

Maciek Wielgus

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EMPLOYMENT

Max Planck Institute for Radio Astronomy, Bonn, Germany <i>Research Scientist (reference: Anton Zensus)</i>	10.2021 – present
Harvard University, Cambridge, USA <i>Black Hole Initiative Postdoctoral Fellow (reference: Shep Doeleman)</i>	06.2017 – 08.2021
Nicolaus Copernicus Astronomical Center, Warsaw, Poland <i>Postdoctoral Researcher (reference: Włodek Kluźniak, Marek Abramowicz)</i>	01.2017 – 05.2017
Institute of Electron Technology, Warsaw, Poland <i>Engineer</i>	03.2011 – 09.2013

EDUCATION

Warsaw University of Technology <i>Ph.D. in Machine Design and Maintenance: Photonic Engineering (with a distinction)</i> Dissertation: Adaptive decomposition and analytic signal concept in the interferometric fringe pattern analysis	02.2011 – 09.2016
Warsaw University of Technology <i>M.S. in Robotics and Automatic Control: Photonic Engineering (interferometric fringe pattern analysis)</i>	10.2005 – 12.2010
Warsaw University <i>B.S. in Mathematics: Numerical Analysis (numerical partial differential equations)</i>	10.2007 – 09.2010

LONGER RESEARCH VISITS

Visiting Researcher at Paris Observatory <i>Paris Observatory Scientific Council grant, Meudon, France (reference: Frederic Vincent)</i>	07.2022, 06.2024
Visiting Researcher at University of Valencia <i>Valencia, Spain (reference: Ivan Marti-Vidal)</i>	03.2023
Confronting Theories of Accretion with Observations, KITP Program <i>Visiting Scholar, UCSB, Santa Barbara, USA</i>	02.2017 – 03.2017
Internship at Center for Astrophysics Harvard & Smithsonian <i>Cambridge, USA (mentors: Ramesh Narayan, Olek Sądowski)</i>	10.2015 – 12.2015
Visiting Scholar at Kavli Institute for Theoretical Physics, UCSB <i>Santa Barbara, USA (mentors: Omer Blaes, Włodek Kluźniak)</i>	06.2015
Visiting Scholar at Peking University Kavli Institute for Astronomy and Astrophysics <i>Beijing, China (mentors: Marek Abramowicz, Fukun Liu)</i>	08.2014
Visiting Scholar at University of Capetown <i>Capetown, South Africa (mentor: George F. R. Ellis)</i>	05.2014
Internship at National Center of the Industrial Technology <i>Buenos Aires, Argentina (mentors: Guillermo Kaufmann, Alejandro Federico)</i>	10.2013 – 11.2013
Internship at Center for Astrophysics Harvard & Smithsonian <i>Cambridge, USA (mentors: Ramesh Narayan, Olek Sądowski)</i>	06.2013 – 08.2013
Internship at College of Charleston <i>Charleston, USA (mentor: Chris Fragile)</i>	05.2013 – 06.2013

RESEARCH INTERESTS

- astrophysics of compact objects
- very long baseline radio interferometry
- physics of accretion and AGN jets
- machine learning and AI for research in astronomy
- Event Horizon Telescope project
- observational tests of general relativity
- magnetohydrodynamics
- applied signal and image processing

AWARDS

EHT Early Career Award (individual)	2020, 2021, 2022, 2023
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 "Young Innovators" for the best PhD Thesis	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
First degree scientific performance team award from the President of the Warsaw University of Technology	2014
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
Distinction in the PKOpto XXth prof. A. Smolinski national competition for the best master thesis in optoelectronics	2011
Laureate (6th place nationwide) of the National Mathematics Competition for high school students in Poland	2005

BIBLIOMETRICS

113 published or accepted reviewed journal papers, 140 items **listed on ADS** with 14281 citations, h-index=44, and 92 items cited at least 10 times (ADS, September 2024). 26 **ADS-listed** publications as a first author (including 18 reviewed journal papers), with a total of 546 citations, h-index=13, and 15 papers cited at least 10 times (ADS, September 2024). 43 reviewed journal papers as a first, second, or third author.

GRANTS AND FORMAL PROJECTS

M2FINDERS: Mapping Magnetic Fields with INterf. Down to Event hoRizon Scales <i>ERC Advanced grant. Leader of 1/3 Working Packages. PI: J. Anton Zensus</i>	2021 – 2026
Foreign Expert: Transformation of the form and method of education <i>at the Silesian University in Opava, Czechia</i>	2022 – 2024
PI: Dynamics of the Centaurus A jet base on a light-day scale	2022

ALMA cycle 8 VLBI observations

Co-PI: Probing relativistic jets through mm-VLBI of X-ray binaries 2022

GMVA VLBI observations, PI: Alex Tetarenko

Co-PI: Ultra-high resolution imaging of 3C84 2022

ALMA cycle 8 VLBI observations

PI: Thin disks GRRMHD simulations 2018 – 2022

3×10^7 CPU hours on PROMETHEUS supercomputer from PLGRID

Named participant: Variable accretion flows 2013 – 2018

Polish National Science Center Maestro Grant, PI: Wlodek Kluźniak

Co-PI: Adaptive processing of fringe patterns in optical whole-field measurements 2013 – 2015

Polish National Science Center Opus Grant, PI: Krzysztof Paturski

PI: Advanced single-frame fringe processing algorithms 2012 – 2013

Dean's Grant at the Faculty of Mechatronics, Warsaw University of Technology

PI: Automatic image analysis for nanomaterials research 2012 – 2014

Foundation for Polish Science VENTURES Grant

Named participant: Turbulent viscosity in non-stationary black hole accretion disks 2012 – 2014

