# 

Oleksii Poleshchuk

### PhD researcher in Nuclear Physics

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[HOME](http://docs.google.com/index.html) [PROJECTS](http://docs.google.com/projects.html) [CONTACTS](#gjdgxs)

ABOUT

I am a physicist interested in developing particle and radiation detectors and working on challenging data analysis projects.

My PhD project was in building SpecMAT, the new generation active target - time projection chamber that will be installed at CERN (HIE-ISOLDE) for nuclear structure studies.

During research at KU Leuven, I have got an opportunity to work on several projects and be a part of the ACTAR collaboration that span the major nuclear research institutions of Europe, including GANIL (Caen, France), INFN-LNL (Legnaro, Italy) and the University of Santiago de Compostela (Spain). In this collaboration, I have participated in the development of auxiliary Double-sided Silicon Strip Detector (DSSSD) arrays for the ACTAR-Demonstrator and the ACTAR active targets.

I enjoy playing table tennis (2 years in a row held 2nd place in the amateur group of the Department of Physics's annual competition) and do indoor climbing in my spare time. Photography is my other passion which fuses things that fascinates me the most, art and advanced detection technology.

KEY RESEARCH SUBJECTS

Active targets, Time projection chambers, Scintillation detectors, SiPMs, DSSSD, spectrometry, GEANT4 and COMSOL physics simulations, CAD design, digital data acquisition electronics, big data management and analysis

EDUCATION

PhD researcher

*Nuclear Physics*

Transfer reaction studies in an active target

**KU Leuven, Belgium**

Expected SUMMER 2021

IN PROGRESS

Master of Science

*Nuclear and Particle Physics*

Thesis: Characterization of a New Plastic Scintillation Material and Comparison with Liquid BC501A Scintillator (Neutron-Gamma pulse shape discrimination)

**University of Jyväskylä, Finland**

28 October 2015

Specialist's Degree, Honors Diploma

*Medical Physics*

Thesis: Computation and comparative analysis of spectra of muscle tissue movements under correlated and not correlated isometric muscles contractions

**V.N. Karazin Kharkiv National University, Ukraine**

05 June 2012

Bachelor of Science

*Applied Physics*

Thesis: Studying the spectra of local muscle displacements under correlated and not correlated isometric contractions

**V.N. Karazin Kharkiv National University, Ukraine**

06 July 2011

PROFESSIONAL EXPERIENCE

Cyclotron operator

University of Jyväskylä

SEPTEMBER 2014 - DECEMBER 2015

Jyväskylä, Finland

Researcher traineeship

University of Jyväskylä

Research Topic: "Calibration of a low-background high-purity germanium detector"

JUNE 2015 - SEPTEMBER 2015

Jyväskylä, Finland

Researcher traineeship

University of Jyväskylä

Research Topic: "Maintenance of the JYFLTRAP Penning-trap set-up for precision mass spectroscopy"

JUNE 2014 - SEPTEMBER 2014

Jyväskylä, Finland

ACADEMIC EXPERIENCE

Teaching duties during the PhD research

KU Leuven

* Master students - Laboratory work supervision within the course of Research Methods in Nuclear Physics (2 semesters)
* Bachelor students(3rd year) - Thesis supervision (1 semester)
* Bachelor students(2nd year) - Laboratory work supervision (3 semesters)
* Development of a laboratory set-up for Bachelor students using novel technique in gamma-ray spectroscopy. This set-up was built to include three research topics into one set-up:
  + Study of 60Co gamma-ray angular correlation
  + Basics of Gamma cameras
  + Principles of Positron Emission Tomography

JANUARY 2016 - PRESENT

Leuven, Belgium

Lecturer Assistant

Kharkiv National Medical University

* Practical sessions within the course of Medical Informatics
* Duties of publication of studying literature and materials developed at the Department of Physics

SEPTEMBER 2012 - JUNE 2013

Kharkiv, Ukraine

Physics and Astronomy Lecturer

Kharkiv Electromechanical Technical College, Ukraine

* Lectures, practical classes and laboratory works in Physics
* Lectures in Astronomy

JANUARY 2012 - JUNE 2012

Kharkiv, Ukraine

HONORS and AWARDS

ISOLDE Workshop and Users meeting

Best young speaker award, 1st place

NOV 2020

CERN, Genewa, Switzerland (online)

Workshop on Applications Of Novel Scintilators For Research And Industry (ANSRI)

