

# Maciek Wielgus

Max Planck Institute for Radio Astronomy  
Auf dem Hugel 69, 53121 Bonn, Germany

✉ maciek.wielgus@gmail.com

☎ +48 602417268

🌐 wielgus.info

## EDUCATION

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<b>Warsaw University of Technology</b> <i>Ph.D. in Machine Design and Maintenance: Photonic Engineering</i> Dissertation: Adaptive decomposition and analytic signal concept in the interferometric fringe pattern analysis	Sep 2016
<b>Warsaw University of Technology</b> <i>M.S. in Robotics and Automatic Control: Photonic Engineering (interferometric pattern analysis)</i>	Dec 2010
<b>Warsaw University</b> <i>B.S. in Mathematics: Numerical Analysis (partial differential equations)</i>	Sep 2010

## PROFESSIONAL EXPERIENCE

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<b>Postdoctoral Researcher</b> <i>Max Planck Institute for Radio Astronomy, Bonn, Germany</i>	Oct 2021 – present
<b>Visiting Researcher</b> <i>Paris Observatory Scientific Council grant, Meudon, France (reference: Frederic Vincent)</i>	Jul 2022
<b>Black Hole Initiative Postdoctoral Fellow</b> <i>Harvard University, Cambridge, USA (mentor: Shep Doeleman)</i>	May 2017 – Aug 2021
<b>Confronting Theories of Accretion with Observations, KITP Program</b> <i>Visiting Scholar, UCSB, Santa Barbara, USA</i>	Jan 2017 – Mar 2017
<b>Postdoctoral researcher at Nicolaus Copernicus Astronomical Center</b> <i>Polish Academy of Sciences, Warsaw, Poland (mentors: Wlodek Kluźniak, Marek Abramowicz)</i>	Jan 2017 – May 2017
<b>Internship at Center for Astrophysics   Harvard &amp; Smithsonian</b> <i>Cambridge, USA (mentors: Ramesh Narayan, Olek Sądowski)</i>	Oct 2015 – Dec 2015
<b>Visiting Scholar at Kavli Institute for Theoretical Physics, UCSB</b> <i>Santa Barbara, USA (mentors: Omer Blaes, Wlodek Kluźniak)</i>	Jun 2015
<b>Visiting Scholar at Peking University Kavli Institute for Astronomy and Astrophysics</b> <i>Beijing, China (mentors: Marek Abramowicz, Fukun Liu)</i>	Aug 2014
<b>Visiting Scholar at University of Capetown</b> <i>Capetown, South Africa (mentor: George F. R. Ellis)</i>	May 2014
<b>Internship at National Center of the Industrial Technology</b> <i>Buenos Aires, Argentina (mentors: Guillermo Kaufmann, Alejandro Frederico)</i>	Oct 2013 – Nov 2013
<b>Internship at Center for Astrophysics   Harvard &amp; Smithsonian</b> <i>Cambridge, USA (mentors: Ramesh Narayan, Olek Sądowski)</i>	Jun 2013 – Aug 2013
<b>Internship at the College of Charleston</b> <i>Charleston, USA (mentor: Chris Fragile)</i>	May 2013 – Jun 2013
<b>Engineer at the Institute of Electron Technology</b> <i>Warsaw, Poland</i>	2011 – 2013

## RESEARCH INTERESTS

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- astrophysics of compact objects
- general relativity
- very long baseline radio interferometry
- applied signal and image processing
- physics of accretion
- magnetohydrodynamics
- developing EHT data reduction and inspection pipeline

## AWARDS

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EHT Early Career Award (individual)	2021 and 2020
Group Award (A) from the Royal Astronomical Society (EHT collaboration)	2021
Albert Einstein medal (EHT collaboration)	2020
Bruno Rossi Prize for a contribution to High Energy Astrophysics (EHT collaboration)	2020
Breakthrough Prize in Fundamental Physics (EHT collaboration)	2020
Smithsonian Institute American Ingenuity Award (EHT collaboration)	2019
Black Hole Initiative Prize for scientific contributions to the EHT project (individual)	2019
National Science Foundation Diamond Achievement Award (EHT collaboration)	2019
First prize in IXth Nationwide Competition for a Best PhD Thesis "Young Innovators"	2017
Polish Prime Minister Award for the best PhD thesis in engineering	2017
Foundation for Polish Science START award (in 2015 with distinction as 1 of 5 young scientists nationwide)	2015 – 2016
Academic performance award from Polish Ministry of Science and Higher Education	2013
Scientific scholarship and travel award from the Center for Advanced Studies Warsaw University of Technology	2012 – 2013
SPIE best student presentation award, International Conference on Advanced Topics in Optoelectronics, Microelectronics and Nanotechnology, Constanza, Romania	2012
Laureate (6th place nationwide) of the National Mathematics Competition for high school students	2005

