List of scientific achievements

Izabela Kowalska-Leszczyńska
Centrum Badań Kosmicznych
Polska Akademia Nauk

Warszawa 2023

I. INFORMATION ON SCIENTIFIC OR ARTISTIC ACHIEVEMENTS SET OUT IN ART. 219 PARA 1. POINT 2 OF THE ACT

1. ~~Scientific monograph, pursuant to art. 219 para 1. point 2a of the Act; or~~
2. Cycle of scientific articles related thematically, pursuant to art. 219 para 1. point 2b of the Act; or;

IKL1: Evolution of the Solar Lyα Line Profile during the Solar Cycle

---

Kowalska-Leszczynska, I.; Bzowski, M.; Sokół, J. M.; Kubiak, M. A.

The Astrophysical Journal, Vol. 852, Issue 2, article id. 115, 14 pp. (2018)

DOI: 10.3847/1538-4357/aa9f2a

IKL2: Evolution of the Solar Lyα Line Profile during the Solar Cycle. II. How Accurate Is the Present Radiation Pressure Paradigm for Interstellar Neutral H in the Heliosphere?

Kowalska-Leszczynska, I.; Bzowski, M.; Sokół, J. M.; Kubiak, M. A.

The Astrophysical Journal, Vol. 868, Issue 1, article id. 49, 14 pp. (2018)

DOI: 10.3847/1538-4357/aae70b

IKL3: Update of the Solar Lyα Profile Line Model

Kowalska-Leszczynska, I.; Bzowski, M.; Kubiak, M. A.; Sokół, J. M.

The Astrophysical Journal Supplement Series, Vol. 247, Issue 2, article id. 62 (2020).

DOI: 10.3847/1538-4365/ab7b77

IKL4: Absorption of the Lyman-α radiation in the heliosphere

Kowalska-Leszczynska, I.; Kubiak, M. A.; Bzowski, M.

The Astrophysical Journal, Volume 926, Number 1 (2022)

DOI: 10.3847/1538-4357/ac4092

IKL5: Radiation pressure acting on the neutral He atoms in the Heliosphere

---

Kowalska-Leszczynska, I.; Kubiak, M. A.; Bzowski, M.

The Astrophysical Journal, Volume 950, Number 2 (2023)

DOI: 10.3847/1538-4357/acd18f

~~3. List of completed original project, engineering and design, technological or artistic achievements, pursuant to art. 219 para 1. point 2c of the Act.~~

II. INFORMATION ON SCIENTIFIC OR ARTISTIC ACTIVITY

~~1. List of published scientific monographs (including the monographs not mentioned in section I.1).~~

~~2. List of published chapters in scientific monographs.~~

~~3. Information about membership in editorial boards preparing scientific monographs for publication.~~

4. List of articles published in scientific journals (including the articles not mentioned in section I.2).

Post-PhD publications

1. Radiation pressure acting on the neutral He atoms in the Heliosphere

Kowalska-Leszczynska, I.; Kubiak, M. A.; Bzowski, M.
The Astrophysical Journal, Volume 950, Number 2 (2023)
DOI: 10.3847/1538-4357/acd18f

2. ♦ One Solar Cycle of Heliosphere Observations with the Interstellar Boundary Explorer: Energetic Neutral Hydrogen Atoms Observed with IBEX-Lo from 10 eV to 2 keV

Galli, A.; Wurz, P.; Schwadron, N. A.; Fairchild, K.; Heirtzler, D.; Möbius, E.; Kucharek, H.; Winslow, R.; Bzowski, M.; Kubiak, M. A.; Kowalska-Leszczyńska, I.; Fuselier, S. A.; Sokół, M. J.; Swaczyna, P. and McComas, D. J.
The Astrophysical Journal Supplement Series, Vol. 261, Issue 2, id. 18, 21 pp. (2022)
DOI: 10.3847/1538-4365/ac69c9

3. Absorption of the Lyman-α radiation in the heliosphere

Kowalska-Leszczynska, I.; Kubiak, M. A.; Bzowski, M.
The Astrophysical Journal, Volume 926, Number 1 (2022)
DOI: 10.3847/1538-4357/ac4092

4. ♦ WawHelioGlow: A Model of the Heliospheric Backscatter Glow. I. Model Definition

Kubiak, M. A.; Bzowski, M.; Kowalska-Leszczynska, I.; Strumik, M.
The Astrophysical Journal Supplement Series, Vol. 254, Issue 1, id.16, 14 pp. (2021)
DOI: 10.3847/1538-4365/abeb79

