Valeriia (Lera) Lukashenko

Curriculum Vitae

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Education

2019 – present **PhD. Physics**, *Nikhef/Vrije Universiteit Amsterdam.*
- Supervisors: Prof. Dr. Gerhard Raven, Dr. Wouter Hulsbergen
- Focus on CP-violation measurement in Standard Model and Beyond the Standard Model searches

2017 – 2019 **MSc. Physics and Astronomy**, *University of Amsterdam/Vrije Universiteit Amsterdam (joint degree)*, Cum Laude.
- Gravitational, Astro- and Particle Physics track
- Master's thesis on the search for long-lived heavy neutrinos in the $W^+ \to \mu^+\mu^\pm jet$ decays at LHCb under the supervision of Dr. Wouter Hulsbergen and Dr. Elena Dall'Occo

2013 – 2017 **BSc. Applied Physics**, *Taras Shevchenko National University of Kyiv*, graduated with honours.
- Bachelor's thesis on the measurement of differential production cross-sections of Λ-baryons in pPb collisions at 5 TeV energy at LHCb under the supervision of Prof. Dr. Valery Pugach

2002 – 2013 **Secondary education**, *International Relations Lyceum #51*, Kyiv, graduated with highest honours.

Research experience

2021 – present **Search for exotic heavy neutrinos in the $B^+ \to \mu^\pm e^\pm \pi^\mp$ decays at LHCb**, *sensitivity studies, event selection.*

2022 **LHCb Vertex Locator commissioning**, *FE ASIC equalisation.*

2020 – 2023 **Measurement of CP-violating phase ϕ_s in $B_s^0 \to J/\psi K^+K^-$ decays with full Run 2 LHCb data**, *statstical background subtraction with mass fit, decay time resolution, time-dependent angular fit.*

2020 – 2021 **Comparison of tracking in the GPU and CPU-based triggers at LHCb**, *multiple scattering description in GPU-based track fit, comparison of track reconstruction between CPU and GPU implementations.*

2019 – 2020 **Development of reconstruction monitoring algoritms**, *track hits resolution monitors for simulation.*

2018 – 2019 **Search for long-lived heavy neutrinos in $W^+ \to \mu^+\mu^\pm jet$ decays**, *Master thesis; event selection, efficiency, expected upper limit.*

2018 **LHCb Ring Image Cherenkov Detector FE ASIC calibration and multi-anode PMT characterisation**, *CERN Summer Student Project; FE: threshold scans; PMT: gain, pedestal position, occupancy.*

2017 **Λ_b^0 differential production cross-section in pPb collisions at $\sqrt{s} = 5$ TeV at LHCb**, *Bachelor thesis; event selection.*

Publications

exp. 2023 **Improved measurement of CP violation parameters in $B_s^0 \to J/\psi K^+K^-$ decays**, *Aaij, R. et al.(LHCb Collaboration)*, In Preparation (to be submitted to PRL), **proponent**.

exp. 2023 **The LHCb Vertex Locator in Upgrade I**, *V. Lukashenko on behalf of LHCb VELO team*, to appear in Proc. of the 31st International Workshop on Vertex Detectors, 24-18 October 2022, Tateyama, Japan.

2022 **Keeping decay times under control: decay time resolution for CP-violation in $B_s^0 \to J/\psi\phi$**, *V. Lukashenko*, Proc. of the 56th RENCONTRES DE MORIOND Electroweak Interactions and Unified Theories, 12-19 March 2022, La Thuile, Italy, 475.

2022 **Recent LHCb results on CP violation in beauty decays to charmonia**, *V. Lukashenko on behalf of LHCb collaboration*, Proc. of The European Physical Society Conference on High Energy Physics — PoS(EPS-HEP2021), 26 -30 July 2021, online, **398**, 550.

2021 **Search for heavy neutral leptons in $W^+ \to \mu^+\mu^\pm$jet decays**, *Aaij, R. et al.(LHCb Collaboration)*, Eur. Phys. J. C **81**, 248, **proponent**.

Conference talks

2023 **Conference on Flavour Physics and CP Violation (FPCP)**, *"New CPV measurements at LHC"*, plenary talk, on behalf of LHCb, ATLAS and CMS collaborations.

2023 **NWO Physics**, *"ϕ_s - the key to understanding matter and anti-matter"*.