## Publications

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82 reviewed scientific journal papers (17 as a first author). 106 items **listed on ADS** (24 as a first author). 7261 citations, h-index=33, 62 papers cited at least 10 times (ADS, October 2022). Complete list of papers appended.

## TALKS

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I have given well over 100 professional talks and many outreach talks. A separate incomplete list can be found **on my website**. Below 10 recent talks that I am particularly happy with.

<i>First image of the black hole shadow in Sagittarius A*</i> , KIPAC seminar, Stanford (invited)	Jun 2022
<i>Variability of the Sagittarius A* millimeter light curves</i> , Black Hole Initiative Conference, Harvard (invited)	May 2022
<i>Would we know a wormhole if we saw one?</i> 16th Marcel Grossmann Meeting (invited)	Jul 2021

<i>Polarized emission around the M87 supermassive black hole,</i> SLAC seminar, Stanford (invited)	Mar 2021
<i>Monitoring M87* in 2009–2017 with the EHT,</i> Seminar at Radboud University, Nijmegen (invited)	Feb 2020
<i>Analyzing time variability of Sgr A* in the EHT data,</i> New Horizons in Galactic Center Astronomy and Beyond, Yokohama	Oct 2019
<i>Observing AGN sources with the Event Horizon Telescope,</i> IAU 356, Addis Ababa	Oct 2019
<i>Optically thick accretion: from theory to the most recent results,</i> University of Waterloo, astronomy seminar (invited)	Sep 2019
<i>Event Horizon Telescope,</i> CTA 1st Science Symposium, Bologna (invited)	May 2019
<i>First EHT results,</i> Astronomy Department, Yale University (invited)	Apr 2019

## GRANTS AND FORMAL PROJECTS

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<b>PI: Dynamics of the Centaurus A jet base on a light-day scale</b> <i>ALMA cycle 8 VLBI observations</i>	2022
<b>Co-PI: Probing relativistic jets through mm-VLBI of X-ray binaries</b> <i>GMVA VLBI observations, PI: Alex Tetarenko</i>	2022
<b>Co-PI: Ultra-high resolution imaging of 3C84</b> <i>ALMA cycle 8 VLBI observations</i>	2022
<b>PI: Thin disks GRRMHD simulations</b> <i><math>3 \times 10^7</math> CPU hours on PROMETHEUS supercomputer from PLGRID</i>	2018 – 2022
<b>Named participant: Variable accretion flows</b> <i>Polish National Science Center Maestro grant, PI: Wlodek Kluźniak</i>	2013 – 2018
<b>CO-PI: Adaptive processing of fringe patterns in optical whole-field measurements</b> <i>Polish National Science Center Opus grant, PI: Krzysztof Patorski</i>	2013 – 2015
<b>PI: Automatic image analysis for nanomaterials research</b> <i>Foundation for Polish Science VENTURES grant</i>	2012 – 2014
<b>Named participant: Turbulent viscosity in non-stationary black hole accretion disks</b> <i>Polish National Science Center Opus grant, PI: Marek Abramowicz</i>	2012 – 2014

## TEACHING EXPERIENCE

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<b>Lecturer of astrophysics at the relativistic accretion workshop, University of Bremen</b> <i>Transonic flows, ideal MHD, MRI</i>	Sep 2016
<b>Teaching at Warsaw University of Technology</b> <i>Optomechatronics lab, Mechatronic systems lab, and Instrumental optics lab</i>	2011 – 2015
<b>Teaching assistant and tutor at Warsaw University</b> <i>Calculus I &amp; II, linear algebra for math students</i>	2010 – 2011

## OTHER ACTIVITIES

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- o leading the EHT Time Domain Working Group 2018-2022
- o one of the key contributors to the EHT data set reduction and inspection pipeline development
- o paper coordinator for the collaboration paper EHTC, ApJL 875 L3 (2019)
- o reviewer for MNRAS, A&A, ApJ, PRL, New Astronomy, Applied Optics, Optics Express, Optics Letters
- o SOC member for EHT polarization workshop, Max-Planck Institute for Radio Astronomy, July 2019 and EHT Collaboration Meeting, Granada, June 2022,