5. ♦ WawHelioGlow: A Model of the Heliospheric Backscatter Glow. II. The Helioglow Buildup and the Potential Significance of the Anisotropy in the Solar EUV Output

Kubiak, M. A.; Bzowski, M.; Kowalska-Leszczynska, I.; Strumik, M.
The Astrophysical Journal Supplement Series, Vol. 254, Issue 1, id.17, 20 pp. (2021).
DOI: 10.3847/1538-4365/abeb78

6. ♦ Density of Neutral Hydrogen in the Sun's Interstellar Neighborhood

Swaczyna, P.; McComas, D. J.; Zirnstein, E. J.; Sokół, J. M.; Elliott, H. A.; Bzowski, M.; Kubiak, M. A.; Richardson, J. D.; Kowalska-Leszczynska, I.; Stern, S. A.; Weaver, H. A. ; Olkin, C. B.; Singer, K. N.; Spencer, J. R.
The Astrophysical Journal, Volume 903, Issue 1, id.48, 11 pp (2020).
DOI: 10.3847/1538-4357/abb80a

7. ♦ Inferring Contributions from Unresolved Point Sources to Diffuse Emissions Measured in UV Sky Surveys: General Method and SOHO/SWAN Case Study

Strumik, M.; Bzowski, M.; Kowalska-Leszczynska, I.; Kubiak, M. A.
The Astrophysical Journal, Volume 899, Issue 1, id.48 (2020).
DOI: 10.3847/1538-4357/ab9e6f

8. ♦ Solar Cycle of Imaging the Global Heliosphere: Interstellar Boundary Explorer (IBEX) Observations from 2009-2019

McComas, D. J.; Bzowski, M.; Dayeh, M. A.; DeMajistre, R.; Funsten, H. O.; Janzen, P. H.; Kowalska-Leszczyńska, I.; Kubiak, M. A.; Schwadron, N. A.; Sokół, J. M.; Szalay, J. R.; Tokumaru, M.; Zirnstein, E. J.
The Astrophysical Journal Supplement Series, Volume 248, Issue 2, id.26 (2020)
DOI: 10.3847/1538-4365/ab8dc2

9. Update of the Solar Lyα Profile Line Model

Kowalska-Leszczynska, I.; Bzowski, M.; Kubiak, M. A.; Sokół, J. M.
The Astrophysical Journal Supplement Series, Vol. 247, Issue 2, article id. 62 (2020).
DOI: 10.3847/1538-4365/ab7b77

10. ♦ Radiation Pressure from Interstellar Hydrogen Observed by IBEX through Solar Cycle 24

Rahmanifard, F.; Möbius, E.; Schwadron, N. A.; Galli, A.; Richards, N.; Kucharek, H.; Sokół, J. M.; Heirtzler, D.; Lee, M. A.; Bzowski, M.; Kowalska-Leszczynska, I.; Kubiak, M. A.; Wurz, P.; Fuselier, S. A.; McComas, D. J.

The Astrophysical Journal, Volume 887, Issue 2, article id. 217, 12 pp. (2019).
DOI: 10.3847/1538-4357/ab58ce

11. ♦ Model-free Maps of Interstellar Neutral Hydrogen Measured with IBEX between 2009 and 2018

Galli, A.; Wurz, P.; Rahmanifard, F.; Möbius, E.; Schwadron, N. A.; Kucharek, H.; Heirtzler, D.; Fairchild, K.; Bzowski, M.; Kubiak, M. A.; Kowalska-Leszczynska, I.; Sokół, J. M.; Fuselier, S. A.; Swaczyna, P.; McComas, D. J.

The Astrophysical Journal, Volume 871, Issue 1, article id. 52, 18 pp. (2019)
DOI: 10.3847/1538-4357/aaf737

12. Evolution of the Solar Lyα Line Profile during the Solar Cycle. II. How Accurate Is the Present Radiation Pressure Paradigm for Interstellar Neutral H in the Heliosphere?

Kowalska-Leszczynska, I.; Bzowski, M.; Sokół, J. M.; Kubiak, M. A.

The Astrophysical Journal, Volume 868, Issue 1, article id. 49, 14 pp. (2018)
DOI: 10.3847/1538-4357/aae70b

13. Evolution of the Solar Lyα Line Profile during the Solar Cycle

Kowalska-Leszczynska, I.; Bzowski, M.; Sokół, J. M.; Kubiak, M. A.

