

Kara A. Ponder

Curriculum Vitae

Berkeley Center for Cosmological Physics
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RESEARCH INTERESTS

Dark Energy, Supernova Cosmology, Statistical Methods, Artificial Intelligence.

Employment

Sept 2017– **Berkeley Center for Cosmological Physics Computational Data Science Fellow**, *Department of Physics*, University of California, Berkeley.

Education

- 2012–2017 **Ph.D. Physics**, *Department of Physics and Astronomy*, University of Pittsburgh, Pittsburgh, PA, USA.
Advisors: Professors Michael Wood-Vasey and Andrew Zentner
- 2012–2014 **M.S. Physics**, *Department of Physics and Astronomy*, University of Pittsburgh, Pittsburgh, PA, USA.
- 2009–2012 **B.S. Physics and Astronomy**, *Department of Physics and Astronomy*, University of Georgia, Athens, GA, USA.

AWARDS AND FELLOWSHIPS

- 2019 **LSST Dark Energy Science Collaboration (DESC) Travel grant.**
DESC Collaboration Meeting at APC, Paris, France
- 2017 **LSST Dark Energy Science Collaboration (DESC) Travel grant.**
DESC Collaboration Meeting at SLAC National Accelerator Laboratory, Menlo Park, CA
- 2016 **University of Pittsburgh School of Arts & Sciences Fellowship**, *For Fall 2016 and Summer 2017.*
Pitt PACC, Department of Physics and Astronomy - University of Pittsburgh
- 2016 **LSST DESC Travel grant.**
DESC Collaboration Meeting in Oxford, England, UK
- 2016 **Supernova Through the Ages: Understanding the Past to Prepare for the Future (SN2016) Conference Student Travel grant.**
SN2016 Conference, Easter Island, Chile
- 2016 **Pittsburgh Particle physics, Astrophysics, Cosmology Center Travel Grant**, SN2016 Conference, Easter Island, Chile.
Pitt PACC, Department of Physics and Astronomy - University of Pittsburgh
- 2016 **LSST DESC Travel grant.**
DESC Collaboration Meeting at SLAC National Accelerator Laboratory, Menlo Park, CA
- 2015 **Zaccheus Daniels Fellowship**, *For Summer 2016.*
Department of Physics and Astronomy - University of Pittsburgh
- 2014 **Department of Energy (DOE) Office of Science Graduate Student Research (SCGSR) Awardee.**
Department of Energy, Office of Science
- 2014 **Physics and Astronomy Departmental Fellowship**, *For Spring and partial Summer 2015.*
Department of Physics and Astronomy - University of Pittsburgh
- 2012 **Kenneth P. Dietrich School of Arts & Sciences Fellowship**, *For Spring and Summer 2013.*
Kenneth P. Dietrich School of Arts & Sciences - University of Pittsburgh
- 2012 **Physics and Astronomy Award.**
Department of Physics and Astronomy - University of Georgia
- 2011 **Linville L. Hendren Memorial Scholarship for Outstanding Proficiency in Physics.**
Department of Physics and Astronomy - University of Georgia

COLLABORATIONS

- Aug 2019 - **COIN: Cosmostatistics Initiative.**
- Sept 2017 - **The Nearby Supernova Factory.**
- March 2014 - **Large Synoptic Survey Telescope Dark Energy Science Collaboration (LSST DESC).**
Member of Supernova Working Group
Member of Collaboration Council: November 2015-2017, 2018-2020
- Feb 2014 - **Sloan Digital Sky Survey (SDSS) III and IV.**
2017 SDSS III replaced by SDSS IV in June 2014
Officially Joined SDSS IV in March 2016

Accepted Proposals

- 2019-2020 **Hubble Space Telescope**, 51 Orbits in Cycle 27.
Supernovae in the Infrared avec Hubble (SIRAH)
PI: Saurabh Jha, Col: KAP
- 2019-2020 **Hubble Space Telescope**, Snapshot.
Confirming Strong Galaxy Gravitational Lenses in the DESI Legacy Imaging Surveys
PI: Xiaosheng Huang, Col: KAP
- Spring/Summer 2017 **VLT 8.2 m**, 99 hours in Period 99, Multi Unit Spectroscopic Explorer (MUSE): Optical IFS.
All-weather MUSE Supernova Integral field Nearby Galaxies (AMUSING) survey IV
PI: Lluís Galbany, Col: KAP
- Fall 2016 **VLT 8.2 m**, 45 hours in Period 98, Multi Unit Spectroscopic Explorer (MUSE): Optical IFS.
All-weather MUSE Supernova Integral field Nearby Galaxies (AMUSING) survey IV
PI: Lluís Galbany, Col: KAP
- Fall 2016 **Calar Alto 3.5 m**, Backup targets in service mode, Potsdam MultiAperture Spectrophotometer (PMAS): Optical IFS.
PI: Lluís Galbany, Col: KAP
- Fall 2015 **WIYN 3.5 m**, 4 nights, Proposal ID: 2015B-0347, WHIRC: NIR imaging camera and HexPak: optical IFU mounted on bench spectrograph.
SweetSpot Survey
PI: W. Michael Wood-Vasey, Col: KAP