- advised multiple students with scientific projects (W. Yan, D. Bollimpalli, S. Steel, D. Lancova)
- named participant on multiple VLBI observational proposals
- reviewer of grant proposals at the Czech Science Foundation in the Astronomy panel
- member of the Polish Astronomical Society

## LANGUAGES

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- **Polish** [fluent]
- **English** [fluent]

## Journal papers

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86. *Tracing hot spot motion using the next generation Event Horizon Telescope*, Emami, R., Tiede, P., Doeleman, S. S., Roelofs, F., **Wielgus, M.**, et al., submitted to *Galaxies*,
85. *Event Horizon Telescope Image of the Quasar NRAO 530*, Jorstad, S., **Wielgus, M.**, Lico, R., Issaoun, S. + EHTC, submitted to *ApJ*,
84. *Unraveling Twisty Linear Polarization Morphologies in Black Hole Images*, Emami, R., Ricarte, A., Wong, G., + 26 authors, submitted to *ApJ*, arXiv:2210.01218,
83. *Spectra of Puffy Accretion Discs: the kynbb Fit*, Lancova, D., Yilmaz, A., **Wielgus, M.**, + 3 authors, submitted to *Astronomische Nachrichten*, arXiv:2209.03713,
82. *Collimation of the relativistic jet in the quasar 3C 273*, Okino, H., Akiyama, K., Asada, K., +32 authors, accepted in *ApJ*, arXiv:2112.12233,
81. *Polarimetric signatures of hot spots in black hole accretion flows*, Vos, J., Moscibrodzka, M., and **Wielgus, M.**, accepted in *A&A*, arXiv:2209.09931,
80. *Photon ring test of the Kerr hypothesis: variation in the ring shape*, Pagnat, H., Lupsasca, A., Vincent, F., and **Wielgus, M.**, accepted in *A&A*, arXiv:2206.02781,
79. *Images and photon ring signatures of thick disks around black holes*, Vincent, F., Gralla, S., Lupsasca, A., and **Wielgus, M.**, accepted in *A&A*, arXiv:2206.12066,
78. *A first search of transients in the galactic center from 230 GHz ALMA observations*, Mus, A., Marti-Vidal, I., **Wielgus, M.**, and Stroud, G., *A&A* 666, A39 (2022), arXiv:2208.08248,
77. *Orbital motion near Sagittarius A\*. Constraints from polarimetric ALMA observations*, **Wielgus, M.**, Moscibrodzka, M., Vos, J., Gelles, Z., + 5 authors, *A&A* 665, L6 (2022), arXiv:2209.09926,
76. *A robust test on the existence of primordial black holes in galactic dark matter halos*, Abramowicz, M., Bejger, M., Udalski, A., and **Wielgus, M.**, *ApJL* 935, L28 (2022), arXiv:2206.13335,
75. *Photon ring in M87\**, Broderick, A., Pesce, D., Gold, R. + 48 authors, *ApJ* 935, 61 (2022), arXiv: 2208.09004,
74. *Resolving the inner parsec of the blazar J1924–2914 with the Event Horizon Telescope*, Issaoun, S., **Wielgus, M.**, Jorstad, S., Krichbaum, T. + 264 authors, *ApJ* 934, 145 (2022), arXiv:2208.01662,
73. *Observational properties of puffy disks: radiative GRMHD spectra of mildly sub-Eddington accretion*, **Wielgus, M.**, Lancova, D., Straub, O., Kluzniak, W. + 6 authors, *MNRAS* 514, 780 (2022), arXiv:2202.08831,
72. *Characterizing and Mitigating Intraday Variability: Reconstructing Source Structure in Accreting Black Holes with mm-VLBI*, Broderick, A., Gold, R., Georgiev, B., + 264 authors, *ApJL* 930, L21 (2022),
71. *A Universal Power-law Prescription for Variability from Synthetic Images of Black Hole Accretion Flows*, Georgiev, B., Pesce, D., Broderick, A., Wong, G., Dhruv, V., **Wielgus, M.** + 263 authors, *ApJL* 930, L20 (2022),
70. *Millimeter Light Curves of Sagittarius A\* Observed during the 2017 Event Horizon Telescope Campaign*, **Wielgus, M.**, Marchili, N., Marti-Vidal, I., Keating, G. K. + 263 authors, *ApJL* 930, L19 (2022), arXiv:2207.06829,
69. *Selective Dynamical Imaging of Interferometric Data*, Farah, J., Galison, P., Akiyama, K., Bouman, K., Bower, G., Chael, A., Fuentes, A., Gomez, J. L., Narayan, R., Honma, M., Johnson, M. D., Moriyama, K., Kofuji, Y., **Wielgus, M.** + 221 authors, *ApJL* 930, L18 (2022),
68. *First Sagittarius A\* Event Horizon Telescope Results. VI. Testing the Black Hole Metric*, EHT Collaboration (270 authors), *ApJL* 930, L17 (2022),
67. *First Sagittarius A\* Event Horizon Telescope Results. V. Testing Astrophysical Models of the Galactic Center Black Hole*, EHT Collaboration (274 authors), *ApJL* 930, L16 (2022),
66. *First Sagittarius A\* Event Horizon Telescope Results. IV. Variability, Morphology, and Black Hole Mass*, EHT Collaboration (269 authors), *ApJL* 930, L15 (2022),
65. *First Sagittarius A\* Event Horizon Telescope Results. III. Imaging of the Galactic Center Supermassive Black Hole*, EHT Collaboration (270 authors), *ApJL* 930, L14 (2022),
64. *First Sagittarius A\* Event Horizon Telescope Results. II. EHT and Multiwavelength Observations, Data Processing, and Calibration*, EHT Collaboration (337 authors), *ApJL* 930, L13 (2022),