The Astrophysical Journal, Volume 852, Issue 2, article id. 115, 14 pp. (2018)
DOI: 10.3847/1538-4357/aa9f2a

14. ♦ A New View on the Maximum Mass of Differentially Rotating Neutron Stars

Gondek-Rosińska, D.; Kowalska, I.; Villain, L.; Ansorg, M.; Kucaba, M.

The Astrophysical Journal, Volume 837, Issue 1, article id. 58, 14 pp. (2017)
DOI: 10.3847/1538-4357/aa56c1

15. ♦ Globally coherent short duration magnetic field transients and their effect on ground based gravitational-wave detectors

Kowalska-Leszczynska, I.; Bizouard, M. A.; Bulik, T.; Christensen, N.; Coughlin, M.; Gołkowski, M.; Kubisz, J.; Kulak, A.; Mlynarczyk, J.; Robinet, F.; Rohde, M.
Classical and Quantum Gravity, Volume 34, Issue 7, article id. 074002 (2017)
DOI: 10.1088/1361-6382/aa60eb

16. ♦ Observation of Gravitational Waves from a Binary Black Hole Merger

LIGO and VIRGO Collaboration
Physical Review Letters, Volume 116, Issue 6, id.061102 (2016)
DOI: 10.1103/PhysRevLett.116.061102

17. ♦ Effect of metallicity on the gravitational-wave signal from the cosmological population of compact binary coalescences

Kowalska-Leszczynska, I.; Regimbau, T.; Bulik, T.; Dominik, M.; Belczynski, K.
Astronomy & Astrophysics, Volume 574, id.A58, 9 pp. (2015)
DOI: 10.1051/0004-6361/201424417

Pre-PhD publicatoions

18. ♦ Search for gravitational waves from binary black hole inspiral, merger, and ringdown in LIGO-Virgo data from 2009-2010

LIGO and VIRGO Collaboration
Physical Review D, vol. 87, Issue 2, id. 022002 (2013)
DOI: 10.1103/PhysRevD.87.022002

19. ♦ Gravitational wave background from Population III binaries

Kowalska, I.; Bulik, T.; Belczynski, K.
Astronomy & Astrophysics, Volume 541, id.A120, 6 pp. (2012)
DOI: 10.1051/0004-6361/201118604

20. ♦ The eccentricity distribution of compact binaries

Kowalska, I.; Bulik, T.; Belczynski, K.; Dominik, M.; Gondek-Rosinska, D.
Astronomy & Astrophysics, Volume 527, id.A70, 7 pp. (2011)
DOI: 10.1051/0004-6361/201015777

21. ♦ X-ray-emitting GHz-peaked-spectrum Galaxies: Testing a Dynamical-Radiative Model with Broadband Spectra

Ostorero, L.; Moderski, R.; Stawarz, Ł.; Diaferio, A.; Kowalska, I.; Cheung, C. C.; Kataoka, J.; Begelman, M. C.; Wagner, S. J.
The Astrophysical Journal, Volume 715, Issue 2, pp. 1071-1093 (2010)
DOI: 10.1088/0004-637X/715/2/1071

22. ♦ Modelling the broad-band spectra of X-ray emitting GPS galaxies

Ostorero, L.; Moderski, R.; Stawarz, Ł.; Begelman, M. C.; Diaferio, A.; Kowalska, I.; Kataoka, J.; Wagner, S. J.
Astronomische Nachrichten, Vol.330, Issue , p.275 (2009)
DOI: 10.1002/asna.200811174

23. ♦ How to estimate the distance to the warm absorber in AGN from photoionized models

Różańska, A.; Kowalska, I.; Gonçalves, A. C.
Astronomy & Astrophysics, Volume 487, Issue 3, pp.895-900 (2008)
DOI: 10.1051/0004-6361:200809549

LIGO/Virgo publications

As a member of the LIGO/Virgo gravitational wave detection collaboration, I was a co-author on additional publications that were not listed above due to my minimal contribution to their creation process.

The complete list of my publications, along with the citation count from the Web of Science, can be found in the attachment "publication_list_WoS."

~~5. List of project, engineering and design as well as technological achievements (including the achievements not mentioned in section I.3).~~

~~6. List of public realizations of works of art (including the works not mentioned in section I.3).~~

7. Information on presentations given at national or international scientific or arts conferences, including a list of lectures delivered upon invitation and plenary lectures.

