

Gabriel Conant

Assistant Professor

University of Illinois at Chicago
Department of Mathematics, Statistics, and Computer Science

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Employment

2024-pres. Assistant Professor, **University of Illinois at Chicago**, Chicago, IL
2021-2024 Assistant Professor, **The Ohio State University**, Columbus, OH
2019-2021 Research Associate (postdoc), **University of Cambridge**, Cambridge, UK
2016-2019 Lumpkins Postdoctoral Fellow (RAP), **University of Notre Dame**, Notre Dame, IN
2015-2016 Visiting Assistant Professor, **University of Notre Dame**, Notre Dame, IN

Education

Aug. 2015 Ph.D. in Pure Mathematics, **University of Illinois at Chicago**, Chicago, IL
Advisor: David Marker
May 2010 MS in Pure Mathematics, **University of Illinois at Chicago**, Chicago, IL
May 2008 BA in Mathematics, **Colgate University**, Hamilton, NY

Grants and Awards

2024 **NSF Grant DMS-2348901**, July 15, 2024 to June 30, 2027
Title: *Structure and regularity in continuous model theory*
Amount: \$219,595
2019 **NSF Grant DMS-2204787** (moved from DMS-1855503), August 1, 2019 to December 31, 2023
Title: *Model theory and definable additive combinatorics*
Amount: \$119,074
2018 **AMS Simons Travel Grant**, University of Notre Dame
2014 **NSF Research Training Group Pre-doctoral Fellow**, University of Illinois at Chicago
RTG in algebraic geometry and related fields (number theory, complex dynamics, and model theory).
2008 **Edwin J. Downie '33 Award for Mathematics**, Colgate University
2006 **Sisson Prize in Mathematics**, Colgate University

Extended Research Programs

Fall 2021 **Fields Institute**, Toronto, Canada
Thematic Program on Trends in Pure and Applied Model Theory
Spring 2018 **Institute Henri Poincaré**, Paris, France
Model Theory, Combinatorics, and Valued Fields Trimester Program

Research Interests

Model theory and applications to **group theory** and **arithmetic combinatorics** (arithmetic regularity, approximate groups, and inverse problems for nonabelian groups)

Publications

1. G. Conant, E. Hrushovski, & A. Pillay, *Compactifications of pseudofinite and pseudo-amenable groups*, **Groups, Geometry, and Dynamics** (to appear), 23 pages.
2. G. Conant & A. Kruckman, *Three surprising instances of dividing*, **Journal of Symbolic Logic** (to appear), 18 pages.
3. G. Conant, C. d'Elbée, Y. Halevi, L. Jimenez, & S. Rideau-Kikuchi, *Enriching a predicate and tame expansions of the integers*, **Journal of Mathematical Logic** (to appear), 42 pages.