63. *First Sagittarius A\* Event Horizon Telescope Results. I. The Shadow of the Supermassive Black Hole in the Center of the Milky Way*, EHT Collaboration (388 authors), *ApJL* 930, L12 (2022),
62. *The science case and challenges of space-borne sub-millimeter interferometry*, Gurvits, L., Paragi, Z. + 52 authors, *Acta Astronautica* 196, 314-333 (2022), [arXiv:2204.09144](#),
61. *MeqSilhouette v2: Spectrally-resolved polarimetric synthetic data generation for the Event Horizon Telescope*, Natarajan, I., Deane, R., Marti-Vidal, I., Roelofs, F., Janssen, M., **Wielgus, M.** +14 authors, *MNRAS* 512, 490 (2022), [arXiv:2202.11478](#),
60. *The intrinsic structure of Sagittarius A\* at 1.3 cm and 7 mm*, Cho, I., Zhao, G.-Y., Kawashima, T., +63 authors, *ApJ* 926, 108 (2022), [arXiv:2112.04929](#),
59. *The Variability of the Black-Hole Image in M87 at the Dynamical Time Scale*, Satapathy, K., Psaltis, D., Ozel, F., Medeiros, L., Dougall, S. T., Chan, C., **Wielgus, M.**, +231 authors, *ApJ* 925, 13 (2022), [arXiv:2111.01317](#),
58. *Photon rings of spherically symmetric black holes and robust tests of non-Kerr metrics*, **Wielgus, M.**, *PRD* 104, 124058 (2021), [arXiv:2109.10840](#),
57. *Event Horizon Telescope observations of the jet launching and collimation zone in Centaurus A*, Janssen, M., Falcke, H., Kadler, M., Ros, E., **Wielgus, M.**, +266 authors, *Nat Astron* 5 1017-1028 (2021), [arXiv:2111.03356](#),
56. *Persistent Non-Gaussian Structure in the Image of Sagittarius A\* at 86 GHz*, Issaoun, S., Johnson, M., Blackburn, L., Broderick, A., Tiede, P., **Wielgus, M.**, + 23 authors, *ApJ* 915, 99 (2021), [arXiv:2104.07610](#),
55. *Three-dimensional general relativistic Poynting-Robertson effect. IV. Slowly rotating and non-spherical quadrupolar massive source*, De Falco, V., **Wielgus, M.**, *PRD* 103, 084056 (2021), [arXiv:2103.17165](#),
54. *The Polarized Image of a Synchrotron Emitting Ring of Gas Orbiting a Black Hole*, Narayan, R., et al., *ApJ* 912, 35 (2021), [arXiv:2105.01804](#),
53. *Light echos and coherent autocorrelations in a black hole spacetime*, Chesler, P., Blackburn, L., Doeleman, S., Johnson, M., Moran, J., Narayan, R., **Wielgus, M.**, *Class. Quantum Grav.* 38, 13 (2021), [arXiv:2012.11778](#),
52. *Broadband Multi-wavelength Properties of M87 During the 2017 Event Horizon Telescope Campaign*, Algaba, J. C., + 744 authors, *ApJL* 911, L11 (2021), [arXiv:2104.06855](#),
51. *Polarimetric Properties of Event Horizon Telescope Targets from ALMA*, Goddi, C., + 249 authors, *ApJL* 910, L14 (2021),
50. *First M87 Event Horizon Telescope Results. VIII. Magnetic Field Structure near The Event Horizon*, EHT Collaboration (240 authors), *ApJL* 910, L13 (2021),
49. *First M87 Event Horizon Telescope Results. VII. Polarization of the Ring*, EHT Collaboration (239 authors), *ApJL* 910, L12 (2021),
48. *Elliptical accretion disk as a model for TDEs*, Liu, F., Cao, C., Abramowicz, M., **Wielgus, M.**, Cao, R., Zhou, Z., *ApJ* 908, 179 (2021), [arXiv:2012.05552](#),
47. *Geometric modeling of M87\* as a Kerr black hole or a non-Kerr compact object*, Vincent, F., **Wielgus, M.**, Abramowicz, M., Gourgoulhon, E., J. P. Lasota, + 2 authors, *A&A* 646, A37 (2021), [arXiv:2002.09226](#),
46. *Reflection-asymmetric wormholes and their double shadows*, **Wielgus, M.**, Horák, J., Vincent, F., Abramowicz, M., *PRD* 102, 084044 (2020), [arXiv:2008.10130](#),
45. *Gravitational Test Beyond the First Post-Newtonian Order with the Shadow of the M87 Black Hole*, Psaltis, D., + 187 authors, *PRL* 125, 141104 (2020), [arXiv:2010.01055](#),
44. *Monitoring the Morphology of M87\* in 2009-2017 with the Event Horizon Telescope*, **Wielgus, M.**, Akiyama, K., Blackburn, L., + 216 authors, *ApJ* 901, 67 (2020), [arXiv:2009.11842](#),
43. *Event Horizon Telescope imaging of the archetypal blazar 3C 279 at an extreme 20 microarcsecond resolution*, Kim, J.-Y., Krichbaum, T., Broderick, A., **Wielgus, M.**, + 349 authors, *A&A* 640, A69 (2020),
42. *Verification of Radiative Transfer Schemes for the EHT*, Gold, R., + 207 authors, *ApJ* 897, 148 (2020),
41. *THEMIS: A Parameter Estimation Framework for the Event Horizon Telescope*, Broderick, A., + 193 authors, *ApJ* 897, 139 (2020),
40. *Closure Statistics in Radio Interferometric Data*, Blackburn, L., Pesce, D., Johnson, M., **Wielgus, M.**, Chael, A., Christian, P., Doeleman, S., *ApJ* 894, 31 (2020), [arXiv:1910.02062](#),
39. *SYMBA: An end-to-end VLBI synthetic data generation pipeline. Simulating Event Horizon Telescope observations of M 87*, Roelofs, F., Janssen, M., + 207 authors, *A&A* 636, A5 (2020)

