference of American Association of Physics Teachers.

RELATED POSITIONS HELD

- Assistant Professor, Benedictine University, August 2016—present
 - Taught three-five classes each semester including College Physics, Astronomy, Statics, Dynamics and Electricity and Magnetism
 - Developed curriculum and learning activities
 - Guided students in understanding of physics concepts
 - Advised Learning Assistants in physics and pedagogical techniques
 - Continued involvement with Large Synoptic Survey Telescope Dark Energy Science Collaboration
 - Assisted Astronomy Club in use of telescopes and Club development

- Postdoctoral Researcher, Purdue University, July 2014—June 2016
 - Conducted independent research into strong and weak gravitational lensing
 - Performed service tasks and analyses for the Large Synoptic Survey Telescope Dark Energy Science Collaboration
 - Created new outreach program, “Saturday Morning Astrophysics at Purdue”
- Observatory Manager, Northern Illinois University, July 2009—May 2014
 - Provided guided tours to students and community members
 - Arranged special tours for Cub Scouts, school groups and more
 - Maintained and improved Observatory equipment
 - Obtained grants to fund Observatory improvements
 - Designed and advertised Observatory outreach events including observing a lunar eclipse (2010) and the transit of Venus (2012)
 - Yearly attendance at the NIU Observatory is about 1500 people
- Course Instructor, Northern Illinois University, 2009-2014
 - Taught introductory astronomy in a large lecture (at times more than 100 students)
 - Created lecture demonstrations, class activities, study guides and assessments
 - Provided extra help to students who struggled with course material
- Laboratory Instructor, Northern Illinois University, 2008—2011
 - Taught 1-2 undergraduate physics laboratories in both electricity and magnetism and mechanics
 - Tutored students in all levels of introductory physics
 - Graded weekly homework for large lecture course
- Research Assistant, Experimental Astrophysics Group, Fermi National Accelerator Laboratory, summer 2009
 - Set up and tested flat fielding device for Joint Dark Energy Mission
 - Worked independently to assemble components and integrate their functionalities
 - Designed and implemented software to run devices
 - Reported results of tests to supervisors
- Science Teacher, Milwaukee Academy of Science High School—2007-2008
 - Led freshmen through senior-level students in laboratory-based physics and biology in an urban school
 - Created and implemented hands-on learning experiences in science
 - Provided after-school tutoring to students in need of academic support
 - Directed students in school choir
- Science Teacher, Marquette University Upward Bound—summers 2005-2007
 - Taught physics to freshman high school students in an urban environment in the context of a hands-on Rube Goldberg project (summer 2006 and 2007)
 - Designed and implemented hands-on science labs
 - Cooperated with teaching team to integrate science with English, math and technology curricula
 - Tutored high school students in physics, mathematics and reading (spring and summer 2005)

- Adjunct Instructor, Marquette University—2005-2006
 - Led 80-90 college students in the completion of introductory physics laboratory experiments relating to motion, force, optics, electricity and magnetism
 - Researched effectiveness of experimental writing-to-learn laboratory curriculum
 - Provided extensive tutoring support to students in all introductory physics courses

SERVICE

- Chair of Membership Committee for Legacy Survey of Space and Time Dark Energy Science Collaboration (2020)
- Ongoing service as referee for *The Physics Teacher*
- Participated in review of Indiana Department of Education state science standards
- Arranged astrophysics seminar and special interdisciplinary seminar by Dr. Stephen Kent at Purdue University, April 13, 2015
- Designed new curricula for Honors Astronomy at Northern Illinois University, 2012
- Served as Graduate Student Association colloquium chair at Northern Illinois University from 2009-2010, arranging talks by Dr. Michael Turner, Dr. Jorge Cham and others
- Created and advised student choir at Milwaukee Academy of Science, 2008

MENTORING

- Mentored 6 undergraduate students in astrophysics research at Benedictine University
- Advised graduate student Jun Cheng in strong and weak lensing and other studies related to LSST at Purdue University (2014-2016)
- Trained undergraduate student Gabriel Almonte in astronomy outreach and development of new electronic circuits at Purdue University, spring 2016
- Trained new graduate students Daniel Stange and Melissa Butner in how to manage the NIU Observatory and all of its outreach efforts (2014)
- Led students in Honors Astronomy in taking astronomical images and analyzing them (2013)
- Trained high school student volunteer at NIU Observatory in observing skills and in presentation of astronomy (2012)

OUTREACH

- Developed Benedictine Astronomy Outreach at Benedictine University, offering occasional introductions to the night sky to the community
- Created “Saturday Morning Astrophysics” program at Purdue University for students in grades 7-12 in local schools. This program is offered every second Saturday throughout the year. I teach about a topic of interest in modern astrophysics and lead students in a related activity. I also recruited other scientists to help teach this program and developed a continuity plan for it to continue after my departure.

