ANDREJ BABIČ

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PUBLICATIONS & GRANTS

[1] A. Babič, S. G. Kovalenko, M. I. Krivoruchenko, and F. Šimkovic, "Quark Condensate Seesaw Mechanism for Neutrino Mass," *Phys. Rev. D* **103**, 015007 (2021)

[2] A. Babič, S. G. Kovalenko, M. I. Krivoruchenko, and F. Šimkovic, "On the Generation of Majorana Neutrino Mass via Quark Condensate," *AIP Conf. Proc.* **2165**, 020001 (2019)

[3] A. Babič, S. G. Kovalenko, M. I. Krivoruchenko, and F. Šimkovic, "Interpolating Formula for the $0\nu\beta\beta$-Decay Half-Life in the Case of Light and Heavy Neutrino Mass Mechanisms," *Phys. Rev. D* **98**, 015003 (2018)

[4] A. Babič, D. Štefánik, M. I. Krivoruchenko, and F. Šimkovic, "Bound-State Double-β Decay," *Phys. Rev. C* **98**, 065501 (2018)

[5] F. Šimkovic, A. Babič, S. G. Kovalenko, and M. I. Krivoruchenko, "Favored Neutrino Mass Mechanisms of the $0\nu\beta\beta$-Decay Unified by an Interpolating Formula," *J. Phys.: Conf. Ser.* **1056**, 012054 (2018)

[6] A. Babič, D. Štefánik, M. I. Krivoruchenko, and F. Šimkovic, "Bound-State Double-Beta Decay," *J. Phys.: Conf. Ser.* **1056**, 012002 (2018)

[7] A. Babič, D. Štefánik, M. I. Krivoruchenko, and F. Šimkovic, "Neutrinoless and Two-Neutrino Double-Beta Decay with Emission of Single Free Electron," *Nucl. Theory* **36**, 75–83 (2017)

[8] A. Babič, D. Štefánik, M. I. Krivoruchenko, and F. Šimkovic, "Double-Beta Decay with Emission of Single Free Electron," *AIP Conf. Proc.* **1894**, 020001 (2017)

[9] A. Babič and F. Šimkovic, "Scattering of Low-Energy Neutrinos on Atomic Shells," *AIP Conf. Proc.* **1686**, 020002 (2015)

[10] V. B. Belyaev and A. Babič, "Solving the Schrödinger Equation with Power Anharmonicity," *arXiv:1409.5086 [quant-ph]* (2014)

[11] A. Babič and F. Šimkovic, "Majorana Phases, CP Violation, Sterile Neutrinos and Neutrinoless Double-Beta Decay," *AIP Conf. Proc.* **1572**, 7–10 (2013)

2020: Grant of the Plenipotentiary Representative of the Czech Republic in JINR, "Double-Beta Decay and Electron Capture as Probes of Fundamental Neutrino Properties," Contract No. 202 from 24/03/2020 (6,000 USD)

2019: Grant of the Plenipotentiary Representative of the Czech Republic in JINR, "Search for Neutrino Mass in Modern Beta-Decay Experiments," Contract No. 208 from 02/04/2019 (6,000 USD)

2018: Grant of the Plenipotentiary Representative of the Czech Republic in JINR, "Lepton-Number Violation in Atoms and in Double-Beta Decay," Contract No. 192 from 05/04/2018 (5,000 USD)

2017: Grant of the Plenipotentiary Representative of the Czech Republic in JINR, "Atomic Effects in Double-Beta Decay and Neutrino Interactions," Contract No. 203 from 31/03/2017 (5,000 USD)

2016: Grant of the Plenipotentiary Representative of the Czech Republic in JINR, "Particle Collisions in Detectors of Rare Processes," Contract No. 189 from 29/03/2016 (6,000 USD)

2015: Grant of the Plenipotentiary Representative of the Czech Republic in JINR, "Energy and Wavefunction of Ground State of Superheavy Hyperhydrogens 6H-Lambda and 6H-2Lambda," Contract No. 142 from 02/03/2015 (6,000 USD)

SCHOOLS & CONFERENCES

October 2019: Jubilee Seminar of Prof. F. Šimkovic, Dubna, Russia
Organizer

September 2019: VIII International Pontecorvo Neutrino Physics School, Sinaia, Romania
F. Šimkovic, *Proceedings of Student Poster Session*, ISBN: 978-5-9530-0538-8, JINR: Dubna (2020) | Editor & Member of the Organizing Committee

May 2019: Workshop on Calculation of Double-Beta-Decay Matrix Elements (MEDEX'19), Prague, Czech Republic

November 2018: JUNO PMT Shift, Zhongshan, China
3 weeks

June 2018: Jubilee Seminar of Prof. S. M. Bilenky, Dubna, Russia
Organizer

January 2018: 11th JUNO Collaboration Meeting, Nanjing, China

November 2017: SuperNEMO Collaboration Meeting, Orsay, France
"Neutrinoless and Two-Neutrino Bound-State Double-Beta Decay"

October 2017: Conference on Neutrino and Nuclear Physics, Catania, Italy
"Double-Beta Decay with Emission of Single Electron"

August 2017: VII International Pontecorvo Neutrino Physics School, Prague, Czech Republic
F. Šimkovic, *Proceedings of Student Poster Session*, ISBN: 978-5-9530-0484-8, JINR: Dubna (2018) | Editor