4. N. Chavarría, G. Conant, & A. Pillay, *Continuous stable regularity*, **Journal of the London Mathematical Society** 109 (2024), 36 pages.
5. G. Conant & A. Pillay, *Approximate subgroups with bounded VC-dimension*, **Mathematische Annalen** 388 (2024) 1001-1043.
6. G. Conant, K. Gannon, & J. Hanson, *Keisler measures in the wild*, **Model Theory** 2 (2023) 1-67.
7. G. Conant, A. Pillay, & C. Terry, *Structure and regularity for subsets of groups with finite VC-dimension*, **Journal of the European Mathematical Society** 24 (2022) 583-621.
8. G. Conant & J. Hanson, *Separation for isometric group actions and hyperimaginary independence*, **Fundamenta Mathematicae** 249 (2022) 97-109.
9. G. Conant, *Quantitative structure of stable sets in arbitrary finite groups*, **Proceedings of the American Mathematical Society** 149 (2021) 4015-4028.
10. G. Conant, *Stability in a group*, **Groups, Geometry, and Dynamics** 15 (2021) 1297-1330.
11. G. Conant & A. Pillay, *Pseudofinite groups and VC-dimension*, **Journal of Mathematical Logic** 21 (2021).
12. G. Conant & K. Gannon, *Associativity of the Morley product of invariant measures in NIP theories*, **Journal of Symbolic Logic** 86 (2021) 1293-1300.
13. G. Conant & K. Gannon, *Remarks on generic stability in independent theories*, **Annals of Pure and Applied Logic** 171 (2020).
14. G. Conant & M. C. Laskowski, *Weakly minimal groups with a new predicate*, **Journal of Mathematical Logic** 20 (2020).
15. G. Conant, *On finite sets of small tripling or small alternation in arbitrary groups*, **Combinatorics, Probability & Computing** 29 (2020) 807-829.
16. G. Conant, A. Pillay, & C. Terry, *A group version of stable regularity*, **Mathematical Proceedings of the Cambridge Philosophical Society** 168 (2020) 405-413.
17. G. Conant & A. Kruckman, *Independence in generic incidence structures*, **Journal of Symbolic Logic** 84 (2019) 750-780.
18. G. Conant, *Stability and sparsity in sets of natural numbers*, **Israel Journal of Mathematics** 230 (2019) 471-508.
19. U. Andrews, G. Conant, & I. Goldbring, *Definable sets containing productsets in expansions of groups*, **Journal of Group Theory** 22 (2019) 63-82.
20. G. Conant, *Extending partial isometries of generalized metric spaces*, **Fundamenta Mathematicae** 244 (2019) 1-16.
21. G. Conant, *Multiplicative structure in stable expansions of the group of integers*, **Illinois Journal of Mathematics** 62 (2019) 341-364.
22. E. Bering, G. Conant, & J. Gaster, *On the complexity of finite subgraphs of the curve graph*, **Osaka Journal of Mathematics** 55 (2018) 795-808.
23. G. Conant & A. Pillay, *Stable groups and expansions of $(\mathbb{Z}, +, 0)$* , **Fundamenta Mathematicae** 242 (2018) 267-279.
24. G. Conant, *There are no intermediate structures between the group of integers and Presburger arithmetic*, **Journal of Symbolic Logic** 83 (2018) 187-207.
25. G. Conant, *Forking and dividing in Henson graphs*, **Notre Dame Journal of Formal Logic** 58 (2017) 555-566.
26. G. Conant, *An axiomatic approach to free amalgamation*, **Journal of Symbolic Logic** 82 (2017) 648-671.
27. G. Conant, *Neostability in countable homogeneous metric spaces*, **Annals of Pure and Applied Logic** 168 (2017) 1442-1471.
28. G. Conant, *Distance structures for generalized metric spaces*, **Annals of Pure and Applied Logic** 168 (2017) 622-650.
29. G. Conant, *A remark on strict independence relations*, **Archive for Mathematical Logic** 55 (2016) 535-544.
30. G. Conant & C. Terry, *Model theoretic properties of the Urysohn sphere*, **Annals of Pure and Applied Logic** 167 (2016) 49-72.

Preprints

1. G. Conant & A. Pillay, *An analytic version of stable arithmetic regularity*, **arXiv 2401.14363**, 28 pages.
2. G. Conant & C. Terry, *Pseudofinite proofs of the stable graph regularity lemma*, **arXiv 2308.16809**, 15 pages.

3. G. Conant, K. Gannon, & J. Hanson, *Generic stability, randomizations, and NIP formulas*, **arXiv 2308.01801**, 38 pages.
4. A. Abd Aldaim, G. Conant, & C. Terry, *Higher arity stability and the functional order property*, **arXiv 2305.13111**, 71 pages.