Polish National Science Center Opus Grant, PI: Marek Abramowicz

OTHER ACTIVITIES

- leading the EHT Time Domain Working Group 2018-2022
- 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"
- EHT Early Career Award 2023 "for a leading role in analysis of NRAO 530 and J1924-2914 observations"
- key contributor to the EHT data set reduction and inspection pipeline development
- paper coordinator for the collaboration paper EHTC, ApJL 875 L3 (2019)
- key contributor and paper writing team member for a number of alphabetic-author-list EHT publications
- 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
- mentoring multiple PhD and undergraduate students on their research projects: J. Vos, J. Roeder, W. Yan, D. Bollimpalli, S. Steel, D. Lancova, A. Yfantis, among others
- PhD co-supervisor of A. Yfantis at Radboud University, Netherlands (2024)
- jury member, MSc defence of L. F. Dias da Silva at Lisbon University (2024)
- named participant on tens of radio/VLBI observational proposals with EHT, GMVA, LMT, ALMA
- reviewer of grant proposals at the Czech Science Foundation in the Astronomy panel
- member of the Polish Astronomical Society and the European Astronomical Society
- active popularizer of astronomy

TEACHING EXPERIENCE

Lecturer of astrophysics at the Relativistic Accretion Workshop, University of Bremen 09.2016

Transonic flows, ideal MHD, MRI

Teaching at Warsaw University of Technology 2011 – 2015

Optomechatronics lab, Mechatronic systems lab, and Instrumental optics lab

Teaching assistant and tutor at Warsaw University 2010 – 2011

Calculus I & II, linear algebra for math students

LANGUAGES

- Polish (native)
- English (fluent)
- Spanish (A2, learning in progress)

SELECTED RECENT PROFESSIONAL TALKS

I have given 100+ professional talks and presentations. Some recent talks below, full list on wielgus.info

20. 2024-07-19, COSPAR 2024: 45th Scientific Assembly, Busan, South Korea (invited talk),
19. 2024-06-20, Physics Department, Ecole Normale Supérieure, Paris, France (invited talk),
18. 2024-03-11, ASIAA, Taipei, Taiwan (invited seminar),
17. 2023-11-29, 25th RAGtime Meeting, Opava, Czechia (keynote conference talk),
16. 2023-10-16, Harvard/SAO/EHT Group Meeting, Cambridge, USA (invited seminar),
15. 2023-07-14, EAS Meeting 2023, Krakow, Poland (invited),
14. 2023-05-09, Goethe University, Frankfurt, Germany (invited seminar),
13. 2023-05-02, Radboud University, Nijmegen, Netherlands (invited seminar),
12. 2023-04-18, University of Geneva, Switzerland (invited seminar),
11. 2023-03-14, University of Valencia, Spain (invited seminar),
10. 2023-02-10, Improving Accretion Models with Plasma Theory workshop, Princeton, USA (invited),
9. 2023-01-12, Reconnection and Sgr A* flares workshop, Paris Observatory, Meudon, France (invited),
8. 2022-11-29, Astronomical Observatory of the University of Warsaw, Poland (invited seminar),
7. 2022-11-10, Chandra X-ray Space Telescope Operations Control Center, Burlington, USA (invited seminar),
6. 2022-11-02, HEAD CfA | Harvard & Smithsonian, Cambridge, USA (invited seminar),
5. 2022-09-14, 31st Texas Symposium on Relativistic Astrophysics, Prague, Czechia,
4. 2022-08-22, Max Planck Institute for Extraterrestrial Physics, Garching, Germany (invited seminar),
3. 2022-07-07, Paris Observatory, France (invited seminar),
2. 2022-06-09, KIPAC, Stanford University, USA (invited seminar, online),
1. 2022-05-20, 5th Black Hole Initiative Conference, Harvard University, USA (invited),

OUTREACH TALKS AND LECTURES 2019+

17. 2023-09-02, Astronomy Club Almukantarat 40th Anniversary, Frombork, Poland,
16. 2022-12-09, Astronomy Club at Sacred Heart Preparatory, Atherton, USA (online),
15. 2022-09-13, 31st Texas Symposium on Relativistic Astrophysics, Prague, Czechia (public talk),
14. 2022-05-17, Harvard University Science Center, Cambridge, USA (public talk and panel discussion),
13. 2021-11-17, XL Żeromski High School, Warsaw, Poland (invited talk for high school students),
12. 2021-07-16, Almukantarat Astronomy Club Summer Camp, Zalecze Wielkie, Poland (popular lecture),
11. 2021-03-29, N. Copernicus Astronomy Center: Meetings with Astronomy (outreach lecture series),
10. 2021-01-21, Copernicus Science Center, Warsaw, Poland (public lecture),
9. 2020-11-30, Photo: Science/Photography and Scientific Discourses, Prague, Czechia (keynote talk),
8. 2020-09-20, N. Copernicus Astronomy Center: Meetings with Astronomy (outreach lecture series),
7. 2020-03-04, Silesian University in Opava, Czechia (public lecture),
6. 2019-11-06, Mellow Mushroom pub, Charleston, USA (Astronomy on Tap pub talk),
5. 2019-09-23, PLNOG 23, Cracow, Poland (invited lecture at an IT conference),
4. 2019-09-14, PyCon PL 2019, Zawiercie, Poland (keynote lecture at an IT conference),
3. 2019-07-31, Polish Scientific Network in Boston meeting, MIT, Cambridge, USA (popular talk),
2. 2019-04-27, Copernicus Science Center, Warsaw, Poland (public talk),
1. 2019-04-15, Harvard University Science Center, USA (public talk and panel discussion)