

# David Meretzky

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Notre Dame, Indiana USA 46556

## Areas of research

Model Theory, Differential Algebra, Galois Theory

## Education

**University of Notre Dame**

PhD candidate in Mathematics

Advisor: Professor Anand Pillay

South Bend, Indiana

Sept. 2019 – Present

**Macaulay Honors College at Hunter College, CUNY**

Combined BA/MA in Mathematics

Mentors: Professors John Loustau and Richard Churchill

New York City

Sept. 2013 – June 2018

GPA: 3.8

## Mathematical preprints

**Picard-Vessiot extensions, linear differential algebraic groups and their torsors**

David Meretzky, Anand Pillay.

arXiv:2307.14948

July 2023

**More on Galois cohomology, definability and differential algebraic groups**

Omar Leon Sanchez, David Meretzky, Anand Pillay.

arXiv:2105.13053

May 2021

## Teaching experience

**Adjunct Lecturer (Hunter College CUNY)**

Courses taught:

MATH 385: Numerical Methods I

MATH 155: Calculus with Analytic Geometry II

MATH 260: Linear Algebra

MATH 255: Vector Calculus

MATH 313: Theory of Numbers

September 2017 - June 2019

**Teaching Assistant/Lecturer (University of Notre Dame)**

Courses TAed:

MATH 10560: Calculus II

MATH 22580: Linear Algebra and Differential Equations

Courses taught:

MATH 10360: Calculus B

MATH 10130: Beginning Logic

Fall 2020 - Spring 2022

Spring 2022 - Fall 2023

## Talks

**Picard-Vessiot Extensions, Linear Differential Algebraic Groups and their Torsors**

Model Theory Workshop, University of Wrocław

**A boundedness condition for differential fields**

September 2023

	Waterloo Model Theory Seminar	March 2023
	McMaster Model Theory Seminar	March 2023
	<b>A boundedness theorem for differential Galois cohomology</b>	
	Kolchin Seminar in Differential Algebra	December 2022
	<b>Basics of definable Galois cohomology</b>	
	University of Notre Dame Logic Seminar	October 2022
	<b>New constants in differential Galois theory</b>	
	University of Illinois Chicago Logic Seminar	April 2022
	<b>A criterion for strong minimality from the geometric axioms for <math>DCF_0</math></b>	
	Notre Dame Mathematics Graduate Student Seminar	November 2020
Honors and scholarships	Landers/Hughes Prize (Hunter College CUNY)	2018
	Finalist CUNY Math Challenge (CUNY)	2016/2017
	Full Merit Scholarship for Undergrad. Study (Macaulay Honors College)	2013
Scientific research experience	<b>Systems Biology Center NY (Mount Sinai School of Medicine)</b>	
	Mentors: Dr. Ravi Iyengar, Dr. Jens Hansen	August 2015 – December 2018
	Applied graph theory to generate gene ontologies from mRNA microarray data	
	Programmed in R and Perl to clean and analyzed heart surgery patient data	
	<b>Department of Mathematics (Hunter College CUNY)</b>	
	Mentor: Professor John Loustau	January 2016 – May 2018
	Built an image processing pipeline for microscopy data of cells in Mathematica	
	Collaborated with biologists to build a mathematical model of cell motility	
Scientific publications	<b>Institution-specific machine learning models improve mortality risk prediction for cardiac surgery patients</b>	
	Journal of Thoracic and Cardiovascular Surgery, Volume 14.	June 2023
	<b>Novel Microscopy and Geometric Techniques for Visualizing Blebbing in Chemotacting Dictyostelium Cells</b>	
	PLOS ONE, <a href="https://doi.org/10.1371/journal.pone.0211975">https://doi.org/10.1371/journal.pone.0211975</a> .	February 2019
	<b>A Flexible Ontology for Inference of Emergent Whole Cell Function from Relationships Between Subcellular Processes</b>	
	Nature Scientific Reports, 7. 17689 (2017).	December 2017
Programming	Highly proficient in R and Mathematica. Familiarity with with C++, Python.	
Other interests	Film, Basketball, Literature	