Experience

- Feb 2019- **Referee for Physics Review D.**
- Aug 2016-Aug 2017 **Co-President of the Association of Physics and Astronomy Graduate Students.**
Department of Physics and Astronomy, University of Pittsburgh

Observing

- Oct 2016 **Magellan 6.5 m**, 3 telescope nights, Low Dispersion Survey Spectrograph 3 (LDSS-3): Slit spectrograph in Optical and Folded-port InfraRed Echellette (FIRE): Echelle mode NIR spectrograph.
- Nov 2013 - May 2017 **WIYN 3.5 m**, 59.5 telescope nights, WHIRC: NIR imaging camera.
SweetSpot survey (PI: W. Michael Wood-Vasey, Col: KAP)
- Nov 2015 **WIYN 3.5 m**, 2 telescope nights, HexPak: integral field unit mounted on bench spectrograph.
SweetSpot survey follow up (PI: W. Michael Wood-Vasey, Col: KAP)
- May 2014 **Bok 2.3 m**, 4.5 telescope nights, 90prime: optical imaging camera.
Reverberation Mapping project in SDSS III

Additional Research

- Jan - June 2015 **Visiting student at the SLAC National Accelerator Laboratory.**
Funded through DOE SCGSR
- June - Aug 2011 **Research Experience for Undergraduates (REU)**, Purdue University.
Simulated different alignments to optimize the Very Energetic Radiation Imaging Telescope Array System (VERITAS)
Advisors: Professor John Finley and Dr. Glenn Sembroski

Jan - May 2011 **Undergraduate Researcher**, University of Georgia.
 Simulations of High Velocity Cloud Mixing with the Milky Way Halo
Advisor: Professor Robin Shelton
Publication from work: 'Mixing between High Velocity Clouds and the Galactic Halo'
 Gritton, Jeffrey A., Shelton, Robin L., Kwak, Kyujin, The Astrophysical Journal, Volume 795, Issue 1, article id. 99, 9 pp. (2014)

Organized Conferences

Feb 2019 **LSST DESC Winter Meeting**, LOC, Berkeley, CA.
 Feb 2019 **LSST DESC Broker Workshop**, LOC, Berkeley, CA.
 April 2018 **New advances in NIR type Ia supernova science**, SOC, Pittsburgh, PA.
 Nov 2016 **Preparing for SN science in the LSST era: A kick-off workshop**, LOC, Pittsburgh, PA.

Teaching

Aug - Dec 2012 **Teaching Assistant**, Department of Physics and Astronomy, University of Pittsburgh.
 Course: Astronomy 0089

CONFERENCES AND TALKS

Jan 2020 **"The Nearby Supernova Factory – Data and Science Overview"**, Kara Ponder for the Nearby Supernova Factory, Poster.
 American Astronomical Society Meeting 235, Honolulu, HI

Jan 2020 **"The Photometric LSST Astronomical Time Series Classification Challenge (PLAsTiCC): Final Results"**, Kara Ponder for the PLAsTiCC Team, Poster.
 American Astronomical Society Meeting 235, Honolulu, HI

Oct 2019 **"The Nearby Supernova Factory - Science and Data Overview"**, Contributed Plenary Talk.
 SNIa-Cosmology Analysis Meeting, University of Chicago, Chicago, IL

Jan 2019 **"Validating the PLAsTiCC Simulations"**, Kara Ponder for the PLAsTiCC Team, Contributed Talk.
 American Astronomical Society Meeting 233, Seattle, WA

Jan 2019 **"The Photometric LSST Astronomical Time Series Classification Challenge (PLAsTiCC)"**, Hlozek, R., Kessler, R., and 23 other authors including K. Ponder, Poster.
 American Astronomical Society Meeting 233, Seattle, WA

Jan 2019 **"Survey Statistics for the Nearby Supernova Factory Data Release"**, K. A. Ponder, Nearby Supernova Factory, Poster.
 American Astronomical Society Meeting 233, Seattle, WA

June 2018 **"The Nearby Supernova Factory: Efforts in Optimization and Visualization"**, Contributed Plenary Talk.
 Data Visualization and Exploration in the LSST Era, University of Illinois at Urbana-Champaign, IL

