Probing new physics in the laboratory and in space

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List of publications

[1] A. Boyarsky, M. Ovchynnikov, V. Syvolap, N. Sabti, "Upper bound on neutrino mass from cosmological observations in presence of Heavy Neutral Leptons", in preparation

[2] I. Boiarska, A. Boyarsky, O. Mikulenko, M. Ovchynnikov, "Constraints from the CHARM experiment on Heavy Neutral Leptons with tau mixing", submitted to Phys.Rev.D, arXiv:2107.14685

[3] A. Boyarsky, O. Mikulenko, M. Ovchynnikov, L. Shchutska, "Searches for new physics at SND@LHC", submitted to JHEP, arXiv:2104.09688

[4] A. Boyarsky, M. Ovchynnikov, N. Sabti, V. Syvolap, "When feebly interacting massive particles decay into neutrinos: The $N_{\rm eff}$ story", Phys.Rev.D 104 (2021) 3, 035006, arXiv:2103.09831

[5] A. Boyarsky, M. Ovchynnikov, O. Ruchayskiy, V. Syvolap, "Improved BBN constraints on Heavy Neutral Leptons", Phys.Rev.D 104 (2021) 2, 023517, arXiv:2008.00749

[6] I. Boiarska, K. Bondarenko, A. Boyarsky, M. Ovchynnikov, O. Ruchayskiy *et al.*, "Light scalar production from Higgs bosons and FASER 2", JHEP 05 (2020) 049, arXiv:1908.04635

[7] I. Boiarska, K. Bondarenko, A. Boyarsky, V. Gorkavenko, M. Ovchynnikov *et al.*, "Phenomenology of GeV-scale scalar portal ", JHEP 11 (2019) 162, arXiv:1904.10447

[8] K. Bondarenko, A. Boyarsky, M. Ovchynnikov, Oleg Ruchayskiy, L. Shchutska, "Probing new physics with displaced vertices: muon tracker at CMS ", Phys.Rev.D 100 (2019) 7, 075015, arXiv:1903.11918

[9] K. Bondarenko, A. Boyarsky, M. Ovchynnikov, O. Ruchayskiy, "Sensitivity of the intensity frontier experiments for neutrino and scalar portals: analytic estimates ", JHEP 08 (2019) 061, JHEP 2019, arXiv:1902.06240

[10] I. Boiarska, K. Bondarenko, A. Boyarsky, S. Eijima, M. Ovchynnikov, O. Ruchayskiy, I. Timiryasov, "Probing baryon asymmetry of the Universe at LHC and SHiP", arXiv:1902.04535

[11] *SHiP Collaboration*, C. Ahdida *et al.*, "Sensitivity of the SHiP experiment to dark photons decaying to a pair of charged particles", Eur.Phys.J.C 81 (2021) 5, 451, arXiv:2011.05115

[12] *SHiP Collaboration*, C. Ahdida *et al.*, "Sensitivity of the SHiP experiment to light dark matter", JHEP 04 (2021) 199, arXiv:2010.11057

[13] *SHiP collaboration*, C. Ahdida *et al.*, "SND@LHC", rep. num. CERN-LHCC-2020-002, LHCC-I-035, arXiv:2002.08722

[14] *SHiP collaboration*, C. Ahdida *et al.*, "The experimental facility for the Search for Hidden Particles at the CERN SPS", JINST 14 (2019) 03, P03025, arXiv:1810.06880

[15] *SHiP collaboration*, C. Ahdida *et al.*, "Sensitivity of the SHiP experiment to Heavy Neutral Leptons", JHEP 04 (2019) 077, arXiv:1811.00930. **Contributing author.**

Curriculum vitæ

I was born in Kyiv, Ukraine, on the 16th of April 1994. I have received my primary education at the school #304.

After finishing the school, I entered the Physics Department of the Taras Shevchenko National University of Kyiv in 2011, where I have got the bachelor's degree in 2015 and the master's degree in 2017. My master thesis was titled "Generation of primordial magnetic fields by axion-like particle dark matter". After graduation, I started my PhD at the Leiden Institute of Physics under the supervision of Dr. Alexey Boyarsky.

While being a PhD student, I was a teaching assistant for the courses "Effective field theory", "Origin and structure of the Standard model", and "Particle Physics in the Early Universe". I have become a member of the SHiP and SND@LHC collaborations, and studied the sensitivity of these experiments to different models of new physics. I have visited a number of schools and conferences in the Netherlands, Germany, Switzerland.

Acknowledgements

I want to thank my supervisor Alexey Boyarsky for guidance during the years of my bachelor's and master's studies and graduate school.

I am thankful for my second promotor Ana Achúcarro and my collaborators, Oleg Ruchayskiy, Lesya Shchutska, Kyrylo Bondarenko, Alex Mikulenko, Nashwan Sabti, Vsevolod Syvolap for kindness, gaining experience, and spending many hours in discussions. I would especially like to mention Kyrylo Bondarenko, who was very kind to help me start my research in searching for new physics at accelerators.

The Lorentz Institute has been a hospitable environment all these years.

I would also like to thank Nashwan Sabti for help with the Dutch translation. I am grateful the secretary of our institute, Fran, for the help in all sorts of practical things, and all the colleagues at the Lorentz Institute for providing the great atmosphere.

Finally, I would like to thank my family: my wife Iryna, who supported me both in my scientific research and in the life behind the science, my newborn son Matvii, who gave me an opportunity to keep working on my thesis. I am grateful to my parents, Oksana and Yurii, for bringing me up.