

# Curriculum Vitae

Dmytro V. Kasperovych

## Current position

Sci. Researcher

Lepton Physics Department

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## Personal data

Born in Khmilnyk, Vinnytsia region, Ukraine, February 8, 1991.

Marital status: Single.

## Education

2012: Bachelor Diploma in Physics; Taras Shevchenko National University of Kyiv, Ukraine. Title: “Features of decay of the first excited state of  $^8\text{Be}$  nucleus in  $^{11}\text{B}(p,\alpha)\alpha$  reaction”.

2015: Master Diploma in Nuclear Physics and High Energy Physics; Taras Shevchenko National University of Kyiv, Ukraine. Title: “Formation and decay of intermediate resonances at the interaction of protons with  $^{11}\text{B}$  nuclei”.

2020: PhD degree in Physics; Institute for Nuclear Research of NAS of Ukraine. Title: “Double beta decay of  $^{116}\text{Cd}$  and  $^{150}\text{Nd}$  nuclei”.

## Language skills

Ukrainian (native), Russian (native), English (intermediate).

## Scientific interests

Rare nuclear decays, double beta decay, radiopurity of materials, gamma-spectrometry, low-counting experiments.

## Professional Employment

2012-2015:	Engineer, Nuclear Reactions Department, Institute for Nuclear Research, Kyiv, Ukraine.
Mar - Oct 2018:	Engineer, Lepton Physics Department, Institute for Nuclear Research, Kyiv, Ukraine.
Nov 2018:	Leading Engineer, Lepton Physics Department, Institute for Nuclear Research, Kyiv, Ukraine.
Dec 2018 – Feb 2021:	Junior Researcher, Lepton Physics Department, Institute for Nuclear Research, Kyiv, Ukraine.
Mar 2021 – till now:	Sci. Researcher, Lepton Physics Department, Institute for Nuclear Research, Kyiv, Ukraine.

## Main achievements

- Research of double beta decay of  $^{116}\text{Cd}$  using enriched  $^{116}\text{CdWO}_4$  crystal scintillators. The most accurate value for two-neutrino double beta decay of  $^{116}\text{Cd}$  to the ground state of daughter nucleus has been obtained. The most stringent lower limits on half-life of  $^{116}\text{Cd}$  relatively to the two neutrino and neutrinoless double beta decay to the excited states of  $^{116}\text{Sn}$  have been set.
- Investigation of double beta decay of  $^{150}\text{Nd}$  using low background HP Ge detectors. Half-life value of  $^{150}\text{Nd}$  relatively to the  $2\nu 2\beta$  decay to the first  $0^+$  excited state of  $^{150}\text{Sm}$  has been obtained.
- Development and test of low background scintillation setup with high-volume cadmium tungstate crystal for R&D of radiopure scintillators and materials.

## International collaboration

- Collaboration with the DAMA group, search for  $2\beta$  decay, study of rare  $\beta$  and  $\alpha$  decay (2016 – continuing, Gran Sasso National Laboratory, INFN, Italy).

## Participation in conferences, workshops, schools, trainings

- 28<sup>th</sup> Annual Conference of Institute for Nuclear Research, 27.09 – 01.10.2021, Kyiv, Ukraine.
- 27<sup>th</sup> Annual Conference of Institute for Nuclear Research, 21 – 25.09.2020, Kyiv, Ukraine.
- The VIII Pontecorvo Neutrino Physics School, 01 – 10.09.2019, Sinaia, Romania.
- “Matrix Elements for the Double beta decay Experiments” (MEDEX’19), 27 – 31.05.2019, Prague, Czech Republic.
- 26<sup>th</sup> Annual Conference of Institute for Nuclear Research, 08 – 12.04.2019, Kyiv, Ukraine.
- Joint ICTP-IAEA Workshop on Nuclear Structure and Decay Data: Theory, Experiment and Evaluation, 15–26.10.2018, Trieste, Italy.
- International Workshop for Young Scientists “Functional Materials for Technical and Biomedical Applications”, 5–8.09.2018, Kharkiv, Ukraine.
- 25<sup>th</sup> Annual Conference of Institute for Nuclear Research, 16–20.04.2018, Kyiv, Ukraine.

