

# Petr Kurfürst - Curriculum Vitae

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## Education

- November 2015 : Ph.D., Astrophysics, Masaryk University, thesis advisor: Jiří Krtička  
2008 - 2010 : Mgr. (equivalent to M.S.), Theoretical Physics, Summa cum laude, Masaryk University, Brno, Czech Republic  
2005 - 2008 : Bc. (equivalent to B.Sc.), Physics, Summa cum laude, Masaryk University, Brno, Czech Republic

## Positions

- 2016 - 2020 : Postdoctoral researcher, Masaryk University, group leader: Jiří Krtička  
2019 - 2020 : Postdoctoral researcher, Charles University, Praha, Czech Republic, group leader: Ondřej Pejcha

## Research interests

Computational methods in astrophysics, physics and evolution of massive stars, theory of thermonuclear and core-collapse supernovae, physics of circumstellar environment (stellar winds, circumstellar disks), interactions of supernovae with circumstellar matter

## Refereed publications

summary: 12 publications total, 5 first-author, 3 with significant contribution, and 4 with contribution

1. Shafter, A. W., Hornoch, K., et al. (incl. **Kurfürst, P.**), 2021, “A Survey of Novae in M83”, arXiv:2110.00676
2. **Kurfürst, P.**, Pejcha, O., Krtička, J., 2020, “Supernova explosions interacting with aspherical circumstellar material: Implications for light curves, spectral line profiles, and polarization”, *Astronomy and Astrophysics*, 642, A214, arXiv:2008.13169, **5 citations** in ADS
3. Zasche, P., et al. (including **Kurfürst, P.**), 2020, “First apsidal motion and light curve analysis of 162 eccentric eclipsing binaries from LMC”, *Astronomy and Astrophysics*, 640, A33, **3 citations** in ADS
4. **Kurfürst, P.**, Krtička, J., 2019, “Modeling of interactions between supernovae ejecta and aspherical circumstellar environments”, *Astronomy and Astrophysics*, 625, A24, **6 citations** in ADS
5. **Kurfürst, P.**, Feldmeier, A., Krtička, J., 2018, “Two-dimensional modeling of density and thermal structure of dense circumstellar outflowing disks”, *Astronomy and Astrophysics*, 613, A75, **7 citations** in ADS
6. Cariddi, S., Azatyan, N. M., **Kurfürst, P.**, et al., 2018, “A search for peculiar stars in the open cluster Hogg 16,” *New Astronomy*, 58, 1C, **3 citations** in ADS
7. Jurýšek, J., et al. (including **Kurfürst, P.**), 2018, “New inclination changing eclipsing binaries in the Magellanic Clouds”, *Astronomy and Astrophysics*, 609, A46, **12 citations** in ADS
8. Zasche, P., et al. (including **Kurfürst, P.**), 2017, “The Strange Case of OGLE-SMC-ECL-0277”, *Acta Astronomica* 67, 243
9. **Kurfürst, P.**, Krtička, J., 2017, “Time-dependent numerical modeling of large-scale astrophysical processes: from relatively smooth flows to explosive events with extremely sharp discontinuities and high Mach numbers”, *Applications of Mathematics*, 62, 6, **2 citations** (in WOS, not in ADS)
10. Krtička, J., Mikulášek, Z., Henry, G. W., **Kurfürst, P.**, et al., 2016, “Torsional oscillations and observed rotational period variations in early-type stars”, *Monthly Notices of the Royal Astronomical*

*Society*, 464, 933, **12 citations** in ADS

11. Krtička, J., **Kurfürst, P.**, Krtičková, I., 2015, “Magnetorotational instability in the decretion disks of critically rotating stars and the outer structure of Be and Be/X-ray disks”, *Astronomy and Astrophysics*, 573, A20, **9 citations** in ADS
12. **Kurfürst, P.**, Feldmeier, A., Krtička, J., 2014, “Modeling of extended decretion disks of critically rotating stars”, 2014, *Astronomy and Astrophysics*, 569, A23, **21 citations** in ADS