- Presented hands-on lesson on telescopes to second graders in College Mentors for Kids program at Purdue University, April 14, 2016
- Taught lessons on telescopes and constellations for students in St. Michael Homeschool coop, February 1 and February 29, 2016
- Introduced a pack of American Heritage Girls (ages 8-11) to the constellations and the career of astronomer
- Gave talk on the Large Synoptic Survey Telescope project to teachers participating in Purdue QuarkNet program, June 24, 2015
- Presented “10 Awesome Things You Didn’t Know About Astronomy” to AP Physics class at William Henry Harrison High School in West Lafayette, April 28, 2015
- Presented astronomy lesson on telescopes and the night sky to second grade children participating in Purdue College Mentors for Kids, April 22, 2015
- Presented to 300 elementary school children “How to Become an Astronomer” at Cumberland Elementary School Elementary Career Fair, November 21, 2014
- Presented “Celebrate the April 2014 Total Lunar Eclipse” at Northern Illinois University, April 14-15, 2015. Event consisted of an introduction to eclipses and an introduction to the night sky for the NIU and DeKalb communities. Then open observing of the eclipse was made available to everyone from 9:30pm-6:00am.
- Presented talk “A Brief History of Space Travel” at NIU Teen Read event on Ender’s Game, November 6, 2013
- Designed and led telescope and astronomy exhibit at STEMfest science festival and Haunted Physics Lab in October for 5 consecutive years. This exhibit included telescopes demonstrated by student volunteers, astronomical images and games and “Astro Jeopardy”. Visitors highly rate this booth every year.
- Spoke to about 200 people at Acquaviva Winery about the night sky and currently visible constellations at NIU STEM Outreach Perseid Meteor shower event, August 11, 2013
- Presented talk entitled “Calling All Comets” July 19, 2013, introducing 40 people in attendance to the bright comets of 2013
- Judged middle school science projects at school science fair at St. Mary School, DeKalb, IL, 2008 and 2013
- Judged middle school science fair projects at Clinton Rosette Middle School, DeKalb, IL, February 2012 and February 2013
- Demonstrated use of telescopes and introduced the night sky to 40 Cub Scouts and family members at an Illinois State Park, September 2012
- Led group of about 300 community members in viewing transit of Venus, June 5, 2012 at NIU Observatory
- Spoke to men’s group at Sycamore Methodist Church on “10 Amazing Things You Might Not Know About Astronomy”, May 10, 2012
- Presented “Learn the Spring Constellations at NIU!” public event in April 2012, attended by about 70 people
- Hosted “Mars Night at NIU” public event, March 2012
- Hosted “Learn the Fall Constellations at NIU!” public event in November 2011, attended by about 100 people
- Participated in Teen Read book discussion on *Orbiter* and the space shuttle program, October 18, 2011, at NIU

- Presented talk entitled “Bon Voyage to the Space Shuttle” marking the completion of the Space Shuttle program, June 29, 2011 at NIU
- Invited to speak on NIU Observatory at DeKalb Kiwanis Club, May 2011
- Invited to speak on DeKalb, Illinois, radio station 1360 WLBK regarding LCROSS crash into Moon, October 2009

COMMUNITY INVOLVEMENT

- Coached West Lafayette Little League junior softball team, summer of 2016
- Coached West Lafayette Little League junior baseball team, summer of 2015
- Performed with ensemble vocal group *Aureus Manus*, West Lafayette, Indiana, 2015
- Coached AYSO soccer team in Dekalb Illinois, fall of 2013
- Assisted in establishment of new Cub Scout pack in Oak Park, Illinois and led the pack in astronomy activities
- Performed with Fermilab Singers 2013-2014
- Participated in Fermilab softball league, playing for the Big Bangers astrophysics group team 2010-2013

GRANTS

- Obtained \$1000 grant for NIU Observatory from NIU Committee for the Improvement of Undergraduate Education, Spring 2012
- Obtained \$1000 grant for NIU Observatory from NIU Committee for the Improvement of Undergraduate Education, Spring 2011
- Received travel grant from University of Chicago Department of Physics to attend Chandrasekhar Memorial Conference, October 2010

PROFESSIONAL MEMBERSHIPS

- Large Synoptic Survey Telescope, Dark Energy Science Collaboration
- American Astronomical Society
- American Physical Society