April 2018 **"SweetSpot Survey: Overview and Early Results"**, Invited Plenary Talk.
 New Advances in NIR type Ia Supernova Science Workshop, Pittsburgh, PA

March 2018 **"Are Type Ia Supernovae in Restframe H-band Brighter in More Massive Galaxies?"**, Invited Talk.
 Cosmology and Astronomy Seminar, UC Davis, Davis, CA

Feb 2018 **"Utilizing SweetSpot Host Galaxies for LSST"**, Contributed Talk.
 LSST DESC Collaboration Meeting, SLAC National Accelerator Lab, Menlo Park, CA

Nov 2016 **"Utilizing SweetSpot Host Galaxies for LSST"**, Contributed Plenary Talk.
 Preparing for SN science in the LSST era: A kick-off workshop, University of Pittsburgh, Pittsburgh, PA

Aug 2016 **"SweetSpot: A Near Infrared Survey of Type Ia Supernovae in the Nearby Hubble Flow"**, Contributed Plenary Talk.
 Supernova Through the Ages: Understanding the Past to Prepare for the Future, Easter Island, Chile

June 2015 **"SweetSpot: Data Release 1 and IFU Spectroscopy of 32 Host Galaxies"**, K. A. Ponder, W. M. Wood-Vasey, A. Weyant, L. Allen, P. M. Garnavich, S. W. Jha, R. R. Joyce, T. Matheson, A. Rest, Poster.
 American Astronomical Society Meeting 228, San Diego, CA

May 2016 **"SweetSpot: NOAO Near-Infrared Survey of Type Ia Supernovae in the Nearby Hubble Flow"**.
 NOAO FLASH talk, National Optical Astronomy Observatory, Tucson, AZ

- Aug 2015 **"SweetSpot Data Release 1: 70 Type Ia Supernovae in the Near Infrared in the Nearby Hubble Flow"**, K. A. Ponder, W. M. Wood-Vasey, A. Weyant, L. Allen, N. T. Barton, P. M. Garnavich, N. Jahan, S. W. Jha, R. R. Joyce, T. Matheson, A. Rest, Poster.
The iPTF Summer School, California Institute of Technology, Pasadena, CA
- July 2015 **"Accounting for Multiple Populations of Type Ia Supernovae"**, Contributed Talk.
Santa Fe Cosmology Workshops, St. John's College, Santa Fe, NM
- May 2015 **"Incorporating Astrophysical Systematics into a Generalized Likelihood"**, Invited Talk.
KIPAC Tea Talk, SLAC National Accelerator Lab, Menlo Park, CA
- March 2015 **"Incorporating Astrophysical Systematics into a Generalized Likelihood"**, Invited Talk.
Supernova at SLAC Meeting - SLAC National Accelerator Lab, Menlo Park, CA
- Feb 2015 **"Incorporating Astrophysical Systematics into a Generalized Likelihood"**, Contributed Talk.
LSST DESC Collaboration Meeting, SLAC National Accelerator Lab, Menlo Park, CA
- Jan 2015 **"SweetSpot Data Release 1: 70 Type Ia Supernovae in the Near Infrared in the Nearby Hubble Flow"**, Wood-Vasey, W. Michael; Weyant, Anja; Allen, Lori; Trevino Barton, Nathan; Garnavich, Peter M.; Farhin Jahan, Nabila; Jha, Saurabh; Kroboth, Jessica Rose; Ponder, Kara Ann; Joyce, Richard R.; Matheson, Thomas; Rest, Armin, Poster, Presented by W. Michael Wood-Vasey.
American Astronomical Society Meeting 225, Seattle, WA
- Oct 2014 **"Incorporating Astrophysical Systematics into a Generalized Likelihood"**, Invited Talk.
CMU Astrostatistics meeting, Carnegie Mellon University, Pittsburgh, PA
- June 2014 **"SweetSpot Data Release 1: 70 Type Ia Supernovae in the Near Infrared in the Nearby Hubble Flow"**, Wood-Vasey, W. Michael; Weyant, Anja; Allen, Lori; Garnavich, Peter M.; Jahan, Nabila; Jha, Saurabh; Ponder, Kara A; Joyce, Richard R.; Matheson, Thomas; Rest, Armin, Poster, Presented by W. Michael Wood-Vasey.
American Astronomical Society Meeting 224, Boston, MA
- April 2014 **"Incorporating Astrophysical Systematics into a Generalized Likelihood"**, Contributed Talk.
Neighborhood Workshop on Astrophysics and Cosmology. Pennsylvania State University, State College, PA
- Aug 2011 **"VERITAS Simulations"**, Contributed Talk.
REU Final Project Presentations - Purdue University, West Lafayette, IN
- May 2011 **"The Mixing of High Velocity Clouds"**, Invited Talk.
Undergraduate Award's Day Colloquium - University of Georgia, Athens, GA
- Public/Outreach Lectures**
- Sept 2019 **"Exploring Dark Energy with the Large Synoptic Survey Telescope"**.
Chabot Space and Science Center, Oakland, CA
- June 2019 **"Exploring Dark Energy through Supernova Cosmology"**.
Physics in and Through Cosmology, Lawrence Berkeley National Lab, Berkeley, CA
- Jan 2017 **"Exploring Dark Energy with the Large Synoptic Survey Telescope"**.
Allegheny Observatory Public Lecture Series, Pittsburgh, PA