Designations:

P* - Poster presentation

P - Co-authorship of a poster presented by another team member

W* - Oral presentation

W - Co-authorship of an oral presentation given by another team member

Post-PhD presentations

Conference	Title	Role
AGU Fall Meeting Chicago, USA 12-16.12.2022	*Influence of the Sun's active regions on the hydrogen backscatter glow*	P*
	Interstellar neutral observation opportunities from IBEX-Lo to IMA-Lo	P
	Distributions of neutral hydrogen and helium in the solar wind	P
	Extra-heliospheric background near the Lyman-alpha wavelength as revealed by cross-analysis of SOHO/SWAN maps, IUE observations, and WawHelioGlow modeling results	P
Annual International Astrophysics Conference Santa Fe, USA 31.10-04.11.2022	*Contributions of the extra-heliospheric background, solar UV-output anisotropy and multiple scattering effects to the heliospheric Lyman-alpha glow observed at 1 AU from the Sun*	W
44th COSPAR Athens, Greece 17-24.07.2022	*Optical thickness of the Heliosphere in Lyman-α wavelength*	W*
	Comprehensive suite for modeling neutral atoms in the heliosphere: WTPM, WawHelioIon, WawHelioGlow	W
	New model of the heliospheric backscatter glow of H (WawHelioGlow), and its sensitivity to solar and interstellar factors	P
IBEX/IMAP Meeting Laurel, USA 13-17.06.2021	*Radiation pressure – consequences for observed IBEX-Lo flux*	W*
	SOHO/SWAN observations of the helioglow vs WawHelioGlow simulations with anisotropic solar UV output and solar-sind structure: a possibility of understanding observations without multiple photon scattering effects	W
Polish Astronomical Society Meeting Szczecin, Poland 13-17.09.2021	*The solar Lyman-α line – why is it so important in heliospheric studies?*	W*
IBEX/IMAP Meeting Online 16 -19.06.2021	*Absorption of the Lyman-α radiation in heliosphere*	W*
43rd COSPAR Online 28.01-04.02.2021	*Absorption of the Lyman-alpha radiation*	W*

Interstellar Probe Workshop Online 17-19.11.2020	*Absorption of the Lyman-alpha radiation in Heliosphere*	P*
AGU Fall Meeting San Francisco, USA 09-13.12.2019	*Proxy model of the daily solar irradiance in EUV*	P*
	Contributions from unresolved point sources in observations if the heliospheric glow	P
Astronomical Obserwatory Seminares 15.10.2019	*Heliosphere – how we explore it*	W*
IBEX/IMAP Meeting Santa Fe, USA 16-25.06.2019	*Astrophysical Lyman-alpha Sources - How will GLOWS See and Use Them*	W*
	SOHO/SWAN and Mariner measurements of the heliospheric backscatter glow vs. numerical modeling results: Separation of the contributions from the heliospheric Lyman-alpha glow and UV point sources	W
Space Research Centre Seminaries 28.03.2019	*The new radiation pressure model and it's consequences for the Heliosphere.*	W*
Annual International Astrophysics Conference Pasadena, USA 18-20.02.2019	*Radiation pressure from IBEX observations of the interstellar hydrogen trough Solar Cycle 24*	W
AGU Fall Meeting Washington, USA 10-14.12.2018	*Science opportunities from simultaneous observations of the heliospheric hydrogen and helium backscatter glows*	P*
IBEX/IMAP Meeting Princeton, USA 26.08-01.09.2018	*Model of the ISN H flux, speed and energy impacting the IBEX-Lo detector*	W*
	The sensitivity of ISN H and derivative populations to radiation pressure model	W*
	Pickup ion density at the termination shock	W
Solar Wind 15 Brussels, Belgium 18-23.07.2018	*Solar (wind) influence on interstellar pickup ion population in the heliosphere*	P
	Solar modulation of interstellar H, O, Ne, and He in the heliosphere	P

42th COSPAR Pasadena, USA 14-22.07.2018	*The not so fast and furious – what can low energetic neutral atoms and interstellar neutral hydrogen tell us about the heliosphere?*	W
European Geophysical Union Assemble Viena, Austria 04-13.04.2018	*Interstellar neutral hydrogen: Eight years of IBEX-Lo observations*	W
Annual International Astrophysics Conference Santa Fe, USA 04-09.03.2018	*Solar modulation of interstellar neutral gas species inside the heliosphere*	W
IAU Symposium Jaipur, India 19-24.02.2018	*Solar activity affecting the heliosphere and heliospheric particle populations*	P
	Modulation of interstellar gas and heliospheric backscatter glow due to variation in solar activity	P
AGU Fall Meeting New Orleans, USA 11-15.12.2017	*Observation-based Model of Evolution of the Lyman-α Line Profile During the Solar Cycle*	P*
IBEX Meeting Warsaw, Poland 28-30.06.2017	*Model of Lyman-α profile*	W*
LIGO/Virgo Meeting Pasadena, USA 14-18.03.2016	*Schumann resonances and their effect on LIGO/Virgo data*	W*
Rencontres de Moriond La Thuile, Italy 22-28.03.2015	*Constraining the distance to inspiralling binaries with Einstein Telescope.*	W*
1st Conference of Polish Society on Relativity Spała, Poland 29.06-04.07.2014	*Gravitational waves background from compact binaries*	W*

