

Maciek Wielgus

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EDUCATION

Warsaw University of Technology <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
Warsaw University of Technology <i>M.S. in Robotics and Automatic Control: Photonic Engineering (interferometric pattern analysis)</i>	Dec 2010
Warsaw University <i>B.S. in Mathematics: Numerical Analysis (partial differential equations)</i>	Sep 2010

PROFESSIONAL EXPERIENCE

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

RESEARCH INTERESTS

- 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

EHT Early Career Award (individual)	2020, 2021, and 2022
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

82 reviewed scientific journal papers (17 as a first author). 108 items **listed on ADS** (25 as a first author). 7766 citations, h-index=33, 65 papers cited at least 10 times (ADS, December 2022). Complete list of papers appended.

TALKS

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>Observing hot spots orbiting Sagittarius A* with ALMA and Chandra</i> Chandra X-ray Space Telescope Operations Control Center, Burlington, USA (invited)	Nov 2022
<i>Seeing the invisible: Imaging the supermassive black hole in the center of our Galaxy</i> 31st Texas Symp. on Relat. Astrophysics, Prague, Czechia (invited public outreach talk)	Sep 2022
<i>First image of the black hole shadow in Sagittarius A*</i> Paris Observatory, France (invited seminar)	Jul 2022

First image of the black hole shadow in Sagittarius A* KIPAC seminar, Stanford University (invited)	Jun 2022
Variability of the Sagittarius A* millimeter light curves 5th Black Hole Initiative Conference, Harvard University (invited)	May 2022
Observing AGN sources with the EHT AGN Seminar at NASA Goddard Space Flight Center, USA (invited)	Feb 2022
Would we know a wormhole if we saw one? 16th Marcel Grossmann Meeting (invited)	Jul 2021
Shadows of the past, shadows of the future 16th Marcel Grossmann Meeting (invited)	Jul 2021
Resolving the polarized emission from the core of the M87 galaxy with the EHT Los Alamos National Lab., Center for Theoretical Astrophysics, USA (invited seminar)	May 2021
Polarized emission around the M87 supermassive black hole SLAC seminar, Stanford University (invited)	Mar 2021

GRANTS AND FORMAL PROJECTS

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

TEACHING EXPERIENCE

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

OTHER ACTIVITIES

- o leading the EHT Time Domain Working Group 2018-2022
- o EHT Early Career Award 2020 "for his role and contributions to data processing, validation, and analysis of the 2017 EHT data, leading to the results published in the first six papers of the EHT"

- EHT Early Career Award 2021 "for his demonstration of the persistence of the M87 ring using years of historical EHT data"
- EHT Early Career Award 2022 "for his contribution to the calibration, analysis and interpretation of the EHT results of Sgr A*, and his leadership in the analysis and calibration of the ALMA data"
- one of the key contributors to the EHT data set reduction and inspection pipeline development
- paper coordinator for the collaboration paper EHTC, ApJL 875 L3 (2019)
- reviewer for MNRAS, A&A, ApJ, PRL, New Astronomy, Applied Optics, Optics Express, Optics Letters
- 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
- active popularizer of astronomy

LANGUAGES

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

Journal papers

87. *The Event Horizon Telescope Image of the Quasar NRAO 530*, Jorstad, S., **Wielgus, M.**, Lico, R., Issaoun, S. + EHTC, submitted to ApJ,
86. *Probing plasma composition with the next generation Event Horizon Telescope (ngEHT)*, Emami, R., Anantua, R., Ricarte, A., et al., submitted to Galaxies, arXiv:2211.07306,
85. *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, arXiv:2211.06773,
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. *Polarimetric signatures of hot spots in black hole accretion flows*, Vos, J., Moscibrodzka, M., and **Wielgus, M.**, accepted in A&A, arXiv:2209.09931,
81. *Photon ring test of the Kerr hypothesis: variation in the ring shape*, Pagnat, H., Lupsasca, A., Vincent, F., and **Wielgus, M.**, A&A 668, A11 (2022), arXiv:2206.02781,
80. *Images and photon ring signatures of thick disks around black holes*, Vincent, F., Gralla, S., Lupsasca, A., and **Wielgus, M.**, A&A 667, A170 (2022), arXiv:2206.12066,
79. *Collimation of the relativistic jet in the quasar 3C 273*, Okino, H., Akiyama, K., Asada, K., +32 authors, ApJ 940, 65 (2022), arXiv:2112.12233,
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., Paturski, 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 α -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

33. *The Event Horizon Explorer mission concept*, Kurczynski, P., Johnson, M., Doleman, S., + 41 authors, Proc. SPIE 12180 (121800M), Space Telescopes and Instrumentation (2022),
32. *Od obserwacji Eddingtona do obrazu czarnej dziury (From Eddington's observation to the shadow of a black hole)*, **Wielgus, M.**, Delta, March 2020, link,
31. *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,
30. *Studying black holes on horizon scales with space-VLBI*, Johnson, M., + 27 authors, Astro2020 white paper, arXiv:1909.01405,
29. *Extremely long baseline interferometry with Origins Space Telescope*, Pesce, D., Haworth, K., Melnick, G., Blackburn, L., **Wielgus, M.**, + 6 authors, Astro2020 white paper, arXiv:1909.01408,
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