Best research presentation, 3rd prize

MAY 2016

University College Dublin, Ireland

Specialist's Degree, V.N. Karazin Kharkiv National University

Honors Diploma

June 2012

Kharkiv, Ukraine

20th International Young Physicists' Tournament

Participant Diploma

JULY 2007

Seoul, Republic of Korea

15th National Young Physicists' Tournament

1st place

FEBRUARY 2007

Odessa, Ukraine

14th National Young Physicists' Tournament

2nd place

MARCH 2006

Kherson, Ukraine

PUBLICATIONS

Performance tests of a LaBr3:Ce detector coupled to a SiPM array and the GET electronics for gamma-ray spectroscopy in a strong magnetic field

**Poleshchuk, O;** Swartz, JA; Arokiaraj, A; Ceruti S; De Witte, H; Grinyer, GF; Laffoley, AT; Marchi, T; Raabe, R; Renaud, M; Yang, J

Nuclear Instruments And Methods in Physics Research A

2021; Vol. 987; 164863

<https://doi.org/10.1016/j.nima.2020.164863>

A porous hexagonal boron nitride powder compact for the production and release of radioactive 11C

Stegemann, S; Ballof, J; Cocolios, TE; Correia, JG; Dockx, K; **Poleshchuk, O;** Ramos, JP; Schell, J.; Stora, T; Vleugels, J

Journal of the European Ceramic Society

2020; 0955-2219

<https://doi.org/10.1016/j.jeurceramsoc.2020.12.029>

First Exploration of Neutron Shell Structure below Lead and beyond N=126

Tang, TL; Kay, BP; Hoffman, CR; Schiffer, JP; Sharp, DK; Gaffney, LP; Freeman, SJ; Mumpower, MR; Arokia Raj, A; Baader, EF; Butler, PA; Catford, WN; de Angelis, G; Flavigny, F; Gott, MD; Gregor, ET; Konki, J; Labiche, M; Lazarus, IH; MacGregor, PT; Martel, I; Page, RD; Podolyák, Z; **Poleshchuk, O;** Raabe, R; Recchia, F; Smith, JF; Szwec, SV; Yang, J;

Physical Review Letters

2020; Vol. 124; iss. 6; 062502

<https://doi.org/10.1103/PhysRevLett.124.062502>

Commissioning of the ACtive TARget and Time Projection Chamber (ACTAR TPC)

Mauss, B; Morfouace, P; Roger, T; Pancin, J; Grinyer, GF; Giovinazzo, J; Alcindor, V; Álvarez-Pol, H; Arokia Raj, A; Babo, M; Bastin, B; Borcea, C; Caamaño, M; Ceruti, S; Fernández-Domínguez, B; Foulon-Moret, E; Gangnant, P; Giraud, S; Laffoley, A; Mantovani, G; Marchi, T; Monteagudo, B; Pibernat, J; **Poleshchuk, O;** Raabe, R; Refsgaard, J; Revel, A; Saillant, F; Stanoiu, M; Wittwer, G; Yang, J;

Nuclear Instruments And Methods in Physics Research A

2019; Vol. 940; pp. 498 - 504

<https://doi.org/10.1016/j.nima.2019.06.067>

Study of the Isospin Symmetry in 60Zn

Gosta, G; Ceruti, S; Mentana, A; Ciemała, M; Camera, F; Bracco, A; Benzoni, G; Blasi, N; Bocchi, G; Brambilla, S; Crespi, FCL; Giaz, A; Leoni, S; Million, B; Wieland, O; Kmiecik, M; Maj, A; Wasilewska, B; Ziębliński, M; Filipescu, D; Ghita, D; Zamfir, V; Valiente-Dobon, JJ; de Angelis, G; Galtarossa, F; Goasduff, A; Jaworski, G; Napoli, DR; Testov, D; Siciliano, M; Marchi, T; Mengoni, D; Bazzacco, D; Boso, A; John, PR; Recchia, F; Raabe, R; **Poleshchuk, O;** Yang, J

Acta Physica Polonica B

2019; Vol. 50; iss. 3; pp. 481 - 486

<https://doi.org/10.5506/APhysPolB.50.481>

Demonstrator Detection System for the Active Target and Time Projection Chamber (ACTAR TPC) project

Roger, T; Pancin, J; Grinyer, GF; Mauss, B; Laffoley, AT; Rosier, P; Alvarez-Pol, H; Babo, Mathieu; Blank, B; Caamaño, M; Ceruti, Simone; Daemen, Jannes; Damoy, S; Duclos, B; Fernández-Domínguez, B; Flavigny, F; Giovinazzo, J; Goigoux, T; Henares, JL; Konczykowski, P; Marchi, Tommaso; Lebertre, G; Lecesne, N; Legeard, L; Maugeais, C; Minier, G; Osmond, B; Pedroza, JL; Pibernat, J; **Poleshchuk, O;** Pollacco, EC; Raabe, Riccardo; Raine, B; Renzi, Francesca; Saillant, F; Sénécal, P; Sizun, P; Suzuki, D; Swartz, Cobus; Wouters, C; Wittwer, G; Yang, Jiecheng