Pre-PhD presentations

Conference	Title	Role
Gravitational-Wave Physics and Astronomy Workshop Hanover, Germany 04-07.06.2012	*Gravitational wave background from population III binaries*	P*
Rencontres de Moriond La Thuile, Italy 21-27.03.2011	*The eccentricity distribution of compact binaries*	W*
Gravitational-Wave Physics and Astronomy Workshop Milwaukee, USA 26-29.01.2011	*The eccentricity distribution of compact binaries*	P*

8. Information on participation in organizational and scientific committees at national or international conferences, including the applicant's function.

Date	Conference	Role
28-30.06.2017	IBEX Science Team Meeting, Warsaw	member of the local organizing committee
20-24.09.2010	LIGO/Virgo Meeting, Krakow	member of the local organizing committee

9. Information on participation in the works of research teams realizing projects financed through national and international competitions, including the projects which have been completed and projects in progress, and information on the function performed in the team.

Year	Project No	Title	Role
2021-	MEiN/2021/2/DIR (ongoing)	GLOWS	team member
2019-2023	UMO-2018/31/D/ST9/02852 (ongoing)	Solar wind structure – who is right?	PI

2015-2018	UMO-2014/14/M/ST9/00707 (completed)	Polish participation in Virgo project	team member
2013-2016	UMO-2013/01/ASPERA/ST9/00001 (completed)	Research and development of the Einstein Telescope	team member
2011-2015	2011/01/N/ST9/03171 (completed)	Application of gravitational wave detectors in astrophysics and cosmology	PI

10. Membership in international or national organizations and scientific societies, including the functions performed by the applicant.
    - American Geophysical Union – member
    - COSPAR - associate
11. Information on internships completed in scientific or artistic institutions, also abroad, including the place, time and duration of the internship and its character.

Date	Country	Institution	Purpose
11-17.06.2011	France	Observatoire de la Côte d'Azur Laboratoire Artemis	writing publication
24-29.08.2009	Italy	The European Gravitational Observatory	observation duty
04-10.01.2009	France	Le Laboratoire d'Annecy-le-Vieux de Physique des Particules (LAPP)	data analyzis training
25.06 -15.09.2007	Poland	Nicolaus Copernicus Astronomical Center, PAS (CAMK)	summer internship
24.07 -18.08.2006	Poland	Nicolaus Copernicus Astronomical Center, PAS (CAMK)	summer internship

12. ~~Membership in editorial committees and scientific boards of journals, including the functions performed by the applicant (e.g. editor-in-chief, chairman of scientific board etc.)~~
13. Information on scientific or artistic works reviewed, in particular those published in international journals.
    - All of my publications listed in II.4 are reviewed.

14. Information on participation in European or other international programs.
    - 2018-present: Member of the IBEX-Lo scientific team.
    - 2018-present: Member of the GLOWS scientific team.
    - 2013-2016: Member of the Einstein Telescope scientific team.
    - 2009-2016: Member of the Virgo scientific team.
15. Information on participation in research teams realizing projects other than those defined in section II.9.

Year	Project No	Title	Role
2022-	ISSI #541 (ongoing)	Distribution of interstellar neutral hydrogen in the Sun's neighborhood	team member

16. Information on membership in the teams assessing applications for financing of research projects, applications for scientific awards, and applications in other competitions of scientific or didactic character.

Date	Event	Role
01.04.2022	Final of the competition Cosmic Challenge: Curiosity	jury member
16.12.2021	Final of the competition Cosmic Challenge: Voyager	jury member
17.05.2021	Final of the competition Cosmic Challenge: 2nd edition	jury member
15.09.2020	Final of the competition Cosmic Challenge: 1st edition	jury member

III. SCIENTOMETRIC INFORMATION

Based on Web of Science (15.06.2023).

	All	Without LIGO/Virgo
Total citations	15 937	320
Without self-citations	15 461	287
Hirsch Index	51	11

Izabela Kowalska-Leszczyńska

Elektronicznie podpisany przez Izabela Kowalska-Leszczyńska
Data: 2023.06.28 10:24:47 +02'00'

……

(applicant's signature)