

## Alexander V. Belikov

---

alexander-belikov.github.io  
Paris, France

abelikov@gmail.com  
+33 (0) 787 84 84 23

### Citizenship

Russia

### Education

2005 - 2011 Ph.D. in Physics, University of Chicago, advisor Dr. Dan Hooper  
2003 - 2005 M.A. in Physics (*summa cum laude*), Moscow Institute of Physics and Technology  
1999 - 2003 B.S. in Physics (*summa cum laude*), Moscow Institute of Physics and Technology

### Professional Experience

2002-2003	Troitsk, Insitute of Spectroscopy	junior researcher
2003-2005	Moscow, Kintech	junior researcher
2006-2011	Chicago, University of Chicago	research assistant
2011-2013	Paris, Institute of Astrophysics	postdoctoral researcher
2014-2015	New York, JP Morgan Chase	quantitative researcher
2015-2016	New York, Barclays Capital	quantitative researcher
2016-2019	Chicago, University of Chicago, Knowledge Lab	postdoctoral researcher
2019-present	Paris, Hello Watt	Head of Data Science

### Teaching Experience

Mechanics (Honors), University of Chicago, Fall 2005  
Electricity and Magnetism, University of Chicago, Winter 2006  
Waves, Optics and Modern Physics, University of Chicago, Spring 2006  
Labs for Quantum Mechanics II, University of Chicago, Fall 2006  
Mathematical Methods, University of Chicago, Spring 2007  
Quantum Field Theory I and II, University of Chicago, Winter 2008  
Particle physics, University of Chicago, Spring 2010

### Conferences and Talks

6th International Workshop Fullerenes and Nanoclusters 2003, Saint Petersburg, Russia  
Dark Matter Annihilation and the Interstellar Medium 2009, Fermilab, Batavia IL  
PHENO 2010, Madison WI  
CCAPP, Ohio State University, October 2010  
SCIPP, University of California Santa Cruz, November 2010  
KIPAC, Stanford, November 2010  
CCPP, New York University, November 2010  
47th Moriond meeting, March 2012  
GRAPPA, Amsterdam, April 2012  
ICTP, Trieste, July 2012  
Identification of Dark Matter 2012, Chicago, July 2012  
INR, Moscow, October 2012

TEP, UCLA, October 2012  
FNAL, October 2012  
ANL, October 2012  
UMN, October 2012  
UW Madison, October 2012  
UIUC, October 2012  
GDR Terascale, Paris, November 2012  
Closing in on DM, Aspen, January 2013  
Amsterdam-Paris-Stockholm meeting, IAP, Paris, December 2013  
Big Mechanism PI Meeting, Washington DC, 2017  
Complex Networks, Como, Italy, 2018  
Data Science Summer School, École polytechnique, France, 2018  
Ground Truth PI Meeting, Washington DC, 2019

### **Awards and Honors**

Dynasty Foundation Stipend, 2002  
Sachs Fellowship, University of Chicago, 2006  
McCormick Fellowship, University of Chicago, 2005-2007

### **Professional service**

Reviewer for AMS (2009-2010)  
Reviewer for Physics Letters B (2010-2013)  
Reviewer for PLOS Computational Biology (2019-present)

### **Computational skills**

Linear models, graphical models, decision trees, ensemble methods, random forest, SVM, regularization, optimal transport.  
NLP, network analysis, topic modeling. RNN, LSTM, RL, MPNN, GNN, Q-learning, graph neural networks.  
Python (pandas, numpy, scikit-learn, pytorch, nltk, spacy, pymc3, networkx, igraph, pyro), C++, R, Spark, Haskell, Java. SQL, SPARQL, mongoDB, ArangoDB. Git, bash.

### **References**

Professor **James Allen Evans**  
Department of Sociology  
University of Chicago  
Phone: +1-773-834-3612  
Email: [jevans@uchicago.edu](mailto:jevans@uchicago.edu)  
Professor **Andrey Rzhetsky**  
Institute for Genomics and Systems Biology  
The University of Chicago  
Phone: +1-773-834-7367  
Email: [arzhetsk@medicine.bsd.uchicago.edu](mailto:arzhetsk@medicine.bsd.uchicago.edu)

Professor **Dan Hooper**  
Department of Astronomy and Astrophysics  
University of Chicago  
Phone: +1-630-840-8195  
Email: [dhooper@fnal.gov](mailto:dhooper@fnal.gov)

Doctor **Emmanuel Moulin**  
Commissariat à l’Energie Atomique (CEA)  
Centre de Saclay – F-91191 Gif-sur-Yvette Cedex  
Phone: +33 (0)1 69 08 29 60  
Email: [emmanuel.moulin@cea.fr](mailto:emmanuel.moulin@cea.fr)