July 2017: 10th JUNO Collaboration Meeting, Beijing, China

July 2017: Helmholtz International Summer School "Nuclear Theory and Astrophysical Applications," Dubna, Russia
"Neutrinoless and Two-Neutrino Double-Beta Decay with Emission of Single Electron"

June 2017: 36th International Workshop on Nuclear Theory, Rila, Bulgaria
"Neutrinoless and Two-Neutrino Double-Beta Decay with Emission of Single Electron"

May 2017: Workshop on Calculation of Double-Beta-Decay Matrix Elements (MEDEX'17), Prague, Czech Republic
"Double-Beta Decay with Emission of Single Electron"

May 2017: JUNO European Collaboration Meeting, Catania, Italy

October 2016: "New Trends in High-Energy Physics," Bečići, Montenegro
"Neutrinoless Double-Beta Decay with Emission of Single Electron"

August 2016: 28th Indian-Summer School of Physics "Ab Initio Methods in Nuclear Physics," Prague, Czech Republic
"Neutrinoless Double-Beta Decay with Emission of Single Electron"

April 2016: International Session-Conference of SNP PSD RAS "Physics of Fundamental Interactions," Dubna, Russia

February 2016: 52nd Winter School of Theoretical Physics "Theoretical Aspects of Neutrino Physics," Lądek-Zdrój, Poland

November 2015: Colloquium towards CP Violation in Neutrino Physics, Prague, Czech Republic

August 2015: VI International Pontecorvo Neutrino Physics School, Horný Smokovec, Slovakia
"On the Possibility of Leptonic CP Violation Due to Majorana Neutrinos" (poster) | awarded top 5

July 2015: Dynasty Foundation Summer School "Theoretical Problems of Physics of Fundamental Interactions," Zelenogorsk, Russia

June 2015: Workshop on Calculation of Double-Beta-Decay Matrix Elements (MEDEX'15), Prague, Czech Republic
"Scattering of Low-Energy Neutrinos on Atomic Shells"

February 2015: XIX International Scientific Conference of Young Scientists and Specialists, Dubna, Russia
"On the Possibility of Leptonic CP Violation Due to Majorana Neutrinos"

September 2014: Summer School and Workshop on the Standard Model and Beyond, Corfu, Greece

July 2014: Helmholtz International Summer School "Nuclear Theory and Astrophysical Applications," Dubna, Russia
"On the Detection of Solar Neutrinos and Reactor Antineutrinos via Scattering on Atomic Electrons"

July 2014: 2014 Student Practice in JINR Fields of Research, Dubna, Russia
"Few-Body Dynamics of Light Hypernuclei"

April/May 2014: Student Science Conference 2014, Bratislava, Slovakia / 5th Czecho-Slovak Student Science Conference in Physics, Prague, Czech Republic
"On the Detection of Solar Neutrinos and Reactor Antineutrinos via Scattering on Atomic Electrons" | 1st prize in Particle and Nuclear Physics

July 2013: 2013 Student Practice in JINR Fields of Research, Dubna, Russia
"New Method for Solving the Schrödinger Equation with Power Nonlinearity in Interactions"

June 2013: Workshop on Calculation of Double-Beta-Decay Matrix Elements (MEDEX'13), Prague, Czech Republic
"On the Possibility of Leptonic CP Violation Due to Majorana Neutrinos"

April/May 2013: Student Science Conference 2013, Bratislava, Slovakia / 4th Czecho-Slovak Student Science Conference in Physics, Bratislava, Slovakia
"On the Possibility of Leptonic CP Violation Due to Majorana Neutrinos" | 1st prize in Nuclear and Elementary Particle Physics

September 2012: International Workshop on Models of Neutrino Mass "Behind the Neutrino Mass," Trieste, Italy

September 2012: 24th Indian-Summer School of Physics "Understanding Neutrinos," Prague, Czech Republic

August 2012: Dynasty Foundation Summer School "Fundamental Interactions," Protvino, Russia

July 2012: Summer School on Cosmology, Trieste, Italy

April/May 2012: Student Science Conference 2012, Bratislava, Slovakia / 3rd Czecho-Slovak Student Science Conference in Physics, Prague, Czech Republic
"Absolute Neutrino Mass Scale and Sterile Neutrinos" (in Slovak)

July 2011: Helmholtz International Summer School "Nuclear Theory and Astrophysical Applications," Dubna, Russia

Education & Employment

2017 – 2020: JUNO Collaboration (member)

2015 – 2021: Joint Institute for Nuclear Research, Bogoliubov Laboratory of Theoretical Physics (junior researcher)

2015 – Present: Czech Technical University in Prague, Institute of Experimental and Applied Physics (researcher)

2014 – Present: Czech Technical University in Prague, Faculty of Nuclear Sciences and Physical Engineering (PhD study of Nuclear Engineering)
Thesis: "Neutrino Interactions with Atoms and Double-Beta Decay" (supervisor: M. I. Krivoruchenko)

2009 – 2014: Comenius University in Bratislava, Faculty of Mathematics, Physics and Informatics (Master's degree in Nuclear and Subnuclear Physics)
Thesis: "Oscillations of Stable and Unstable Neutrinos and Their Scattering on Atomic Electrons" (supervisor: F. Šimkovic)

Skills & Interests

Language: Slovak (native), Czech, English, Russian

IT: Microsoft Windows™, Linux; Microsoft Office™, LaTeX; Wolfram Mathematica™, C; Bash, AWK, GRASP2K

Research: Theory and phenomenology of neutrino mixing, masses, oscillations, and interactions, and of neutrinoless and two-neutrino double-beta decay