Ondřej Pejcha

Primus group leader

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Research positions

since Sep 2017 : Primus group leader at Charles University (tenure-track)
Sep 2013 – Sep 2017 : Lyman Spitzer Jr. Fellow at Princeton University
Sep 2013 – Aug 2016 : NASA Hubble Fellow at Princeton University

Education

Aug 2013 : Ph.D., Astronomy, Ohio State University, thesis advisor: Todd A. Thompson
Aug 2010 : Master in Astronomy, Ohio State University
2006–2008 : Master in Theoretical Physics, Summa cum laude, Charles University, Prague, Czech Republic
2003–2006 : Bachelor in Physics, Summa cum laude, Charles University, Prague, Czech Republic

Research interests

Theory and observations of core-collapse supernovae, neutron star and black hole formation, stellar mergers, stellar and planetary dynamics (Kozai cycles), stellar variability (Cepheids, eclipsing binaries, transients), microlensing, fitting models to data

Honors and awards

2017 : Primus award from Charles University
2013 : Hubble Fellowship and Lyman Spitzer Jr. Fellowship, Princeton University
2012/2013 : Distinguished University Fellowship, Ohio State University
2011 : First place in Mathematical and physical sciences at the 25th Annual Hayes Graduate Research Forum, Ohio State University
2008/2009 : Distinguished University Fellowship, Ohio State University
2002 : Grammar School Student Award, The Learned Society of the Czech Republic
2001 : Jindřich Šilhán price "Observer of the year" (Czech Astronomical Society)

Refereed publications

summary: 27 papers total, 15 first-author papers, 4 with significant contribution and 8 with contribution; 36 bulletins, telegrams and circulars not shown here

1. **Pejcha, O.**, Metzger, B. D., Tyles, J. G., Tomida, K., 2017, "Pre-explosion spiral mass loss of a binary star merger", accepted to *ApJ*
2. Metzger, B. D., **Pejcha, O.**, 2017, "Shock-Powered Light Curves of Luminous Red Novae as Signatures of Pre-Dynamical Mass Loss in Stellar Mergers", *MNRAS*, 471, 3200
3. Müller, T., Prieto, J. L., **Pejcha, O.**, Clocchiatti, A., 2017, "The Nickel Mass Distribution of Normal Type II Supernovae", *ApJ*, 841, 127
4. **Pejcha, O.**, Metzger, B. D., Tomida, K., 2016, "Binary Stellar Mergers with Marginally-Bound Ejecta: Excretion Disks, Inflated Envelopes, Outflows, and their Luminous Transients", *MNRAS*, 461, 2527
5. **Pejcha, O.**, Metzger, B. D., Tomida, K., 2016, "Cool and Luminous Transients from Mass-Losing Binary Stars", *MNRAS*, 455, 4351
6. Holoien, T. W.-S., Prieto, J. L., **Pejcha, O.**, et al., 2016, "Discovery and Observations of the Unusually Bright Type-Defying II-P/II-L Supernova ASASSN-13co", *Acta Astronomica*, 66, 219
7. **Pejcha, O.**, Prieto, J. L., 2015, "On The Intrinsic Diversity of Type II-Plateau Supernovae", *ApJ*, 806, 225

