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Nationality: Polish

Katarzyna Frankiewicz

Interests

- Science education and outreach
- Development of educational programs for high school and university students
- Dark matter, neutrino physics and nuclear nonproliferation

Education

2013 - 2018 **Ph.D. in Physics, Nuclear and Particle Physics**, *National Centre for Nuclear Research*, Poland, *completed with honors*

Thesis title *Indirect Search for Dark Matter with the Super-Kamiokande Detector*

Advisors Ewa Rondio, Piotr Mijakowski

2011 - 2013 **M.Sc. in Physics, Nuclear and Particle Physics**, *University of Warsaw*, Poland, *Summa cum laude*

Thesis title *Search for Dark Matter Particles with the Super-Kamiokande Detector*

Advisors Katarzyna Grzelak, Piotr Mijakowski

2008 - 2012 **B.Sc. in Astronomy**, *University of Warsaw*, Poland

Thesis title *Direct and Indirect Methods of Dark Matter Detection*

Advisor Michał Jaroszyński

2008 - 2011 **B.Sc. in Physics**, *University of Warsaw*, Poland

Thesis title *Analysis of Armenteros plot for K^0 and Λ^0 data from the Compass experiment at CERN*

Advisor Barbara Badełek

Research Positions

2022 - 2023 **Maternity Leave**

2019 - 2022 **Postdoctoral Research Associate**, *Department of Physics, Boston University*, Boston, MA

Advisor Christopher Grant

Projects SNO+, WATCHMAN, THEIA

Detector R&D including new light collection methods; Event reconstruction in gadolinium-doped water and water-based liquid scintillator; Te-loaded liquid scintillator properties and monitoring; High voltage systems.

Mentoring undergraduate and graduate students, supporting coordination of the neutrino research group.

2018 - 2019 **Physicist**, *National Centre for Nuclear Research*, Warsaw, Poland

Projects Super-Kamiokande, Hyper-Kamiokande

Collaboration with Education and Training Division.

Related Professional Experience

2019 - 2020 **Lawrence Livermore National Laboratory (LLNL)**, *Visiting scholar (3 weeks)*, R&D for WATCHMAN detector, supervisor: Adam Bernstein

2013 - 2018 **Kamioka Observatory, Institute for Cosmic Ray Research (ICRR)**, *Research activities (7 months in total) including Super-Kamiokande detector refurbishment in 2018*

2017 - 2018 **Wisconsin IceCube Particle Astrophysics Center (WIPAC)**, *Visiting scholar, mentor during WIPAC-QuarkNet internship, instructor during ALPhA's Laboratory Immersions (12 weeks)*

2016 **Fermi National Accelerator Laboratory (Fermilab)**, *Visiting Scholar (2 weeks)*, Dark matter searches, supervisor: Edward Kearns

2016 - 2017 **Boston University**, *Visiting Scholar (8 weeks)*, Indirect dark matter searches, supervisor: Edward Kearns

2013 **European Organization for Nuclear Research (CERN)**, *Summer Student Programme (12 weeks)*, Jet structure in heavy-ion collisions within ALICE experiment, supervisor: Mateusz Ploskon

2011 **European Organization for Nuclear Research (CERN)**, *Student internship (3 weeks)*, COMPASS detector control system, supervisor: Ana Sofia Nunes

2010 **Space Research Centre of the Polish Academy of Sciences**, *Student internship (4 weeks)*, Stellar occultations by Kuiper Belt objects, supervisor: Małogorzata Królikowska-Sołtan

2010 **European Organization for Nuclear Research (CERN)**, *Student internship (3 weeks)*, COMPASS detector performance, supervisor: Barbara Badełek

Professional Training

2023 **An Introduction to Evidence-Based Undergraduate STEM Teaching**, *online course by Cornell University, (8 weeks)*, edX.org

2023 **Uncommon Sense Teaching Specialization**, *online courses by Deep Teaching Solutions, (8 weeks)*, Cousera.org

2023 **Active Learning in STEM with PhET Interactive Simulations Specialization**, *online courses by University of Colorado Boulder, (8 weeks)*, Coursera.org

2022 **Art of Teaching: Best Practices from a Master Educator**, *online lectures by Patrick N. Allitt, Emory University*, The Great Courses

2020 **200 Hour Yoga Teacher Training**, *Yoga teacher certificate*, Down Under School of Yoga, Boston, MA

2016 **PhyStat-nu**, *Workshop on Statistical Issues in Experimental Neutrino Physics*, Fermi National Accelerator Laboratory, Batavia, IL

2015 **The Universe of Neutrinos**, *SLAC Summer Institute*, SLAC National Accelerator Laboratory, Menlo Park, CA

2014 **Invisibles**, *PhD school*, Centre National de la Recherche Scientifique (CNRS), Gif-sur-Yvette, France

2014 **Neutrinos Underground & in the Heavens**, *PhD school*, The Niels Bohr International Academy, Copenhagen, Denmark

Scholarships, Awards, and Grants

Poster Prize (1st place), Neutrino 2018 Conference.