## Conference Proceedings

1. Paunzen, E., Janík, J., **Kurfürst, P.**, Liška, J., Netopil, M., Skarka, M., Zejda, M., “AGB stars of the Magellanic Clouds as seen within the  $\Delta$ a photometric system”, proceedings of *Why Galaxies Care About AGB Stars: A Continuing Challenge through Cosmic Time*, Vienna, Austria, August, 2018. Cambridge University Press, 2020, Volume 14, p. 487
2. **Kurfürst, P.**, Krtička, J., “Modeling of hydrodynamic processes within high-mass X-ray binaries”, proceedings of *High-mass X-ray Binaries: Illuminating the Passage from Massive Binaries to Merging Compact Objects*, Vienna, Austria, August, 2018. Cambridge University Press, 2019, Volume 14, p. 197
3. **Kurfürst, P.**, Krtička, J., Zejda, M., “Modeling the effects of interaction between supernova ejecta and dense circumstellar material”, proceedings of the *50th Conference on Variable Stars Research*, Brno, Czech Republic, November, 2018. Open European Journal on Variable Stars, March 2019, p. 57
4. **Kurfürst, P.**, Krtička, J., “Modeling variability of Be stars”, proceedings of the *50th Conference on Variable Stars Research*, Brno, Czech Republic, November, 2018. Open European Journal on Variable Stars, March 2019, p. 43
5. **Kurfürst, P.**, Prvák, M., Krtička, J., Zejda, M., 2017, “Research of Hot Stars at Masaryk University”, proceedings of *XVth Hvar Astrophysical Colloquium - 45 years of Hvar Observatory and 20 years of ACT: The role of 1-m class telescopes now and in the future*, Hvar, Croatia, October, 2017. Central European Astrophysical Bulletin, 2017, p. 39
6. Krtička, J., Owocki, S. P., **Kurfürst, P.**, “Mass and Angular Momentum Loss of B[e] Stars via Decretion Disks”, proceedings of *B[e] Phenomenom: Forty Years of Studies*, Praha, Czech Republic, June, 2016. San Francisco: Astronomical Society of the Pacific, 2017, Volume 508, p. 73
7. **Kurfürst, P.**, Feldmeier, A., Krtička, J., “Modeling sgB[e] Circumstellar Disks”, proceedings of *B[e] Phenomenom: Forty Years of Studies*, Praha, Czech Republic, June, 2016. San Francisco: Astronomical Society of the Pacific, 2017, Volume 508, p. 17, **3 citations** in ADS
8. Paunzen, E., Janík, J., **Kurfürst, P.**, Liška, J., Netopil, M., Skarka, M., Zejda, M., “Tracing the B[e] Phenomenon with the Narrow-Band delta a Photometric System”, , proceedings of *B[e] Phenomenom: Forty Years of Studies*, Praha, Czech Republic, June, 2016. San Francisco: Astronomical Society of the Pacific, 2017, Volume 508, p. 143
9. **Kurfürst, P.**, Feldmeier, A., Krtička, J., “Hydrodynamical Modeling of Large Circumstellar Disks”, proceedings of *Bright Emissaries: Be Stars as Messengers of Star-Disk Physics*, London, Canada, July, 2014. San Francisco: Astronomical Society of the Pacific, 2016, Volume 506, p. 149
10. **Kurfürst, P.**, Krtička, J., “Hydrodynamics of Outer Parts of Viscous Decretion Disks of Critically Rotating Stars”, proceedings of *Circumstellar Dynamics at High Resolution*, Foz do Iguaçu, Brasil, February, 2012. San Francisco: Astronomical Society of the Pacific, 2012, Volume 464, p. 223, **3 citations** in ADS
11. **Kurfürst, P.**, “Hydrodynamics of Decretion Disks of Rapidly Rotating Stars”, proceedings of *From Interacting Binaries to Exoplanets: Essential Modeling Tools*, Tatranská Lomnica, Slovakia, July, 2011. Cambridge University Press, 2012, Volume 7, p. 257, **2 citations** in ADS

## Textbooks

1. **Kurfürst, P.**, “Početní praktikum (Computing practice)”, 2017, *e-Portal of Masaryk University*, ISBN: 978-80-210-8686-9