2022 **International Workshop on Vertex Detectors (Vertex)**, *"The LHCb Vertex Locator in Upgrade I"*, on behalf of LHCb VELO team.

2022 **Rencontres de Moriond Electroweak Interactions and Unified Theories (Moriond EW)**, *"Keeping decay times under control : decay time resolution for CP-violation in $B_s^0 \to J/\psi\phi$"*, young scientist forum, on behalf of LHCb collaboration.

2021 **European Physical Society Conference on High Energy Physics (EPS-HEP)**, *"Recent LHCb results on CP violation in beauty decays to charmonia"*, on behalf of LHCb collaboration.

Posters

2021 **NWO Physics**, *" Time resolution in the measurement of the CP-violating phase ϕ_s"*.

2017 **Annual Scientific Conference of Kyiv Institute for Nuclear Research**, *"Production cross-section of Λ-baryons in pPb collisions at 5 TeV energy"*, (ukr).

2017 **Science of XXI: modern problems of physics**, *"Nuclear modification factor of Λ-baryons in pPb collisions at 5 TeV energy"*, young scientists conference (ukr).

Teaching Experience

Lecturer **Inverted CERN School of Computing**, *two lectures on Kalman filter for track fitting*, 2023.

Lecturer **CERN Ukrainian Teacher Programme**, *lecture on tracking detector technologies and virtual visit at Nikhef*, 2022.

Lecturer and assistant **LHCb Starterkit software training**, *lectures on LHCb software*, 2020/2021/2022.

Teaching assistant **Particle Physics I**, *Master course, 6 EC*, 2020/2021.

Teaching assistant **Programming for MNW** , *Bachelor course, 3 EC*, python, 2021.

Supervision **Bachelor thesis of Niels Ruijter**, 2020.

Course material **Statistical Physics**, *Bachelor course, 6 EC*, developed 9 three-week long practical projects together with assoc. Prof. Dr. Greg Stephens, 2018.

Research Visits

Apr – Oct 2022 **CERN**, *Vertex Locator commissioning.*

Sep 2021 **University Santiago de Compostela**, *Measurement of CP-violating phase ϕ_s in $B_s^0 \to J/\psi K^+K^-$ decays with full Run 2 LHCb data.*

Training

2022 **BND School: Quantum Chromodynamics**.

2022 **Thematic CERN School of Computing: heterogeneous architectures**.

2019 – 2022 **Nikhef Topical lectures in particle physics**, *CP Violation, Neutrinos Physics, Statistics, Signal Processing and Reconstruction, Cosmic Rays, Higgs Physics.*

2019 **LHCb Starterkit software training**, *Introductory training on LHCb software.*

2018 **Sarajevo School of High Energy Physics**.

Organisation

2022 **LHCb Run 3 Starterkit software training**, *1 week software workshop for PhD students, postdoctoral researchers, senior researchers on new LHCb software.*

2021 **Annual LHCb Starterkit software training**, *1 week software workshop for newcomers*, Run 1/Run 2.

Honours and awards

2018 The Moritz Karbach LHCb Summer Student Prize

2017 – 2019 Amsterdam Merit Scholarship

2017 Holland Scholarship

2016 Student Physics Tournament XV, Kyiv, Ukraine, 2nd place in team ranking, 3rd place in individual ranking

2014 – 2017 State Academical Excellence monthly scholarship

Outreach and passions

Presenter at the Ukrainian science fair 2023, Amsterdam

Open Days in Science Park Amsterdam 2019, 2022

Judge at physics and natural science student tournaments in Ukraine

Volunteer for “Ukrainians in The Netherlands" foundation

Volunteer teacher in Ukrainian school “Dzherelo", Amsterdam

Theater and acting

Philosophy meetup “Socrates Cafe"

Computer skills

C++ I worked on the track reconstruction software at LHCb. I am familiar with C++14 and C++17 standards.

python I used python for data analysis.

ROOT I used RooFit for a multidimentional simultaneous log-likelihood fit.

WinCC OA I worked on Vertex Locator panels at LHCb. I know basic syntax, enough to create my own panels.

git I contributed on a daily basis to collaboration-wide projects. I created CI tests for analysis git pages.

snakemake I used snakemake workflow manager to build data analysis pipelines.

Languages

Ukrainian Native

English Fluent

Dutch Basic