The Teaching and Popularization Award funded by National Centre for Nuclear Research, Poland, awarded in 2018.

Distinguished Poster Award, ICHEP 2016 Conference.

PRELUDIUM: Pre-Doctoral Grant (2015/17/N/ST2/04064), funded by National Science Centre in Poland, Principal Investigator.

Grant for Young Physicists funded by Istituto Nazionale di Fisica Nucleare, Italy, awarded in 2015.

Best Astrophysics Poster Award, DPF 2015 Meeting.

Scholarship for Scientific Achievements funded by National Centre for Nuclear Research, Poland, awarded in 2014, 2015 and 2016.

Marie Skłodowska-Curie Actions, Research and Innovation Staff Exchange (H2020-MSCA-RISE-2014) funded by Horizon 2020 EU's programme, Co-Investigator.

Human Capital Programme Scholarship funded by European Social Fund in Poland, awarded in 2011 and 2012.

Rector Scholarship funded by University of Warsaw, Poland, awarded in 2009 and 2010.

Course/program development

2016 - now **CosmicWatch outreach program**, *A physics-motivated machine- and electronics-shop project for high school and university-level students*, specific contributions to the popularization, data acquisition system, website, mentoring high school, undergrad and grad students, postdocs, science teachers, professors and enthusiasts.
www.cosmicwatch.lns.mit.edu

2020 - 2021 **MIT Junior Lab**, *Providing materials and instructions for introducing CosmicWatch to undergraduate lab course during COVID*, Massachusetts Institute of Technology, Cambridge, MA

2019 - 2020 **Particle Physics Specialization Laboratory: Exercises in Research Groups**, *Developing educational materials and providing instructions*, Physics Department, University of Warsaw, Poland

2018 **ALPhA's Laboratory Immersions**, *Instructor during CosmicWatch Muon Detectors Advanced Laboratory (3 day program for professors)*, Wisconsin IceCube Particle Astrophysics Center, Madison, WI

2017 - 2019 **Detectors for Schools Programme**, *Building array of detectors, translating course materials and providing training*, Education and Training Division of National Center for Nuclear Research, Poland
www.ncbj.gov.pl/en/deis/detectors-for-schools

2017 **WIPAC-QuarkNet Internship**, *Mentor during summer program for high school students (6 weeks)*, Wisconsin IceCube Particle Astrophysics Center, Madison, WI

2010 **'Almukantarat' Astronomy Club Science Camp**, *Lecturer for Introduction to Astronomy (series of 15 lectures) and science program coordinator*, Załecze Wielkie, Poland

2009 **'Almukantarat' Astronomy Club Science Camp**, *Lecturer for Introduction to Astronomy (series of 15 lectures)*, Załecze Wielkie, Poland

Teaching and Outreach

2023 **IceCube MasterClass**, *Instructor during CosmicWatch workshop*, University of Delaware, Newark, DE

2019 **Artemis Project**, *Volunteer during workshop for 9th grade girls*, Boston University Learning Resource Network (LERNet), Boston, MA

2018 **Far Horizons**, *Outreach program support*, Adler Planetarium, Chicago, IL

2018 **CosmicWatch Workshop**, *Instructor during workshop for high school teachers*, Teacher Training Centre, Olsztyn, Poland

2018 **NearSpace Conference**, *Public lecture: CosmicWatch - A pocket-size particle detector you can build yourself*, Providing payload for a high altitude balloon flight, Toruń, Poland

2018 **CosmicWatch Workshop**, *Instructor during workshop for middle and high school teachers*, Copernicus Science Centre, Warsaw, Poland

2018 **Advanced Workshop on Technology for Sustainable Development: Low-Cost Tools to support Scientific Education**, *Instructor*, International Centre for Theoretical Physics (ICTP), Trieste, Italy

2017 **CosmicWatch Workshop**, *Instructor during workshop for Young Explorer's Club*, National Centre for Nuclear Research, Świerk, Poland

2017 **44th Congress of Polish Physical Society**, *Public lecture: Searches for Dark matter*, Wroclaw University of Science and Technology, Poland

2015 **Warsaw Science Festival**, *Instructor during workshops for high school students: See the invisible - Build a cloud chamber detector, Public lecture: Mysteries of the Universe: Dark Matter*, Physics Department, University of Warsaw, Poland

2014 **Warsaw Science Festival**, *Instructor during workshops for high school students: See the invisible - Build a cloud chamber*, Physics Department, University of Warsaw, Poland

2007 - 2014 **Tutoring in math and physics**, *(over 25 students, middle school, high school, undergraduate level)*, Poland

2007 - 2012 **'Almukantarat' Astronomy Club**, *Volunteer*, Education and popularization of Astronomy, Poland

Conferences (selected)

Jun. 2020 **XXIX International Conference on Neutrino Physics and Astrophysics (Neutrino2020)**, Fermilab, Batavia, IL

