

# William D. Simmons

## Curriculum Vitae

March 2021

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### EMPLOYMENT

2021-present Postdoctoral Fellow, Carnegie Mellon University  
2018-2020 Visiting Assistant Professor, Hobart and William Smith Colleges  
2014-2018 Hans Rademacher Instructor of Mathematics, University of Pennsylvania  
2013-2014 Assistant Adjunct Professor, University of California, Los Angeles

### EDUCATION

Ph.D. University of Illinois at Chicago, Mathematics, August 2013  
Advisor: David Marker  
Thesis: *Completeness of finite-rank differential varieties*  
M.S. Brigham Young University, Mathematics, August 2007  
Master's Project: *Super models: Several concepts and applications of model theory*  
B.S. Brigham Young University, Mathematics, August 2004

### RESEARCH INTERESTS

Formal methods for cyber-physical systems, model and proof theory, differential algebra

### PUBLICATIONS

1. (with Henry Towsner) Explicit polynomial bounds on prime ideals in polynomial rings over fields. *Pacific Journal of Mathematics*, 306(2): 721-754, 2020.
2. (with Henry Towsner) Proof mining and effective bounds in differential polynomial rings. *Advances in Mathematics*, 343: 567-623, 2019.
3. New examples (and counterexamples) of complete finite-rank differential varieties. *Communications in Algebra*, 45(7): 3137-3149, 2017.
4. (with James Freitag and Omar León Sánchez) On linear dependence over complete differential algebraic varieties. *Communications in Algebra*, 44(6): 2645-2669, 2016.
5. *Completeness of finite-rank differential varieties*. PhD thesis, University of Illinois at Chicago, 2013. [https://indigo.uic.edu/articles/thesis/Completeness\\_of\\_Finite-Rank\\_Differential\\_Varieties/10826813](https://indigo.uic.edu/articles/thesis/Completeness_of_Finite-Rank_Differential_Varieties/10826813).

### TALKS AND PRESENTATIONS

Math Club Presentation	Cal State San Bernardino	Jan. 21, 2020
Formal Methods in Math. (contrib. presentation)	Carnegie Mellon U.	Jan. 6-10, 2020
Logic Seminar	Cornell University	Dec. 3, 2019
New England Recursion and Definability Sem. (invited)	Bridgewater St. U.	Nov. 16, 2019
Mathematics Colloquium	Hobart and William Smith	April 30, 2018
Algebra, Combinatorics, and Geometry Seminar	U. of Pittsburgh	Nov. 9, 2017
AMS Sectional Meeting, Special Session (invited)	Hunter College	May 6-7, 2017
ASL 2017 Annual Meeting (contributed)	Boise State U.	Mar. 20-23, 2017
Logic Seminar	Ohio State University	Mar. 7, 2017
Logic & Computation Seminar	U. of Pennsylvania	Jan. 30, 2017

Algebra Seminar	U. of Pennsylvania	Nov. 21, 2016
Differential Algebra and Related Topics (poster)	CUNY	Oct. 1, 2016
Kolchin Seminar in Differential Algebra	Graduate Center, CUNY	Apr. 24, 2015
Logic & Computation Seminar	U. of Pennsylvania	Sept. 29 and Oct. 6, 2014
Logic Seminar	U. of California, Los Angeles	April 25, 2014
Mathematics Colloquium	Cal. State U., Dominguez Hills	Mar. 12, 2014
ASL Model Theory Special Session (invited)	U. of Waterloo	May 8-11, 2013
Grad. Student Colloquium	U. of Illinois at Chicago	Feb. 25, 2013
Joint Math. Meetings (contributed)	San Diego, CA	Jan. 9, 2013
Mathematics Colloquium	Brigham Young University	July 10, 2012
Model Theory Seminar	McMaster University	Mar. 27, 2012
Kolchin Seminar in Differential Algebra	Graduate Center, CUNY	Mar. 9, 2012
Logic Seminar	U. of Illinois at Chicago	Feb. 28, 2012
Logic Seminar	U. of Illinois at Chicago	May 4, 2010
Louise Hay Logic Seminar	U. of Illinois at Chicago	Apr. 22, 2010
Joint student logic seminar	U. of Chicago	Apr. 24, 2008