## Catalogs, Telegrams

1. Zasche, P., Wolf, M., Kučáková, H., Kára, J., Merc, J., Zejda, M., Skarka, M., Janík, J., **Kurfürst, P.**, “LMC 162 eccentric eclipsing binaries light curve”, *VizieR Online Data Catalog*, 2020
2. Hornoch, K., Kučáková, H., **Kurfürst, P.**, “Discovery of a Probable Nova in M83” The Astronomer’s Telegram, 2019, 12564, **1 citation** in ADS
3. Cariddi, S., Azatyan, N. M., **Kurfürst, P.**, Štofánová, L., Netopil, M., Paunzen, E., Pintado, O. I., and Aidelman, Y. J., “Hogg 16 peculiar stars”, *VizieR Online Data Catalog*, 2017

## Invited Talks

- September 2020 : Seminar of astronomical department, Charles University, Praha  
January 2018 : Seminar of Astronomical institute, Czech Academy of Science, Ondřejov, Czech Republic  
October 2017 : XV Hvar Astrophysical Colloquium, Hvar, Croatia  
September 2017 : Seminar of Astronomical institute, Czech Academy of Science, Ondřejov, Czech Republic  
May 2014 : Seminar of astronomical department, Charles University, Praha

## Conferences and Summer Schools

- April 2019 : poster at The Deaths and Afterlives of Stars, Baltimore, MD  
November 2018 : oral talk and poster at 50th Conference on Variable Stars Research, Brno, Czech Republic  
October 2018 : poster at Massive Stars and Supernovae, San Carlos de Bariloche, Argentina  
August 2018 : poster at IAU Symposium - High-mass X-ray Binaries: Illuminating the Passage from Massive Binaries to Merging Compact Objects, Vienna, Austria  
June 2018 : poster at Shocking Supernovae, Stockholm, Sweden  
December 2017 : The 35th Jerusalem Winter School in Theoretical Physics: The Physics of Astronomical Transients, Jerusalem, Israel  
September 2017 : oral talk at Be/X-ray Binaries conference, Herakleion, Greece  
March 2017 : Supernovae: Cosmic Explosions, 47th Saas-Fee Advanced Course for Astrophysics and Astronomy, Villars-sur-Ollon, Switzerland,  
January 2017 : oral talk at Conference on Numerical Analysis, Ostrava, Czech Republic  
June 2016 : oral talk at The B[e] Phenomenon: Forty Years of Studies, Praha, Czech Republic  
May 2016 : poster at Bridging the gap: from Massive Stars to Supernovae, Chicheley Hall, UK  
September 2015 : ESO/OPTICON/IAU summer school on modern instruments, Brno, Czech Republic  
July 2014 : oral talk at Bright Emisseries: Be Stars as Messengers of Star-Disk Physics, London, ON, Canada  
May 2013 : poster at Massive Stars: From Alpha to Omega, Rhodes, Greece  
March 2013 : Star formation in galaxy evolution: connecting numerical models to reality, 43rd Saas-Fee Advanced Course for Astrophysics and Astronomy, Villars-sur-Ollon, Switzerland, poster at Circumstellar Dynamics at High Resolution, Foz do Iguaçu, Brasil  
February 2012 : poster at IAU Symposium - From Interacting Binaries to Exoplanets, Tatranská  
July 2011 : Lomnica, Slovakia

## **Observing experience**

1. Masaryk University Observatory 0.6m telescope, Czech Republic, 48 nights in 2008 - 2020, optical photometry
2. SAAO 1.0m Telescope, 12 nights in 2014, optical photometry
3. DK154 telescope (La Silla, remotely), 28 nights in 2014 - 2020, optical photometry
4. Ondrejov 2.0m, Czech Republic, 8 nights in 2015 - 2016, echelle spectroscopy

## **Teaching experience**

1. Lecturer of Mathematical and Computing practice course for undergraduate students at Masaryk University, Brno, 2014 - 2020
2. Supervisor of master thesis: Modeling of expanding envelopes of supernovae, 2018 - 2019, Masaryk University, Brno
3. Consultant of dissertation: Hydrodynamics of stellar winds of hot stars, 2018 - 2020, Masaryk University, Brno

## **Outreach activity**

1. 8 talks for the University of the Third Age (for seniors attending the lifelong learning), 2014 - 2020, Masaryk University, Brno
2. 3 talks at the Researchers' Night event (for children and adults who interest in science), 2016 - 2020, Masaryk University, Brno