Nuclear Instruments And Methods in Physics Research A

2018; Vol. 895; pp. 126 - 134

<https://doi.org/10.1016/j.nima.2018.04.003>

GET: A generic electronics system for TPCs and nuclear physics instrumentation

Pollacco, EC; Grinyer, GF; Abu-Nimeh, F; Ahn, T; Anvar, S; Arokia Raj, Alex; Ayyad, Y; Baba, H; Babo, Mathieu; Baron, P; Bazin, D; Beceiro-Novo, S; Belkhiria, C; Blaizot, M; Blank, B; Bradt, J; Cardella, G; Carpenter, L; Ceruti, Simone; De Filippo, E; Delagnes, E; De Luca, S; De Witte, Hilde; Druillole, F; Duclos, B; Favela, F; Fritsch, A; Giovinazzo, J; Gueye, C; Isobe, T; Hellmuth, P; Huss, C; Lachacinski, B; Laffoley, AT; Lebertre, G; Legeard, L; Lynch, WG; Marchi, Tommaso; Martina, L; Maugeais, C; Mittig, W; Nalpas, L; Pagano, EV; Pancin, J; **Poleshchuk, O;** Pedroza, JL; Pibernat, J; Primault, S; Raabe, Riccardo; Raine, B; Rebii, A; Renaud, Maxime; Roger, T; Roussel-Chomaz, P; Russotto, P; Saccà, G; Saillant, F; Sizun, P; Suzuki, D; Swartz, Cobus; Tizon, A; Usher, N; Wittwer, G; Yang, Jiecheng

Nuclear Instruments And Methods in Physics Research A

2018; Vol. 887; pp. 81 - 93

<https://doi.org/10.1016/j.nima.2018.01.020>

Q(EC) value of the superallowed beta emitter 42Sc

Eronen, T; Hardy, JC; Canete, L; Jokinen, A; Hakala, J; Kankainen, A; Kolhinen, VS; Koponen, J; Moore, ID; Murray, IM; Penttila, H; Pohjalainen, I; **Poleshchuk, O;** Reinikainen, J; Rinta-Antila, S; Soukouti, N; Voss, A; Aysto, J

Physical Review C

2017; Vol. 95; iss. 2

<https://doi.org/10.1103/PhysRevC.95.025501>

PROPOSALS and LETTERS OF INTENT

Single-particle proton states in 69Cu

**O. Poleshchuk**, R. Raabe, M. Babo, P.A. Butler, S. Ceruti, H. De Witte, B. Fernandez-Dominguez, F. Flavigny, S. Franchoo, S.J. Freeman, L. Gaffney, G.F. Grinyer, M. Labiche, A.T. Laffoley, T. Marchi, R.D. Page, A.A. Raj, M. Renaud, F. Renzi, T. Roger, D.K. Sharp, J.A. Swartz, J. Yang

ISOLDE and Neutron Time-of-Flight Experiments Committee (INTC)

CERN-INTC-2017-059 ; INTC-I-191

<http://cds.cern.ch/record/002266818>

Shell structure of odd neutron-rich 71−75Cu isotopes via one proton transfer reactions.

**O. Poleshchuk**, R. Raabe, H. Alvarez-Pol, M. Babo, B.Bastin, B.Blank, M. Caamaño, S. Ceruti, F. de Oliveira Santos, N. de Sereville, B. Duclos, H. De Witte, B. Fernandez-Dominguez, F. Flavigny, S. Franchoo, L. Gaffney J. Giovinazzo, T. Goigoux, G.F. Grinyer, F. Hammache, A. Illana, A.T. Laffoley, T. Marchi, B. Mauss, J. Pancin, J.L. Pedroza, J. Pibernat, E.C. Pollacco, F. Renzi, T. Roger, F. Saillant, P. Sizun, D.Suzuki, G.Wittwer, J. Yang

ISOLDE and Neutron Time-of-Flight Experiments Committee (INTC)

CERN-INTC-2017-012 ; INTC-P-495

<http://cds.cern.ch/record/2241254?ln=en>

PRESENTATIONS at CONFERENCES and WORKSHOPS

ISOLDE Workshop and Users meeting

*Talk, Invited speaker*

**Best young speaker award, 1st place**

"The SpecMAT active target"