### SPECIAL PROGRAMS AND WORKSHOPS ATTENDED

DeepSpec Summer School on Verified Systems (Coq Intensive)	July 16-21, 2018	Princeton University
Workshop on Differential Galois Theory	July 24-28, 2017	Fields Institute
Thematic Program on Model Theory	June 13-17, 2016	U. of Notre Dame
Model Theory and Arithmetic Geometry	Feb. 3-7, 2014	MSRI
Model Theory of Fields	June 19-25, 2010	AMS Math. Rsch. Comm.
Model Theory	Aug. 9-14 2009	ESF Math. Conf.
Winter School in o-minimal Geometry	Jan. 12-16, 2009	Fields Institute
Proof Theory Workshop	June 6-17, 2005	U. of Notre Dame

### TEACHING

#### Department of Mathematics and Computer Science, Hobart and William Smith Colleges:

Instructor	Fall 2020	Calculus 1 (Math 130) (two sections, including lab)
Instructor	Spring 2020	Multivariable Calculus (Math 232)
Instructor	Spring 2020	Calculus II (Math 131) (including lab)
Instructor	Fall 2019	Calculus 1 (Math 130) (two sections, including lab)
Instructor	Spring 2019	Multivariable Calculus (Math 232)
Instructor	Spring 2019	Precalculus (Math 100) (including lab)
Instructor	Fall 2018	Calculus 1 (Math 130) (two sections, including lab)

#### Department of Mathematics, University of Pennsylvania:

Instructor	Spring 2018	Proving things: Algebra (Math 203, intro to proof)
Instructor	Spring 2018	Calculus II (Math 114)
Instructor	Fall 2017	Calculus III (Math 240)
Instructor	Spring 2017	Discrete Math II (Math 341, cryptography)
Instructor	Spring 2017	Linear Algebra (Math 312)
Instructor	Spring 2016, Fall 2016	Intro. to Calculus (Math 103)
Instructor	Spring 2016	Topics in Logic (Math 571, model theory of fields)
Instructor	Fall 2015	Algebra (Math 371, fields and Galois theory)
Instructor	Spring 2015	Algebra (Math 370, abstract algebra)
Instructor	Spring 2015	Intro. to Calculus (Math 103, active learning)
Instructor	Fall 2014	Intro. to Logic and Computability (Math 570)

**Department of Mathematics, University of California, Los Angeles:**

Instructor	Spring 2014	Optimization (Math 164)
Instructor	Spring 2014	Analysis (Math 131A)
Instructor	Winter 2014	Algebra (Math 110A, abstract algebra)
Instructor	Fall 2013, Winter 2014	Mathematical Modeling (Math 142)
Instructor	Fall 2013	Calculus of Several Variables (Math 32B)

**DISTINCTIONS AND SERVICE**

Calculus textbook committee (ad hoc), Department of Mathematics and Computer Science, Hobart and William Smith Colleges (starting Fall 2019)

Departmental Good Teaching Award (awarded Fall 2017 by the Department of Mathematics, University of Pennsylvania, for Math 312, taught in Spring 2017)

Referee for *Transactions of the AMS* (starting Oct. 2017)

Course Coordinator (supervising 3 sections of calculus), Department of Mathematics, University of Pennsylvania (Fall 2016)

Local organizer, Northeast Regional Model Theory Days, Oct. 22-23, 2016

AP/Transfer Credit Committee, Department of Mathematics, University of Pennsylvania (2015-2017)

Active Learning Committee, Department of Mathematics, University of Pennsylvania (2014-17)

Honorable Mention for performance as a teaching assistant, Spring 2009 (the Department of Mathematics, Statistics, and Computer Science, University of Illinois at Chicago, awards this designation to approximately 10% of teaching assistants each semester)

**LANGUAGE SKILLS**

Spanish: fluent in speaking and writing