

# Oleg Kamaev

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Ontario, Canada

## SUMMARY OF QUALIFICATIONS

- Over 5 years of experience in quantitative data analysis, mathematical modeling of physical processes, numerical programming.
- Solid academic background in Physics, Applied Mathematics, Statistical Analysis.
- Author and co-author of over 20 publications in peer-reviewed journals and proceedings of national and international conferences.
- A quick learner who can communicate clearly and effectively.
- Highly energetic and result-oriented with strong analytical and problem-solving skills.

### Areas of Expertise:

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|------------------------|---------------------------|------------------------|
| - data mining          | - statistical inference   | - algorithms design    |
| - machine learning     | - relational databases    | - software development |
| - predictive analytics | - Monte Carlo simulations | - technical writing    |

### Technical Skills:

- Programming languages: MATLAB, Python, Fortran
- Relational databases: MySQL, MS Access
- Version control systems: CVS, Git
- UNIX environments: Linux, Mac OS
- Statistical techniques: regression, MLE, nonlinear optimization, pattern search, principal component analysis, neural networks
- Application software: MS Excel, VBA macros, MS PowerPoint, Origin, LaTeX, Emacs, HTML

## EXPERIENCE

### Research Fellow / Lecturer

2011 – 2014

Queen's University, Kingston, Canada

- Processed, cleaned, and analyzed (MATLAB, Python) large datasets collected by a world-leading experiment to search for dark matter and other rare events.
- Fitted physical models to experimental data for event classification; applied regression and unconstrained nonlinear optimization. Utilized maximum likelihood analysis to test signal hypothesis against background model.
- Effectively communicated results at leading national/international conferences (see, e.g., a talk that I gave at 2013 Canadian Association of Physicists Congress: <http://tinyurl.com/oov4ha4>).
- Mentored several M.Sc. and undergraduate research students on data analysis including MATLAB programming and statistical techniques.

### Research Associate

2008 – 2010

University of Minnesota, Minneapolis, USA

Cryogenic Dark Matter Search experiment:

- Investigated neural network discrimination technique for signal/background separation. Used advanced statistical methods to perform high-dimensional data analysis.
- Developed software to optimize and automate techniques for setting event selection criteria that increased the expected signal sensitivity while minimizing backgrounds; applied constrained minimization using pattern search in MATLAB for numerical optimization.

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- Led a team to establish statistical criteria to identify and remove bad datasets due to periods of poor detector performance.
- Designed and programmed data analysis tools (MATLAB, MySQL, Excel) to estimate concentration of radioactive contaminations in samples; being used since 2010 to routinely analyze materials. Developed Monte Carlo simulations of the corresponding physical processes.
- Prepared results and published analysis papers in refereed scientific journals.

## Research Assistant

2004 – 2007

Illinois Institute of Technology, Chicago, USA

Particle physics experiments at Fermilab:

- Developed specialized algorithms (Fortran, C++) to reconstruct, observe, and measure properties of rare events from  $\sim$ TB datasets. Published results.
- Applied unbinned generalized likelihood fits to extract model parameters from low-statistics samples. Used Monte Carlo technique to estimate systematic errors and confidence intervals.
- Authored a computer program to readout low voltages (hundreds of channels) from the various crate power supplies and write them into SQL database.

## EDUCATION, CERTIFICATIONS

### Ph.D. in Physics

2007

Illinois Institute of Technology, Chicago, USA

Certificates in SQL, Relational Design Theory, UML  
Stanford online

## SELECTED REFEREED PUBLICATIONS

- R. Agnese *et al.* [SuperCDMS Collaboration], “Search for Low-Mass Weakly Interacting Massive Particles Using Voltage-Assisted Calorimetric Ionization Detection in the SuperCDMS Experiment,” *Phys. Rev. Lett.* **112**, 041302 (2014).
- R. Agnese *et al.* [CDMS Collaboration], “Silicon Detector Dark Matter Results from the Final Exposure of CDMS II,” *Phys. Rev. Lett.* **111**, 251301 (2013).
- Z. Ahmed *et al.* [CDMS collaboration], “Dark Matter Search Results from the CDMS II Experiment,” *Science* **327**, 1619 (2010).
- O. Kamaev *et al.* [HyperCP Collaboration], “Study of the Rare Hyperon Decay  $\Omega^\mp \rightarrow \Xi^\mp \pi^+ \pi^-$ ,” *Phys. Lett. B.* **693**, 236 (2010).

## ADDITIONAL INFORMATION

Permanent Resident of Canada.