PUBLICATIONS

- July 2016 **Ponder, K. A., Wood-Vasey, W.M., Zentner, A., "Incorporating Astrophysical Systematics into a Generalized Likelihood for Cosmology with Type Ia Supernova"**, The Astrophysical Journal, Volume 825, Issue 1, article id. 35, arXiv:1511.04647.
- Dec 2019 **Sloan Digital Sky Survey - Reverberation Mapping Project (34 authors including Kara A. Ponder), "The Sloan Digital Sky Survey Reverberation Mapping Project: Initial CIV Lag Results from Four Years of Data"**, The Astrophysical Journal, Volume 887, Issue 1, article id. 38, arXiv:1904.03199.
- Nov 2019 **Malz, A., Hložek, R., and 20 other authors including Ponder, K., LSST DESC, LSST TVS, "The Photometric LSST Astronomical Time-series Classification Challenge (PLAsTiCC): Selection of a performance metric for classification probabilities balancing diverse science goals"**, The Astronomical Journal, Volume 158, Issue 5, article id. 171, arXiv:1809.11145.
- Oct 2019 **Taubengerger, S., and 42 additional authors including Ponder, K. A., "SN 2012dn from early to late times: 09dc-like supernovae reassessed"**, Monthly Notices of the Royal Astronomical Society, Volume 488, Issue 4, p.5473-5488, arXiv:1907.06753.

- Sept 2019 **Kessler R., Narayan G., and 27 other individual authors including Ponder, K. A.**, “*Models and Simulations for the Photometric LSST Astronomical Time Series Classification Challenge (PLAsTiCC)*”, Publications of the Astronomical Society of the Pacific, Volume 131, Issue 1003, pp. 094501, arXiv:1903.11756.
- Sept 2019 **Sloan Digital Sky Survey - Reverberation Mapping Project (34 authors including Kara A. Ponder)**, “*The Sloan Digital Sky Survey Reverberation Mapping Project: Improving Lag Detection with an Extended Multiyear Baseline*”, The Astrophysical Journal Letters, Volume 883, Issue 1, article id. L14, arXiv:1908.00027.
- Aug 2019 **Holoien, T. W.-S., Huber, M. E., Shappee, B. J., and 35 other authors including Ponder, K.A.**, “*PS18kh: A New Tidal Disruption Event with a Non-Axisymmetric Accretion Disk*”, The Astrophysical Journal, Volume 880, Issue 2, article id. 120, 21 pp., arXiv:1808.02890.
- Oct 2018 **The PLAsTiCC team, LSST DESC, LSST TVS, and 22 individual authors including Ponder, K.**, “*The Photometric LSST Astronomical Time-series Classification Challenge (PLAsTiCC): Data set*”, arXiv:1810.00001.
- May 2018 **Weyant, A., Wood-Vasey W. M. , Joyce, R., Allen, L. , Garnavich, P. , Jha S.W., Kroboth, J.R., Matheson, T., Ponder, K.A.**, “*The First Data Release from SweetSpot: 74 Supernovae in 36 Nights on WIYN+WHIRC*”, The Astronomical Journal, Volume 155, Issue 5, article id. 201, arXiv:1703.02402.
- Feb 2018 **L. Galbany, J. P. Anderson, 17 more authors including K. A. Ponder**, “*PISCO: The Pmas/ppak Integral-field Supernova hosts COmpilation*”, The Astrophysical Journal, Volume 855, Issue 2, article id. 107, arXiv:1802.01589.
- Dec 2017 **Sloan Digital Sky Survey - Reverberation Mapping Project (39 authors including Kara A. Ponder)**, “*The Sloan Digital Sky Survey Reverberation Mapping Project: $H\alpha$ and $H\beta$ Reverberation Measurements From First-Year Spectroscopy and Photometry*”, The Astrophysical Journal, Volume 851, Issue 1, article id. 21, arXiv:1711.03114.
- Nov 2017 **Shivvers, I., Zheng. W., 25 more authors including Kara A. Ponder**, “*The Nearby Type Ibn Supernova 2015G: Signatures of Asymmetry and Progenitor Constraints*”, Monthly Notices of the Royal Astronomical Society, Volume 471, p. 4381–4397, arXiv:1704.04316.
- Aug 2017 **LSST Science Collaborations (104 authors including Kara A. Ponder)**, “*Science-Driven Optimization of the LSST Observing Strategy*”, arXiv:1708.04058.
- Nov 2016 **Galbany, L., D’Andrea, C., Prajs, S., Smith, M., Sullivan, M., Ponder, K., and 46 other authors**, “*Classification of DES16C2nm as a SLSN at $z=1.998$* ”, The Astronomer’s Telegram, Volume 9700.
- Jan 2015 **Sloan Digital Sky Survey III- Reverberation Mapping Project (39 authors including Kara Ponder)**, “*The Sloan Digital Sky Survey Reverberation Mapping Project: Technical Overview*”, Astrophysical Journal Supplement, Volume 216, Issue 1, article id. 4.