38. *Universal Interferometric Signatures of a Black Hole's Photon Ring*, Johnson, M., + 16 authors, *Science Advances* 6, eaaz1310 (2020), arXiv:1907.04329,
37. *Optically thin outbursts of rotating neutron stars can not be spherical*, **Wielgus, M.**, *MNRAS*, 488, 4937 (2019), arXiv:1907.11268,
36. *Puffy Accretion Disks: Sub-Eddington, Optically Thick, and Stable*, Lančová, D., Abarca, D., Kluźniak, W., **Wielgus, M.**, + 5 authors, *ApJL* 884, L37 (2019), arXiv:1908.08396,
35. *EHT-HOPS Pipeline for Millimeter VLBI Data Reduction*, Blackburn, L., Chan, C.-K., Crew, G., Fish, V., Issaoun, S., Johnson, M. D., **Wielgus, M.**, + 8 authors, *ApJ* 882, 23 (2019), arXiv:1903.08832,
34. *Atmospheric oscillations provide simultaneous measurement of neutron star mass and radius*, Bollimpalli, D., **Wielgus, M.**, Abarca, D., Kluźniak, W., *MNRAS* 487, 5129 (2019), arXiv:1812.01299,
33. *The Event Horizon General Relativistic Magnetohydrodynamic Code Comparison Project*, Porth, O., + 220 authors, *ApJSS* 243, 26 (2019), arXiv:1904.04923,
32. *Calibration of ALMA as a Phased Array. ALMA Observations During the 2017 VLBI Campaign* Goddi, C., Martí-Vidal, I., Messias, H., + 14 authors, *PASP* 131, 075003 (2019), arXiv:1901.09987,
31. *rPICARD: A CASA-based calibration pipeline for VLBI data. Calibration and imaging of 7 mm VLBA observations of the AGN jet in M 87* Janssen, M., + 9 authors, *A&A* 626, A75 (2019), arXiv:1902.01749,
30. *First M87 Event Horizon Telescope Results. VI. The Shadow and Mass of the Central Black Hole*, EHT Collaboration (214 authors), *ApJL* 875, L6 (2019), arXiv:1906.11243,
29. *First M87 Event Horizon Telescope Results. V. Physical Origin of the Asymmetric Ring*, EHT Collaboration (221 authors), *ApJL* 875, L5 (2019), arXiv:1906.11242,
28. *First M87 Event Horizon Telescope Results. IV. Imaging the Central Supermassive Black Hole*, EHT Collaboration (215 authors), *ApJL* 875, L4 (2019), arXiv:1906.11241,
27. *First M87 Event Horizon Telescope Results. III. Data Processing and Calibration*, EHT Collaboration (217 authors, paper coordinated by Blackburn, L., Issaoun, S., **Wielgus, M.**), *ApJL* 875, L3 (2019), arXiv:1906.11240,
26. *First M87 Event Horizon Telescope Results. II. Array and Instrumentation*, EHT Collaboration (341 authors), *ApJL* 875, L2 (2019), arXiv:1906.11239,