- 4<sup>th</sup> International Conference “High-Purity Materials: Production, Application, Properties”, 12–15.09.2017, Kharkiv, Ukraine.
- International Workshop for Young Scientists “Scintillation Processes and Materials for Detection of Ionizing Radiation”, 10–13.09.2017, Kharkiv, Ukraine.
- International Conference on Oxide Materials for Electronic Engineering, 29.05–02.06.2017, Lviv, Ukraine.
- 24<sup>th</sup> Annual Conference of Institute for Nuclear Research, Kyiv, Ukraine. April 10-13, 2017.
- 20<sup>th</sup> Annual Conference of Institute for Nuclear Research, 28.01 – 1.02.2013, Kyiv, Ukraine.

## LIST OF PUBLICATIONS

### Papers in peer-reviewed journals

1. P. Belli, R. Bernabei, R.S. Boiko, F. Cappella, V. Caracciolo, R. Cerulli, F.A. Danevich, A. Incicchitti, D.V. Kasperovych, V.V. Kobychyev, O.G. Polischuk, N.V. Sokur, **The half-life of  $^{212}\text{Po}$** , *Eur. Phys. J. A* 57 (2021) 215.  
DOI: 10.1140/epja/s10050-021-00510-y
2. P. Belli, R. Bernabei, V.B. Brudanin, F. Cappella, V. Caracciolo, R. Cerulli, F.A. Danevich, A. Incicchitti, D.V. Kasperovych, V.R. Klavdiienko, V.V. Kobychyev, V. Merlo, O.G. Polischuk, V.I. Tretyak and M.M. Zarytskyy, **Search for Double Beta Decay of  $^{106}\text{Cd}$  with an Enriched  $^{106}\text{CdWO}_4$  Crystal Scintillator in Coincidence with  $\text{CdWO}_4$  Scintillation Counters**, *Universe* 6 (2020) 182.  
DOI: 10.3390/universe6100182
3. F.A. Danevich, M. Hult, D.V. Kasperovych, V.R. Klavdiienko, G. Lutter, G. Marissens, O.G. Polischuk, and V.I. Tretyak, **Decay scheme of  $^{50}\text{V}$** , *Phys. Rev. C* 102 (2020) 024319.  
DOI: 10.1103/PhysRevC.102.024319
4. P. Belli, R. Bernabei, F. Cappella, V. Caracciolo, R. Cerulli, F.A. Danevich, A. Incicchitti, D.V. Kasperovych, V.V. Kobychyev, G.P. Kovtun, N.G. Kovtun, M. Laubenstein, D.V. Poda, O.G. Polischuk, A.P. Shcherban, S. Tossalina, and V.I. Tretyak, **Search for  $\alpha$  decay of naturally occurring osmium nuclides accompanied by  $\gamma$  quanta**, *Phys. Rev. C* 102 (2020) 024605.  
DOI: 10.1103/PhysRevC.102.024605
5. F.A. Danevich, M. Hult, D.V. Kasperovych, G.P. Kovtun, K.V. Kovtun, G. Lutter, G. Marissens, O.G. Polischuk, S.P. Stetsenko, V.I. Tretyak, **First search for  $2\varepsilon$  and  $\varepsilon\beta^+$  decay of  $^{174}\text{Hf}$** , *Nucl. Phys. A* 996 (2020) 121703.  
DOI: 10.1016/j.nuclphysa.2020.121703
6. D.L. Helis, I.C. Bandac, A.S. Barabash, J. Billard, M. Chapellier, M. de Combarieu, F.A. Danevich, L. Dumoulin, J. Gascon, A. Giuliani, D.V. Kasperovych, V.V. Kobychyev, P. de Marcillac, S. Marnieros, C. Nones, V. Novati, E. Olivieri, D.V. Poda, O.G. Polischuk, Th. Redon, V.I. Tretyak, A.S. Zolotarova, **Neutrinoless Double-Beta Decay Searches with Enriched  $^{116}\text{CdWO}_4$  Scintillating Bolometers**, *J. Low Temp. Phys.* 199 (2020) 467.  
DOI: 10.1007/s10909-019-02315-2
7. P. Belli, R. Bernabei, F. Cappella, V. Caracciolo, R. Cerulli, N. Cherubini, F.A. Danevich, A. Incicchitti, D.V. Kasperovych, V. Merlo, E. Piccinelli, O.G. Polischuk, V.I. Tretyak,

**Measurements of ZnWO<sub>4</sub> anisotropic response to nuclear recoils for the ADAMO project**, *Eur. Phys. J. A* 56 (2020) 83.