Abstracts

- Jan 2020 **Ponder, Kara for the Nearby Supernova Factory**, “*The Nearby Supernova Factory – Data and Science Overview*”, American Astronomical Society Meeting 235.
- Jan 2020 **Ponder, Kara for the PLAsTiCC Team**, “*The Photometric LSST Astronomical Time Series Classification Challenge (PLAsTiCC): Final Results*”, American Astronomical Society Meeting 235.
- Jan 2019 **Ponder K. A. for the PLAsTiCC Team**, “*Validating the PLAsTiCC Simulations*”, American Astronomical Society Meeting Abstracts 233.
- Jan 2019 **Ponder K. A. for the Nearby Supernova Factory**, “*Survey Statistics for the Nearby Supernova Factory Data Release*”, American Astronomical Society Meeting Abstracts 233.
- June 2016 **Ponder K. A., Wood-Vasey W. M. , Weyant A., Allen L., Garnavich P. M., Jha S.W., Joyce R. R., Matheson T., Rest A.**, “*IFU Spectroscopy of 32 SweetSpot Supernova Host Galaxies*”, American Astronomical Society Meeting Abstracts 228.

Codes and Data

- July 2019 **Malz, A. and 9 other authors including K. Ponder**, “*aimalz/proclam: Journal Submission*”, Zenodo, DOI: 10.5281/zenodo.3352639 .
Contribution: Data visualization.
- Jan 2019 **PLASTICC Team and PLASTICC Modelers**, “*Unblinded Data for PLAsTiCC Classification Challenge*”, Zenodo, DOI: 10.5281/zenodo.2539456.
Contribution: Data validation.

- Nov 2018 **Weyant, A., Wood-Vasey W. M. , Joyce, R., Allen, L. , Garnavich, P. , Jha S.W., Kroboth, J.R., Matheson, T., Ponder, K.A.**, *"VizieR Online Data Catalog: The First Data Release from SweetSpot: 74 Supernovae in 36 Nights on WIYN+WHIRC"*, VizieR Online Data Catalog, EID: J/AJ/155/201.
- July 2018 **Sloan Digital Sky Survey - Reverberation Mapping Project (39 authors including Kara A. Ponder)**, *"VizieR Online Data Catalog: SDSS RM project first year of observations (Grier+, 2017)"*, VizieR Online Data Catalog, EID: J/ApJ/851/21.
- Nov 2016 **Galbany, L., D'Andrea, C., Prajs, S., Smith, M., Sullivan, M., Ponder, K., and 46 other authors**, *"Classification of DES16C2nm as a SLSN at $z=1.998$ "*, The Astronomer's Telegram, Volume 9700. Contribution: Observing on the Magellan 6.5 m telescope.
- Feb 2015 **Sloan Digital Sky Survey III- Reverberation Mapping Project (39 authors including Kara Ponder)**, *"VizieR Online Data Catalog: SDSS-RM project: technical overview (Shen+, 2015)"*, VizieR Online Data Catalog, EID: J/ApJS/216/4.

Electronic Records

Click for
hyperlink: **Google Scholar, inSPIRE HEP, Research Gate, LinkedIn.**

REFERENCES

Michael Wood-Vasey, email: wmwv@pitt.edu.

Saurabh Jha, email: saurabh@physics.rutgers.edu.

Saul Perlmutter, email: saul@lbl.gov.

Renee Hložek, email: hlozek@dunlap.utoronto.ca.