### List of Publications

1. “Unsupervised Non-Parametric Signal Disaggregation Using Bayesian Neural Networks”, A. Belikov, A. Montanari, E. Moulin, in preparation.
2. “Using analyst community signals for predicting stock prices”, A. Belikov, J. Evans, in preparation.
3. “Predicting of career transitions in large companies using graph neural methods”, A. Belikov, V. Yakubovich, in preparation.
4. “Domain Knowledge Aids in Signal Disaggregation; the Example of the Cumulative Water Heater”, A. Belikov, G. Matheron, J. Sassi, (2022), Submitted to Energy and Buildings.
5. “Data on How Science Is Made Can Make Science Better”, J. Sourati, A. Belikov, J. Evans, Harvard Data Science Review 4.2 (2022).
6. “Prediction of robust scientific facts from literature”, A. Belikov, A. Rzhetsky, J. Evans, Nature Machine Intelligence (2022).
7. “Bayesian model of electrical heating disaggregation”, F. Culiere, L. Leduc, A. Belikov, (2020), Proc. of NILM 2020.
8. “Creating Training Data for Scientific Named Entity Recognition with Minimal Human Effort”, R. Tchoua, A. Ajith, Z. Hong, L. Ward, K. Chard, A. Belikov, D. Audus, S. Patel, J. Pablo, T. Foster ICCS, 319, (2019).
9. “Study of the very high energy gamma-ray spectrum from the Galactic Center and future prospects”, A. Belikov, E. Moulin, J. Silk, Phys. Rev. D 94, 103005 (2016).
10. “Diffuse Gamma Ray Background from Annihilating Dark Matter in Density Spikes around Super-massive Black Holes”, A. Belikov, J. Silk, Phys. Rev. D 89, 043520 (2014).
11. “Super-exponential Cutoff as a Probe of Annihilating Dark Matter”, A. Belikov, J. Silk, Phys. Rev. Lett. 111, 071302 (2013).
12. “Equivalence Principle Violation in Weakly Vainshtein-Screened Systems”, A. Belikov, W.Hu, Phys. Rev. D 87, 084042 (2013).
13. “Neutron injection during primordial nucleosynthesis alleviates the primordial  ${}^7\text{Li}$  problem”, D. Albornoz Vasquez, A.V. Belikov, A. Coc, J. Silk, E. Vangioni, Phys. Rev. D 86, 063501 (2012).
14. “Study of the Gamma-ray Spectrum from the Galactic Center in view of Multi-TeV Dark Matter Candidates”, A. V. Belikov, G. Zaharijas, J. Silk, Phys. Rev. D 86, 083516 (2012).
15. “The Isotropic Radio Background and Annihilating Dark Matter”, D. Hooper, A. V. Belikov, T. E. Jeltema, T. Linden, S. Profumo, T. R. Slatyer, Phys. Rev. D 86, 103003 (2012).
16. “Searching For Dark Matter Subhalos In the Fermi-LAT Second Source Catalog”, A. V. Belikov, D. Hooper, M. Buckley, Phys.Rev.D86 043504 (2012).

17. “CoGeNT, DAMA, and Light Neutralino Dark Matter”, A. V. Belikov, J. F. Gunion, D. Hooper, T.M.P. Tait, *Phys.Lett. B* **705** (2011) 82-86.
18. “No Indications of Axion-Like Particles From Fermi”, A. V. Belikov, L. Goodenough, D. Hooper, *Phys.Rev.D* **83** 063005 (2011).
19. “CoGeNT, DAMA, and Neutralino Dark Matter in the Next-To-Minimal Supersymmetric Standard Model”, J. F. Gunion, A. V. Belikov, D. Hooper, arXiv:1009.2555.
20. “The Contribution Of Inverse Compton Scattering To The Diffuse Extragalactic Gamma-Ray Background From Annihilating Dark Matter”, A. V. Belikov, D. Hooper, *Phys.Rev.D* **81**, 043505 (2010).
21. “How Dark Matter Reionized The Universe”, A. V. Belikov, D. Hooper, *Phys.Rev.D* **80**, 035007 (2009).
22. “Identifying Dark Matter Annihilation Products In The Diffuse Gamma Ray Background”, S. Dodelson, A. V. Belikov, D. Hooper, P. Serpico J., *Phys.Rev.D* **80**, 083504 (2009).
23. “Statistics of Harmonic Measure and Winding of Critical Curves from Conformal Field Theory”, A. Belikov, I. A. Gruzberg, I. Rushkin, *J. Phys. A: Math. Theor.*, **41**, 285006 (2008).
24. “Band Structure Calculation of Metallic Photonic Crystals: Modified Plane-wave Method”, A. V. Belikov, M.V. Bogdanova, Yu. E. Lozovik, *Matem. Mod.*, **19**, 19 (2007).
25. “Ground-state Properties of a One-dimensional System of Dipoles”, A. S. Arkhipov, G. E. Astrakharchik, A. V. Belikov, Yu. E. Lozovik, *JETP Letters*, **82**, 1 (2005).
26. “Double-wall Nanotubes: Classification and Barriers to Walls Relative Rotation, Sliding and Screw-like Motion”, A. V. Belikov, Yu. E. Lozovik, A. G. Nikolaev, and A. M. Popov, *Chem. Phys. Lett.*, **385**, 72 (2004).