

# Dimitrii Krasnopevtsev

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## CONTACTS

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## EDUCATION

**2012 – 2017**

**Ph.D. in High energy physics**

Moscow Engineering Physics Institute  
Lebedev Physical Institute

Throughout my Ph.D., I participated in ATLAS experiment and played an important role in advancing the study of neutral gauge bosons and searches for Physics beyond the Standard Model. Employing a rigorous approach to data analysis, I made significant contributions that culminated in the publication of two papers in high-impact journals. During this period, I dedicated a substantial amount of time to software development and the calibration of Transition Radiation Tracker. This endeavor not only equipped a large collaboration of physicists, involving over 3,000 individuals, with a high-precision instrument but also provided invaluable support to numerous research initiatives.

## RESEARCH

**August 2020 – Present**

**Research Scientist**

Massachusetts Institute of Technology (MIT)

I have started my appointment at MIT as Postdoctoral Associate and was promoted to Research Scientist in 2024. My research work is focused on measurements of cosmic-ray positrons and electrons spectra. My recent results reveal unique properties of elementary particle fluxes and indicate the existence of a primary source of high-energy electrons and positrons, associated with either Dark Matter or astrophysical origin.

- My responsibilities extend to intensive involvement in software development for AMS experiment subsystems, including the implementation of particle tracking algorithms and the integration of machine learning tools for particle identification.
- My expertise lies in Big Data analysis, dealing with 1 petabyte-scale datasets using sophisticated statistical methods. This involves signal sampling through machine learning techniques, establishing data-to-model correspondence using complex fitting procedures, identifying systematic errors.
- During my shifts at AMS Payload Operations Control Centre in Geneva I lead a large team of engineers and scientists ensuring seamless and successful AMS data taking in close collaboration with NASA's Johnson Space Center in Houston.
- I regularly present talks at major scientific international conferences (ICRC2020, ICHEP2022, TEVPA2023, COSPAR2024).

**April 2018 – August 2020**

**Postdoctoral researcher**

University of Science and Technology of China (USTC)

I participated in ATLAS experiment and my work was focused on measuring the rare Higgs boson decays and conducting searches for Dark Matter.

- The outcomes of my investigations resulted in the publication of three highly cited papers, amassing over 350 citations collectively. In recognition of my contributions, I was honored with a President's International Fellowship from the Chinese Academy of Sciences.
- I was acknowledged for my leadership skills and appointed as research coordinator within an international group comprising 35 physicists. I led a machine learning-based method that enhanced research methods sensitivity, surpassing a similar publication by the competing CMS collaboration.

- I conducted key studies evaluating Resistive Plate Chambers performance at high occupancy, which crucial for ATLAS operation at High Luminosity LHC.

## Teaching

**2014–2020**

**Laboratory assistant, lecturer**

CERN, MEPhI, USTC

I possess experience in teaching and advising students from diverse backgrounds around the globe. As a postdoctoral scientist, I actively mentored both undergraduate and graduate students, providing guidance in their research endeavors.

- I served as an assistant in the elementary particle laboratory at MEPhI, where I curated materials for lectures on data analysis from particle experiments. I facilitated laboratory workshops for groups of up to 10 students.
- At CERN I delivered introductory lectures (up to 100 attendees), guiding early-career scientists along the Ph.D. path within large collaborations.
- In recognition of my expertise, I was invited to conduct a series of seminars at MEPhI and USTC, focusing on analysis methods for Big Data from particle experiments.

## GRANTS

I have international and successful experience in fund applications:

- Chinese Academy of Sciences President's International Fellowship in 2019;
- Early Career Researcher grant from the Russian Fund of Fundamental Science in 2016.

## HONOURS

I am a recipient of prestigious awards and scholarships:

- CERN-Fermilab Hadron Collider Physics Summer Scholarship in 2017;
- MEPhI Best Ph.D. student award in 2013;
- CERN summer scholarship in 2011.

## SKILLS

Programming: C++, python, bash

Expertise: ROOT (data analysis framework), TMVA (toolkit for machine learning), VIM, LATEX, Gitlab, WinCC OA, Grafana, IVoDS, ZOOM, Microsoft Office

Languages: Russian (native speaker), English (Advanced), French (Intermediate)

## SEMINARS

- "Origin of Cosmic-Ray Electrons and Positrons results from Alpha Magnetic Spectrometer", Nuclear Physics and High Energy Laboratory, Sorbonne University, Paris, France, June 2024
- "Identification of cosmic-ray positrons and electrons at TeV energy scale with the Alpha Magnetic Spectrometer", MIT, Cambridge, MA, USA, March 2024
- "Latest measurements of cosmic ray elementary particles with the Alpha Magnetic Spectrometer on the International Space Station", Kavli Institute for Particle Astrophysics and Cosmology, Stanford University, California, USA, March 2024
- "Origin of Cosmic-Ray Electrons and Positrons", Laboratory of Subatomic Physics and Cosmology, Grenoble, France October 2023
- "How to do a PostDoc and searches for rare Higgs boson decays with ATLAS", Moscow Engineering Physics Institute, Moscow, Russia, March 2020
- "Search for Beyond of Standard Model physics with Mono-Z signature at ATLAS", University of Science and Technology of China, Hefei, China, April 2019
- "Neutral multi-boson production in ATLAS and searches for new physics", Shanghai Jiao Tong University, Shanghai, China, April 2018