

Anatoly Preygel

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Education

- 2007–2012 **Ph.D. Mathematics**, *Massachusetts Institute of Technology*.
Advisor: Jacob Lurie. Thesis: Thom-Sebastiani & duality for matrix factorizations.
- 2003–2007 **A.B. Mathematics**, *Harvard University*, Summa cum laude with highest honors, Φ BK.
- 1999–2003 **Math & Science Magnet**, *Montgomery Blair High School*, Highest GPA in class (tie).

Academic Honors & Awards

- 2012–2015 **NSF Mathematical Sciences Postdoctoral Fellowship**.
- 2009–2012 **NSF Graduate Research Fellowship**.
- 2004 **Putnam Math Competition, Honorable Mention, also top-100/-200 ('05/'06)**.
- 2003 **3rd Place and \$50,000 Scholarship, Intel Science Talent Search**.
- 2002 **USA Computing Olympiad All American Team, top 22 students nationally**.

Professional Experience

- Feb 2016 – present **CTO & Co-Founder**, *Pyxidr*, New York, Paris, Montreal.
Started and ran an “Advanced Analytics for Industrials” startup & consultancy. Personally coded analytics/data science products, including:
- In-house Monte Carlo simulation and visualization platform, including calibration of small library of (commodity) price processes;
 - Stochastic optimization-based algorithmic trading approach for day-ahead power at a major utility (put in production, with 5-10% lift over previous benchmark).
- 2014 – 2016 **Engagement Manager**, *McKinsey & Company*, New York, NY.
Served clients on topics across analytics, strategy, risk-management, and M&A. Strong focus on hard analytics, including personally developing:
- Monte Carlo capital model with an analytical approximation, for \$80B+ emerging-market debt and equity portfolio (distance-to-default model with lattice valuation, serially correlated risk-drivers with bespoke correlation structure; "large homogeneous portfolio" approximation);
 - “Principled” approach to including scenario analysis in Op Risk LDA model at a top-3 US bank (custom distributional form, refined single-loss-approximation);
 - Several other projects involving time-series analysis (e.g., driver-based forecasts) and predictive models (e.g., credit card customer behavior).
- 2014 **Faculty**, *The Data Incubator*, New York, NY.
Designed curriculum for and co-taught the 1st session of a "data science for PhDs" bootcamp.
- 2012 – 2014 **Postdoctoral Fellow**, *University of California Berkeley*, Berkeley, CA.
Conducted research in algebraic geometry, category theory, mathematical physics, and representation theory. Taught several advanced undergraduate courses.
- Summer 2012 **Summer Associate**, *McKinsey & Company*, New York, NY.
Built valuation model for a \$1T mortgage portfolio, and used to advise on strategic alternatives.
- Summer 2004 **Intern**, *Amaranth Advisors LLC*, Greenwich, CT.
Developed automated system for processing CDS price quotes in semi-structured text messages.
- Part-time 2001–2003 **Software Engineer Intern**, *Prime Task, Inc.*; *Booz Allen Hamilton*, McLean, VA.
Developed an expert system "grader" for a simulation-based rail operator training system.

Computing

Programming Languages Python, Javascript, C/C++, Julia, Java, Haskell, and others

Other shell scripting, Make, $\LaTeX 2\epsilon$, docker, SQL, Hadoop, Spark

Publications & Presentations

- Half dozen refereed papers or chapters published, with more submitted or in preprint form. Selected publications:
 - **J. European Math. Soc.** (to appear). *Integral transforms for coherent sheaves*, w/D. Ben-Zvi and D. Nadler.
 - **Compositio Math** (to appear). *A spectral incarnation of affine character sheaves*, w/D. Ben-Zvi and D. Nadler.
 - **Contemp. Math (chapter)** (2015, Stacks and Categories in Geometry, Topology, and Algebra). *Ind-coherent complexes on loop spaces and connections*.
 - *Preprint* (2014). *Mapping stacks and categorical notions of properness*, w/D. Halpern-Leistner, <https://arxiv.org/abs/1402.3204>.
 - *Preprint* (2011). *Thom-Sebastiani & Duality for Matrix Factorizations*, <https://arxiv.org/abs/1101.5834>
 - **Trans. Amer. Math. Soc.** (2009). *On measure-preserving C^1 transformations of compact-open subsets of non-archimedean local fields*, w/J. Kingsbery, A. Levin, and C. Silva.
- Numerous invited research talks. Dozens of seminar and workshop talks.