8. **Pejcha, O.**, Thompson, T. A., 2015, "The Landscape of the Neutrino Mechanism of Core-Collapse Supernovae: Neutron Star and Black Hole Mass Functions, Explosion Energies and Nickel Yields", *ApJ*, 801, 90
9. **Pejcha, O.**, Prieto, J. L., 2015, "A Global Model of The Light Curves and Expansion Velocities of Type II-Plateau Supernovae", *ApJ*, 799, 215
10. Peterson, B. M., et al. (including **Pejcha, O.**), 2014, "Reverberation Mapping of the Seyfert 1 Galaxy NGC 7469", *ApJ*, 795, 145
11. **Pejcha, O.**, 2014, "Burying a Binary: Dynamical Mass Loss and an Optically-Thick Wind Explain the Candidate Stellar Merger V1309 Scorpii", *ApJ*, 788, 22
12. **Pejcha, O.**, Antognini, J. M., Shappee, B. J., Thompson, T. A., 2013, "Greatly enhanced eccentricity oscillations in quadruple systems composed of two binaries: implications for stars, planets and transients", *MNRAS*, 435, 943
13. Grier, C. J., et al. (including **Pejcha, O.**), 2013, "The Structure of the Broad Line Region in AGN: I. Reconstructed Velocity-Delay Maps", *ApJ*, 764, 47
14. **Pejcha, O.**, Dasgupta, B., Thompson, T. A., 2012, "Effect of Collective Neutrino Oscillations on the Neutrino Mechanism of Core-Collapse Supernovae", *MNRAS*, 425, 1083
15. **Pejcha, O.**, Thompson, T. A., Kochanek, C. S., 2012, "The observed neutron star mass distribution as a probe of the supernova explosion mechanism", *MNRAS*, 424, 1570
16. Grier, C. J., et al. (including **Pejcha, O.**), 2012, "Reverberation Mapping Results for Five Seyfert 1 Galaxies", *ApJ*, 755, 60
17. Cagaš, P., **Pejcha, O.**, 2012, "Discovery of a double eclipsing binary with periods near a 3:2 ratio", *A&A*, 744, L3
18. **Pejcha, O.**, Kochanek, C. S., 2012, "A Global Physical Model for Cepheids", *ApJ*, 748, 107
19. **Pejcha, O.**, Thompson, T. A., 2012, "The Physics of the Neutrino Mechanism of Core-collapse Supernovae", *ApJ*, 746, 106
20. Grier, C. J., et al. (including **Pejcha, O.**), 2012, "A Reverberation Lag for the High-ionization Component of the Broad-line Region in the Narrow-line Seyfert 1 Mrk 335", *ApJ*, 744, L4
21. Henderson, C. B., Stanek, K. Z., **Pejcha, O.**, Prieto, J. L., 2011, "An R- and I-band Photometric Variability Survey of the Cygnus OB2 Association", *ApJS*, 194, 27
22. Poddaný, S., Brát, L., **Pejcha, O.**, 2010, "Exoplanet Transit Database. Reduction and processing of the photometric data of exoplanet transits", *New Astronomy*, 15, 297
23. Sumi, T., et al. (including **Pejcha, O.**), 2010, "A Cold Neptune-Mass Planet OGLE-2007-BLG-368Lb: Cold Neptunes Are Common", *ApJ*, 710, 1641
24. **Pejcha, O.**, Stanek, K. Z., 2009, "The Structure of the Large Magellanic Cloud Stellar Halo Derived using OGLE-III RR Lyr Stars", *ApJ*, 704, 1730
25. **Pejcha, O.**, 2009, "Time-Dependent Rebrightenings in Classical Nova Outbursts: A Late-Time Episodic Fuel Burning?", *ApJ*, 701, L119
26. **Pejcha, O.**, Heyrovský, D., 2009, "Extended-Source Effect and Chromaticity in Two-Point-Mass Microlensing", *ApJ*, 690, 1772
27. Uemura, M., et al. (including **Pejcha, O.**), "Deep Fading of the New Herbig Be Star MisV1147", *PASP*, 56, 183

Students Supervised in Research

since 2017 : Dominika Hubová, Charles University undergraduate student, "Mass loss from binary stars"

2016–2017 : Jacob Tyles, Princeton undergraduate student, "Dynamical response of stars to mass loss: applications to transients", co-author on paper

2015–2017 : Tomás Müller, Master student at Catolica, Chile, "Nickel mass distribution of normal Type II supernovae", main advisors Jose Luis Prieto and Alejandro Clocchiatti, paper published

2015–2017 : Semyeong Oh, Princeton graduate student, "Mergers and transients from hypervelocity binaries ejected by binary supermassive black holes"

summer 2015 : Arjun Raghavan, North Carolina, "Characterizing uncertainties and covariances in modeling Type II-Plateau Supernova Light Curves"

Invited Conference Talks

September 2017 : The Dynamic Infrared Sky, Caltech, Pasadena, USA
March 2017 : Phenomena, Physics, and Puzzles Of Massive Stars and their Explosive Outcomes, KITP, Santa Barbara, CA
September 2016 : Fellows at the Frontiers 2016, Northwestern University, Evanston, IL
June 2016 : Shocks and Particle Acceleration in Novae and Supernovae, New York, NY
April 2015 : American Physical Society April Meeting, Baltimore, MD

Invited Talks at Research Institutions

(at least part of the travel costs covered by the receiving institution)

February 2017 : Colloquium, Department of Astronomy, University of Maryland, College Park, MD
February 2017 : Colloquium, Department of Astronomy, University of Arizona, Tucson, AZ
January 2017 : Colloquium and Seminar, Institute of Astronomy, University of Hawaii, Honolulu, HI
November 2016 : CIERA Special Seminar, Northwestern University, IL
November 2016 : Colloquium, Department of Astronomy, Caltech, Pasadena, CA
October 2016 : Seminar, Astronomical Observatory, University of Warsaw, Poland
September 2016 : Seminar, Astrophysics Research Centre, Queen's University, Belfast, UK
March 2016 : Seminars, Astronomical Institute of the Czech Academy of Sciences, Czech Republic
December 2015 : Colloquium, Kavli Institute for Astronomy and Astrophysics, Beijing, China
October 2015 : Lars Bildsten's group meeting, Kavli Institute for Theoretical Physics, Santa Barbara, CA
October 2015 : Supernova light curves group meeting, California Institute of Technology, Pasadena, CA
October 2015 : Adam Riess's group meeting, John Hopkins University, Baltimore, MD
March 2015 : Astronomy Seminar, Dartmouth University, Hanover, NH
March 2015 : ITC Seminar, Center for Astrophysics, Harvard University, Cambridge, MA
January 2015 : Astrophysics Seminar, Rutgers University, NJ
November 2014 : CIERA Special Seminar, Northwestern University, IL
November 2012 : Informal Seminar, Institute for Advanced Study, Princeton, USA
October 2012 : Seminar, Theoretical Astrophysics Center, University of California, Berkeley, CA