DOI: 10.1140/epja/s10050-020-00094-z

8. F.A. Danevich, M. Hult, D.V. Kasperovych, G.P. Kovtun, K.V. Kovtun, G. Lutter, G. Marissens, O.G. Polischuk, S.P. Stetsenko, V.I. Tretyak, **First search for  $\alpha$  decays of naturally occurring Hf nuclides with emission of  $\gamma$  quanta**, *Eur. Phys. J. A* 56 (2020) 5.  
DOI: 10.1140/epja/s10050-019-00005-x.
9. B. Singh, M.S. Basunia, M. Martin, E.A. McCutchan, I. Bala, R. Caballero-Folch, R. Canavan, R. Chakrabarti, A. Chekhovska, M.M. Grinder, S. Kaim, D. Kanjilal, D. Kasperovych, M.J. Kobra, H. Koura, S. Nandi, A. Olacel, A. Singh, B.P.E. Tee, **Nuclear Data Sheets for A=218**, *Nucl. Data Sheets* 160 (2019) 405,  
DOI: 10.1016/j.nds.2019.100524
10. P. Belli, R. Bernabei, F. Cappella, V. Caracciolo, R. Cerulli, N. Cherubini, F.A. Danevich, A. Incicchitti, D.V. Kasperovych, V. Merlo, E. Piccinelli, O.G. Polischuk and V.I. Tretyak, **New development of radiopure ZnWO<sub>4</sub> crystal scintillators**, *Nucl. Instr. Meth. A* 935 (2019) 89.  
DOI: 10.1088/1748-0221/15/05/C05055.
11. A. S. Barabash, P. Belli, R. Bernabei, F. Cappella, V. Caracciolo, R. Cerulli, D. M. Chernyak, F. A. Danevich, S. d'Angelo, A. Incicchitti, D. V. Kasperovych, V. V. Kobychyev, S. I. Konovalov, M. Laubenstein, D. V. Poda, O. G. Polischuk, V. N. Shlegel, V. I. Tretyak, V. I. Umatov, and Ya. V. Vasiliev, **Final results of the Aurora experiment to study  $2\beta$  decay of <sup>116</sup>Cd with enriched <sup>116</sup>CdWO<sub>4</sub> crystal scintillators**, *Phys. Rev. D* 98 (2018) 092007.  
DOI: 10.1103/PhysRevD.98.092007.
12. P. Belli, R. Bernabei, R.S. Boiko, F.A. Danevich, A. Di Marco, A. Incicchitti, D.V. Kasperovych, F. Cappella, V. Caracciolo, V.V. Kobychyev, O.G. Polischuk, N.V. Sokur, V.I. Tretyak, R. Cerulli, **Half-life measurements of <sup>212</sup>Po with thorium-loaded liquid scintillator**, *Nucl. Phys. At. Energy* 19 (2018) 220.  
DOI: 10.15407/jnpae2018.03.220.
13. A.S. Barabash, P. Belli, R. Bernabei, R.S. Boiko, F. Cappella, V. Caracciolo, R. Cerulli, F.A. Danevich, A. Di Marco, A. Incicchitti, D.V. Kasperovych, R.V. Kobychyev, V.V. Kobychyev, S.I. Konovalov, M. Laubenstein, D.V. Poda, O.G. Polischuk, V.I. Tretyak, V.I. Umatov, **Double beta decay of <sup>150</sup>Nd to the first excited 0<sup>+</sup> level of <sup>150</sup>Sm: preliminary results**, *Nucl. Phys. At. Energy* 19 (2018) 95.  
DOI: 10.15407/jnpae2018.02.095.
14. D.V. Kasperovych, F.A. Danevich, V.V. Kobychyev, B.N. Kropivnyansky, N.V. Sokur, A.I. Tymoshenko, **Low background scintillation setup to investigate radiopurity of materials**, *Problem. At. Sci. Tech.* 208 (2018) 24.
15. Yu.N. Pavlenko, V.L. Shablov, V.O. Kyva, O.K. Gorpinich, N.L. Doroshko, A.V. Stepanyuk, O.I. Rundel, L.L. Dulger, D.V. Kasperovych, **Deuteron and triton decays of <sup>5</sup>He resonances in the reaction <sup>7</sup>Li(d, $\alpha$ )<sup>5</sup>He\***. *Nucl. Phys. At. Energy* 13 (2012) 350.