25. *First M87 Event Horizon Telescope Results. I. The Shadow of the Supermassive Black Hole*, EHT Collaboration (348 authors), *ApJL* 875, L1 (2019), arXiv:1906.11238,
24. *Multi-wavelength torus-jet model for Sagittarius A\**, Vincent, F., Abramowicz, M., Zdziarski, A., **Wielgus, M.**, Paumard, T., Perrin, G., Straub, O., *A&A* 624, A52 (2019), arXiv:1902.01175,
23. *The Size, Shape, and Scattering of Sagittarius A\* at 86 GHz: First VLBI with ALMA*, Issaoun, S., Johnson, M., Blackburn, L., + 41 authors, *ApJ* 871, 30 (2019), arXiv:1901.06226,
22. *Collisions of Neutron Stars with Primordial Black Holes as Fast Radio Bursts Engines*, Abramowicz, M., Bejger, M., **Wielgus, M.**, *ApJ* 868, 17 (2018), arXiv:1704.05931,
21. *Double Compton and Cyclo-Synchrotron in Super-Eddington Discs, Magnetized Coronae, and Jets*, McKinney, J. C., Chluba, J., **Wielgus, M.**, Narayan, R., Sądowski, A., *MNRAS* 467, 2241 (2017), arXiv:1608.08627,
20. *Radiative, two-temperature simulations of low-luminosity black hole accretion flows in general relativity*, Sądowski, A., **Wielgus, M.**, Narayan, R., Abarca, D., McKinney, J. C., Chael, A., *MNRAS* 466, 705 (2017), arXiv:1605.03184,
19. *Levitating atmospheres of Eddington-luminosity neutron stars*, **Wielgus, M.**, Sądowski, A., Kluźniak, W., Abramowicz, M., Narayan, R., *MNRAS*, 458, 3420 (2016), arXiv:1512.00094,
18. *Limits on thickness and efficiency of Polish doughnuts in application to the ULX sources*, **Wielgus, M.**, Yan, W., Lasota, J.-P., Abramowicz, M., *A&A* 587, A38 (2016), arXiv:1512.00749,
17. *Stable, levitating, optically thin atmospheres of Eddington-luminosity neutron stars*, **Wielgus, M.**, Kluźniak, W., Sądowski, A., Narayan, R., Abramowicz, M., *MNRAS* 454, 3766 (2015), arXiv:1505.06099,
16. *Two-frame tilt-shift error estimation and phase demodulation algorithm*, **Wielgus, M.**, Sunderland, Z., Patorski, K., *Optics Letters* 40, 3460 (2015),
15. *Local stability of strongly magnetized black hole tori*, **Wielgus, M.**, Fragile, P. C., Wang, Z., Wilson, J., *MNRAS* 447, 3593 (2015), arXiv:1412.4561,
14. *Cosmic background radiation in the vicinity of a Schwarzschild black hole: no classic firewall*, **Wielgus, M.**, Ellis, G. F. R., Vincent F., Abramowicz, M., *PRD* 90, 124024 (2014), arXiv:1406.6551,