Other Talks

June 2017 : contributed talk at FOE2017, Corvallis, OR
March 2017 : Thursday lunch talk, Princeton University, NJ
November 2016 : contributed talk at Preparing for SN science in the LSST era: A kickoff workshop, Pittsburgh, PA
October 2016 : contributed talk at 8th Huntsville GRB Symposium, Huntsville, AL
September 2016 : Seminar, Department of Theoretical Physics and Astrophysics, Masaryk University, Czech Republic
August 2016 : contributed talk at The Supernovae Through the Ages Conference, Easter Island, Chile
May 2016 : Eliot Quataert's group meeting, University of California, Berkeley, CA
May 2016 : "Bigboom" group meeting, University of Arizona, Tucson, AZ
March 2016 : Seminar, Department of Theoretical Physics and Astrophysics, Masaryk University, Czech Republic
March 2016 : Hubble Fellows Symposium, Space Telescope Science Institute, MD
January 2016 : contributed talk at 227th meeting of the American Astronomical Society, Kissimmee, FL
October 2015 : Theory Thursday seminar, Carnegie Observatories, Pasadena, CA
October 2015 : Friday Lunch Time Astrophysics Seminar, University of California, Santa Cruz, CA
March 2015 : Hubble Fellows Symposium, Space Telescope Science Institute, MD
December 2014 : Seminar, Department of Astronomy, Columbia University, NY
October 2014 : Thursday lunch talk, Princeton University, NJ
March 2014 : Hubble Fellows Symposium, Space Telescope Science Institute, MD
November 2013 : contributed talk at Conference on Supernovae, Kyoto, Japan
January 2013 : Seminar, Group of Relativistic Astrophysics, Astronomical Institute of the Academy of Sciences, Prague, Czech Republic
January 2013 : dissertation talk at 221th meeting of the American Astronomical Society, Long Beach, CA

October 2012 : contributed talk at Workshop on Outstanding Problems in Massive Star Research, Minneapolis, MN
May 2011 : Seminar, Institute of Theoretical Physics, Charles University, Prague, Czech Republic
May 2009 : contributed talk at MDM Science Meeting, Columbia University, New York, USA
May 2008 : Seminar, Astronomical Institute, Academy of Sciences, Czech Republic
January 2008 : contributed talk at Manchester Microlensing Conference, Manchester, UK
December 2007 : Seminar, General relativity group, Institute of Theoretical Physics, Charles University, Prague, Czech Republic
June 2007 : contributed talk at Stellar astrophysics conference, Bezovec, Slovakia
March 2006 : Seminar, Astrophysics Division, Department of Theoretical Physics and Astrophysics, Masaryk University, Brno, Czech Republic
August 2002 : contributed talk at A.F.O.E.V. international conference on Variable Stars, Bourbon-Lancy, France
since 1999 : contributed talks at annual conferences on variable star research, Czech Republic

Outreach Talks

January 2017 : Lecture, Amateur Astronomers Association of Princeton
August 2015 : Undergraduate Summer Research Program, Princeton, NJ
May 2012 : Astronomical Society Pardubice, Czech Republic
August 2011 : Summer meeting of the Variable star and exoplanet section, Czech Astronomical Society
May 2011 : Astronomical Society Pardubice, Czech Republic
June 2009 : Astronomical Society Pardubice, Czech Republic
March 2008 : Astronomical Society Pardubice, Czech Republic

Observing Experience

1. Large Binocular Telescope, 5 nights in March 2009, optical photometry
2. MDM 2.4m, 7 nights in November 2009, optical long-slit spectroscopy and photometry
3. MDM 1.3m, three weeks total in 2009 and 2010, optical long-slit spectroscopy and photometry
4. SAAO 1.0m, two weeks in 2007, optical photometry of microlensing events
5. Brno Observatory and Planetarium 0.4m, Czech Republic, 120 nights in 2002−2005, optical photometry
6. Visual estimates, 6500 magnitude estimates and 120 eclipsing binaries minima timings between 1998 and 2002

Professional Activities

1. established “science coffee” discussion for Institute of Theoretical Physics and Astronomical Institute at Charles University to discuss new preprints and to foster interactions.
2. member of SOC for Common Envelope Evolution Worskhop at Center for Computational Astrophysics, NY (May 2017)
3. panelist for National Science Foundation Stellar Astronomy panel
4. panelist for the NASA Astrophysics Theory Program
5. reviewer for the NASA Earth and Space Science Fellowship Program
6. referee for The Astrophysical Journal, The Astrophysical Journal Letters, The Astronomical Journal, Monthly Notices of the Royal Astronomical Society, Astrophysics & Space Science
7. member of the Executive committee of the Variable Star and Exoplanet Section of the Czech Astronomical Society (since 2008)