## Conference proceedings

1. O.G. Polischuk, A.S. Barabash, P. Belli, R. Bernabei, R.S. Boiko, F. Cappella, V. Caracciolo, R. Cerulli, F.A. Danevich, A. Di Marco, A. Incicchitti, D.V. Kasperovych, V.V. Kobychyev, S.I. Konovalov, M. Laubenstein, D.V. Poda, V.I. Tretyak, V.I. Umatov, **Double beta decay of  $^{150}\text{Nd}$  to the first  $0^+$  excited level of  $^{150}\text{Sm}$** , *Phys. Scripta* 96 (2021) 085302.  
DOI: 10.1088/1402-4896/ac00a5
2. A.S. Barabash, P. Belli, R. Bernabei, F. Cappella, V. Caracciolo, R. Cerulli, F.A. Danevich, A. Di Marco, A. Incicchitti, D.V. Kasperovych, V.V. Kobychyev, M. Laubenstein, V. Merlo, F. Montecchia, O.G. Polischuk, D.V. Poda, V.I. Tretyak and V.N. Shlegel, **Low background scintillators to investigate rare processes**, *JINST* 15 (2020) C07037.  
DOI: 10.1088/1748-0221/15/07/C07037.
3. P. Belli, R. Bernabei, F. Cappella, V. Caracciolo, R. Cerulli, N. Cherubini, F.A. Danevich, A. Incicchitti, D.V. Kasperovych, V. Merlo, E. Piccinelli, O.G. Polischuk and V.I. Tretyak, **Developments and improvements of radiopure  $\text{ZnWO}_4$  anisotropic scintillators**, *JINST* 15 (2020) C05055.  
DOI: 10.1088/1748-0221/15/05/C05055
4. D.V. Kasperovych, A.S. Barabash, P. Belli, R. Bernabei, R.S. Boiko, F. Cappella, V. Caracciolo, R. Cerulli, F.A. Danevich, A. Di Marco, A. Incicchitti, V.V. Kobychyev, S.I. Konovalov, M. Laubenstein, D.V. Poda, O.G. Polischuk, V.I. Tretyak, and V.I. Umatov, **Study of Double- $\beta$  Decay of  $^{150}\text{Nd}$  to the First  $0^+$  Excited Level of  $^{150}\text{Sm}$** , *AIP Conf. Proc.* 2165 (2019) 020014.  
DOI: 10.1063/1.5130975
5. O.G. Polischuk, P. Belli, R. Bernabei, V.B. Brudanin, F. Cappella, V. Caracciolo, R. Cerulli, F.A. Danevich, A. Incicchitti, D.V. Kasperovych, V.V. Kobychyev, V.I. Tretyak, and M.M. Zarytskyy, **New limit on two neutrino electron capture with positron emission in  $^{106}\text{Cd}$** , *AIP Conf. Proc.* 2165 (2019) 020020.  
DOI: 10.1063/1.5130981
6. V.I. Tretyak, A.S. Barabash, P. Belli, R. Bernabei, F. Cappella, V. Caracciolo, R. Cerulli, D.M. Chernyak, F.A. Danevich, S. d'Angelo, A. Incicchitti, D.V. Kasperovych, V.V. Kobychyev, S.I. Konovalov, M. Laubenstein, D.V. Poda, O.G. Polischuk, V.N. Shlegel, V.I. Umatov, and Ya.V. Vasiliev, **Aurora experiment: Final results of studies of  $^{116}\text{Cd}$   $2\beta$  decay with enriched  $^{116}\text{CdWO}_4$  crystal scintillators**, *AIP Conf. Proc.* 2165 (2019) 020029.  
DOI: 10.1063/1.5130990.
7. A. Di Marco, A.S. Barabash, P. Belli, R. Bernabei, R.S. Boiko, V.B. Brudanin, F. Cappella, V. Caracciolo, R. Cerulli, D.M. Chernyak, F.A. Danevich, A. Incicchitti, D.V. Kasperovych, V.V. Kobychyev, S.I. Konovalov, M. Laubenstein, V. Merlo, F. Montecchia, O.G. Polischuk, D.V. Poda, V.N. Shlegel, V.I. Tretyak, V.I. Umatov, Yan V. Vasiliev and M.M. Zarytskyy, **Recent Developments and Results on Double Beta Decays with Crystal Scintillators and HPGe Spectrometry**, *Universe* 4 (2018) 147.  
DOI: 10.3390/universe4120147.
8. A.S. Barabash, P. Belli, R. Bernabei, R.S. Boiko, V.B. Brudanin, F. Cappella, V. Caracciolo, R. Cerulli, D.M. Chernyak, C.J. Dai, F.A. Danevich, A. d'Angelo, A. Di Marco, H.L. He, A. Incicchitti, D.V. Kasperovych, V.V. Kobychyev, S.I. Konovalov, H.H. Kuang, X.H. Ma,