NOVEMBER 2020

CERN, Geneva, Switzerland (online)

The 3rd ISOLDE Solenoidal Spectrometer Workshop

*Talk*

"Status of SpecMAT: first recorded events and characterisation of the detector"

JULY 2020

CERN, Geneva, Switzerland (online)

ISOLDE-EPIC workshop

*Poster*

"The SpecMAT active target"

DECEMBER 2019

CERN, Geneva, Switzerland

IKS-QSP scientific meeting

*Seminar*

"Development and construction of the SpecMAT active target"

OCTOBER 2019

Leuven, Belgium

The 2nd ISOLDE Solenoidal Spectrometer Workshop

*Talk*

"Development and construction of SpecMAT, the active target for transfer reactions in a strong homogeneous magnetic field"

AUGUST 2019

Liverpool, United Kingdom

International Nuclear Physics Conference 2019

*Poster*

"SpecMAT, the innovative active target for transfer reaction studies and gamma-ray spectroscopy in a high magnetic field"

JULY 2019

Glasgow, United Kingdom

EUROSCHOOL on exotic beams

*Poster*

"The SpecMAT active target"

AUGUST 2018

Leuven, Belgium

European Radioactive Ion Beams (EURORIB) conference

*Talk*

"The SpecMAT active target"

MAY 2018

Giens, France

Nordic Meeting on Nuclear Physics

*Talk*

"The SpecMAT active target"

MAY 2018

Longyearbyen, Svalbard

Seminar at the Institute for Nuclear and Radiation Physics

*Seminar talk*

"Developing SpecMAT"

APRIL 2018

Leuven, Belgium

University of Tokyo - KU Leuven workshop on shell-model calculations

*Talk*

"Studying transfer reactions with SpecMAT and Miniball + T-REX setups at HIE-ISOLDE"

MARCH 2018

Tokyo, Japan

Workshop on Gas-filled Detectors and Systems (GDS)

*Talk*

"Development of SpecMAT"

JANUARY 2018

Santiago De Compostela, Spain

Seminar at the Institute for Nuclear and Radiation Physics

*Seminar talk*

"SpecMAT detector for transfer reactions studies"

APRIL 2017

Leuven, Belgium

CERN, ISOLDE and n\_TOF Experiments Committee (INTC)

*Experiment proposal defense*

"Shell structure of odd neutron-rich 71-75Cu isotopes via one proton transfer reactions"

FEBRUARY 2017

Geneva, Switzerland

Workshop on Gas-filled Detectors and Systems (GDS)

*Talk*

"Scintillation array development for the SpecMAT detector"

JANUARY 2017

Legnaro, Italy

Seminar at the Physics department of the University of York

*Seminar talk*

"Scintillation array development for the SpecMAT detector"

DECEMBER 2016

York, United Kingdom

University of Tokyo - KU Leuven workshop on shell-model calculations

*Talk*

"Proton-hole states in 71-75Cu via (d,3He) transfer reactions on Zn isotopes."

NOVEMBER 2016

Tokyo, Japan

EurisolDF

*Poster*

"Scintillation array development for the SpecMAT detector"

OCTOBER 2016

Leuven, Belgium

EUROSCHOOL on exotic beams

*Poster*

"LaBr3:Ce and CeBr3 detector performances in high magnetic fields for the SpecMAT detector"

AUGUST 2016

Mainz, Germany

Workshop on Applications Of Novel Scintilators For Research And Industry (ANSRI)

*Poster*

**Best research presentation, 3rd prize**

"LaBr3:Ce and CeBr3 detector performances in high magnetic fields for the SpecMAT detector"

MAY 2016

Dublin, Ireland

BriX Workshop

*Talk*

"LaBr3:Ce and CeBr3 detector performances in high magnetic fields for the SpecMAT detector"

MAY 2016

Mol, Belgium

LANGUAGES

English

Fluent

Ukrainian

Native

Russian

Native

SKILLS

Physics simulations

Finite element method (COMSOL)

Electric field

Stress simulation

Monte Carlo method (GEANT4)

Interaction of radiation with matter

Particle trajectories

Simulation of ion optics (SIMION)

Mechanical design in CAD software

Autodesk INVENTOR

Autodesk FUSION 360

Autodesk Meshmixer

Data analysis and visualisation

ROOT

Origin Pro

Python scientific packages (Matplotlib, NumPy)

Programming

C++

Python

GitHub

CONTACT

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Address

KU Leuven

Department of Physics and Astronomy

Instituut voor Kern- en Stralingsfysica

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3001 LEUVEN

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