13. *Continuous phase estimation from noisy fringe patterns based on the implicit smoothing splines*, **Wielgus, M.**, Patorski, K., Etchepareborda, P., Federico, A., Optics Express 22, 10775 (2014),
12. *Denoising and extracting background from fringe patterns using midpoint-based bidimensional empirical mode decomposition*, **Wielgus, M.**, Patorski, K., Applied Optics 53, B215 (2014),
11. *The perihelion of Mercury advance and the light bending calculated in (enhanced) Newton's theory*, Abramowicz, M., Ellis, G. F. R., Horák, J., **Wielgus, M.**, General Relativity and Gravitation 46:1630 (2014), arXiv:1303.5453,
10. *Nanocoral ZnO films fabricated on flexible poly(vinyl chloride) using a carrier substrate*, Borysiewicz, M., Wojciechowski, T., Dynowska, E., **Wielgus, M.**, Bar, J., Wojtowicz, T., Kamińska, E., Piotrowska, A., Thin Solid Films 550, 145 (2014),
9. *Advanced processing of optical fringe patterns by automated selective reconstruction and enhanced fast empirical mode decomposition*, Trusiak, M., **Wielgus, M.**, Patorski, K., Optics and Lasers in Engineering 52, 230 (2014),
8. *Escape, capture, and levitation of matter in Eddington outbursts*, Stahl, A., Kluźniak, W., **Wielgus, M.**, Abramowicz, M., A&A 555, A114 (2013), arXiv:1306.6556,
7. *AFM nanomoiré technique with phase multiplication*, Patorski, K., **Wielgus, M.**, Ekielski, M., Kaźmierczak, P., Measurement Science and Technology 24, 035402 (2013),
6. *Adaptive enhancement of optical fringe patterns by selective reconstruction using FABEMD algorithm and Hilbert spiral transform*, Trusiak, M., Patorski, K., **Wielgus, M.**, Optics Express 20, 23463 (2012),
5. *Oscillations of the Eddington capture sphere*, **Wielgus, M.**, Stahl, A., Abramowicz, M., Kluźniak, W., A&A 545, A123 (2012), arXiv:1208.2939,
4. *Eddington capture sphere around luminous stars*, Stahl A., **Wielgus, M.**, Abramowicz, M., Kluźniak, W., Yu, W., A&A 546, A54 (2012), arXiv:1208.2231,
3. *From porous to dense thin ZnO films through reactive DC sputter deposition onto Si (100) substrates*, Borysiewicz, M., Dynowska, E., Kolkovsky, V., Dyczewski, J., **Wielgus, M.**, Kamińska, E., Piotrowska, A., Physica Status Solidi A 209, 2463 (2012),
2. *Stability of radiation-pressure dominated disks. I. The dispersion relation for a delayed heating  $\alpha$ -viscosity prescription*, Ciesielski, A., **Wielgus, M.**, Kluźniak, W., Sądowski, A., Abramowicz, M., Lasota, J.-P., Rebusco, P., A&A 538, A148 (2012), arXiv:1106.2335,
1. *Evaluation of amplitude encoded fringe patterns using the bidimensional empirical mode decomposition and the 2D Hilbert transform generalizations*, **Wielgus, M.**, Patorski K., Applied Optics 50, 5513 (2011)

## Other publications

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31. *The Event Horizon Explorer mission concept*, Kurczynski, P., Johnson, M., Doeleman, S., + 41 authors, Proc. SPIE 12180 (121800M), Space Telescopes and Instrumentation (2022),
30. *First M87 Event Horizon Telescope Results and the Role of ALMA*, Goddi, C., Crew, G., Impellizzeri, V., + 42 authors, The Messenger 177, 25 (2019), arXiv:1910.10193,
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