- V. Merlo, F. Montecchia, D.V. Poda, O.G. Polischuk, X.D. Sheng, V.N. Shlegel, V.I. Tretyak, V.I. Umatov, R.G. Wang, Z.P. Ye and M.M. Zarytskyy, **Search for rare processes with DAMA experimental set-ups**, *EPJ Web of Conferences* 182 (2018) 02026. DOI: 10.1051/epjconf/201818202026.
9. D.V. Kasperovych, F.A. Danevich, V. Kobychhev, B.N. Kropivnyansky, A. Tymoshenko, **Low Background CdWO<sub>4</sub> Scintillation Detector**. *Acta Phys. Pol. A* 133 (2018) 923. DOI: 10.12693/APHYSPOLA.131.923.
10. O.G. Polischuk, A.S. Barabash, P. Belli, R. Bernabei, F. Cappella, V. Caracciolo, R. Cerulli, D.M. Chernyak, F.A. Danevich, S. d'Angelo, A. Incicchitti, D.V. Kasperovych, V.V. Kobychhev, S.I. Konovalov, M. Laubenstein, V.M. Mokina, D.V. Poda, V.N. Shlegel, V.I. Tretyak, V.I. Umatov, and Ya.V. Vasiliev, **Investigation of 2 $\beta$  Decay of <sup>116</sup>Cd with the Help of Enriched <sup>116</sup>CdWO<sub>4</sub> Crystal Scintillators**. *AIP Conf. Proc.* 1894 (2017) 020018. DOI: 10.1063/1.5007643.
11. P. Belli, R. Bernabei, V.B. Brudanin, F. Cappella, V. Caracciolo, R. Cerulli, F.A. Danevich, A. Incicchitti, D.V. Kasperovych, V.V. Kobychhev, V.M. Mokina, O.G. Polischuk, V.I. Tretyak, and M.M. Zarytskyy, **Search for Double Beta Decay in <sup>106</sup>Cd in the DAMA/CRYS setup**. *AIP Conf. Proc.* 1894 (2017) 020005. DOI: 10.1063/1.5007630.
12. Yu.N. Pavlenko, V.L. Shablov, V.O. Kyva, O.K. Gorpinich, N.L. Doroshko, A.V. Stepanyuk, O.I. Rundel, L.L. Dulger, D.V. Kasperovych, **Deuteron and triton decay of <sup>5</sup>He resonances in the reaction <sup>7</sup>Li(d, $\alpha$ )<sup>5</sup>He**, Proceedings of The 4-th International Conference "Current Problems in Nuclear Physics and Atomic Energy" (NPAE-Kyiv2012), Kyiv, 2013, p. 202.

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