Jun. 2018 **XXVIII International Conference on Neutrino Physics and Astrophysics (Neutrino2018)**, *Search for neutrinos from dark matter annihilation in the Earth core with the Super-Kamiokande detector (elevator speech and poster)*, Heidelberg, Germany

Aug. 2017 **Meeting of the American Physical Society Division of Particles and Fields (DPF2017)**, *Searches for dark matter with the Super-Kamiokande detector (talk)*, *CosmicWatch: The Desktop Muon Detectors (poster)*, Fermi National Accelerator Laboratory, Batavia, IL

Jun. 2017 **The 26th International Workshop on Weak Interactions and Neutrinos (WIN2017)**, *Dark matter searches with the Super-Kamiokande detector (talk)*, University of California Irvine, CA

Aug. 2016 **38th International Conference on High Energy Physics (ICHEP2016)**, *Dark matter searches with the Super-Kamiokande detector (elevator talk and poster)*, Chicago, IL

Jul. 2016 **XXVII International Conference on Neutrino Physics and Astrophysics (Neutrino2016)**, *Dark matter searches with the Super-Kamiokande detector (poster)*, Imperial College London, UK

Aug. 2015 **Meeting of the Division of Particles and Fields of the American Physical Society (DPF2015)**, *Searching for Dark Matter Annihilation into Neutrinos with Super-Kamiokande (talk and poster)*, University of Michigan, Ann Arbor, MI

Mar. 2015 **XXIX Rencontres de Physique de la Vallee d'Aoste**, *Indirect searches for dark matter particles with the Super-Kamiokande detector (talk)*, Istituto Nazionale di Fisica Nucleare (INFN), Aosta, Italy

Seminars (selected)

Apr. 2019 **High Energy Experiment Seminar**, *Boston University*, *Indirect searches for dark matter with neutrinos*, Boston, MA

Jan. 2019 **High Energy Physics Seminar**, *University of Warsaw*, *CosmicWatch: a pocket-size particle detector you can build yourself*, Warsaw, Poland

Jan. 2018 **Nuclear Facilities Operations Department Seminar**, *National Centre for Nuclear Research*, *CosmicWatch project*, Świerk, Poland

Jul 2017 **X-meeting**, *Wisconsin IceCube Particle Astrophysics Center (WIPAC)*, *Dark matter searches with the Super-Kamiokande detector*, Madison, WI

Sep. 2015 **PhD Students Semminar**, *National Centre for Nuclear Research*, *Searching for Dark Matter Annihilation into Neutrinos with Super-Kamiokande*, Warsaw, Poland

Oct. 2013 **High Energy Physics Seminar**, *University of Warsaw*, *Dark matter searches - the latest results*, Warsaw, Poland

Publications (selected)

M. R. Anderson *et al.* (**SNO+ Collaboration**), *Developmnent, characterisation, and deployment of the SNO+ liquid scintillator*, JINST 16 (2021) 05, P05009.

K. Abe *et al.* (**Super-Kamiokande Collaboration**), *Indirect Search for Dark Matter from the Galactic Center and Halo with the Super-Kamiokande Detector*, Phys. Rev. D 102 (2020) 7, 072002.

M. Askins *et al.* (**Theia Collaboration**), *THEIA: an advanced optical neutrino detector*, Eur.Phys.J.C 80 (2020) 5, 416.

D. L. Danielson *et al.* (**AIT-WATCHMAN Collaboration**), *Directionally Accelerated Detection of an Unknown Second Reactor with Antineutrinos for Mid-Field Nonproliferation Monitoring*, arXiv:1909.05374 (2019).

K. Abe *et al.* (**Hyper-Kamiokande Collaboration**), *Hyper-Kamiokande Design Report*, arXiv:1805.04163 (2018).

C. Kachulis *et al.* (**Super-Kamiokande Collaboration**), *Search for Boosted Dark Matter Interacting With Electrons in Super-Kamiokande*, Phys. Rev. Lett. 120 (2018) no.22, 221301.

S. Axani, **K. Frankiewicz** and J. Conrad, *The CosmicWatch Desktop Muon Detector: a self-contained, pocket sized particle detector*, JINST 13 (2018) no.03, P03019.

K. Frankiewicz (for Super-K Collaboration), *Dark matter searches with the Super-Kamiokande detector*, J. Phys. Conf. Ser. 888 (2017) no.1, 012210.

K. Frankiewicz (for Super-K Collaboration), *Indirect searches for dark matter particles with the Super-Kamiokande detector*, Nuovo Cim. C38 (2016) no. 4, 125.

Languages

Polish	Native	
English	Fluent	*The Certificate of Language Proficiency, University of Warsaw, 2011*
French	Basic	

Computer skills

Software packages	Mathematica, ROOT, RAT, Matlab, Latex, Gnuplot, Microsoft Office/LibreOffice
Computer languages	C++, Python, Java, Fortran, Bash, HTML and CSS
Operating systems	Unix, Windows