Invited Talks

- 2024 *Beijing Model Theory Conference*, Chinese Academy of Sciences
- 2024 *Special Session on Model Theory*, ASL North American Annual Meeting
- 2024 *Special Session on Model Theory*, AMS Spring Central Sectional Meeting
- 2024 *Department Colloquium*, University of Illinois at Chicago
- 2024 *Department Colloquium*, University of Illinois at Urbana-Champaign
- 2024 *Géométrie et Théorie des Modèles*, Ecole Normale Supérieure
- 2023 *Mid-Atlantic Mathematical Logic Seminar*, Rutgers University
- 2023 *Neostability Workshop*, Banff International Research Station
- 2022 *Midwest Model Theory*, University of Illinois at Chicago
- 2022 *ASL Special Session on Model-theoretic Classification Program*, 2022 Joint Mathematics Meetings
- 2022 *Special Session on Model Theory and its Applications*, AMS Spring Central Sectional Meeting
- 2021 *Workshop on Model Theory and Combinatorics*, Fields Institute
- 2021 *Workshop on Trends in Pure and Applied Model Theory*, Fields Institute
- 2021 *Department Colloquium*, The Ohio State University
- 2021 *Canadian Discrete and Algorithmic Mathematics*
- 2021 *Géométrie et Théorie des Modèles*, Ecole Normale Supérieure
- 2021 *ASL Winter Meeting at JMM*, Invited Address
- 2020 *Groups and Model Theory* (cancelled), Stevens Institute of Technology
- 2020 *Antalya Algebra Days XXII* (cancelled), Nesin Mathematics Village
- 2020 *Model Theory: Groups, Geometries, and Combinatorics*, Mathematical Research Institute of Oberwolfach
- 2019 *Workshop on Recent Applications of Model Theory*, Fields Institute
- 2019 *Model Theory and Mathematical Logic*, University of Maryland
- 2019 *Journées sur les Arithmétiques Faibles*, CUNY Graduate Center
- 2019 *Pure Mathematics Conference*, Southern Illinois University
- 2019 *Department Colloquium*, Vassar College
- 2019 *Department Colloquium*, Wesleyan University
- 2019 *Department Colloquium*, Iowa State University
- 2018 *Pure and Applied Model Theory*, University of Illinois
- 2018 *Neostability Workshop*, International Research Station, Casa Matemática Oaxaca
- 2018 *Special Session on Model Theory*, ASL European Logic Colloquium, University of Udine
- 2018 *Ramsey Theory in Logic, Combinatorics, and Complexity*, Università di Bologna, Bertinoro
- 2018 *South and East of England Model Theory Network*, University of Norwich
- 2018 *Department Colloquium*, The Hebrew University of Jerusalem
- 2018 *Combinatorics and Additive Number Theory*, CUNY Graduate Center
- 2018 *Special Session on Model Theory*, ASL North American Annual Meeting, Western Illinois University
- 2018 *Model Theory of Finite and Pseudofinite Structures*, University of Leeds
- 2018 *Model Theory and Combinatorics*, Institut Henri Poincaré
- 2017 *Special Session on Model Theory*, CMS Annual Winter Meeting, University of Waterloo
- 2017 *Nonstandard Methods in Combinatorial Number Theory*, American Institute of Mathematics
- 2017 *Model Theory in Wrocław*, Instytut Matematyczny, Uniwersytet Wrocławski
- 2016 *Model Theory of Finite and Pseudofinite Structures*, University of Leeds
- 2016 *Graduate Student Conference in Logic* (faculty plenary speaker), University of Notre Dame
- 2016 *Midwest Model Theory Day*, University of Illinois at Chicago
- 2015 *Homogeneous Structures Workshop*, Banff International Research Station
- 2015 *Special Session on Model Theory*, AMS Central Fall Sectional Meeting, Loyola University Chicago
- 2015 *Neostability Workshop*, International Research Station, Casa Matemática Oaxaca
- 2015 *BLAST*, University of North Texas

Instructional Talks and Mini-Schools

- Fall 2020 Lecturer and online instructor for “An Excursion Into Model Theory and Its Applications”
London Mathematical Society Online Lecture Series
- June 2016 Thematic Program in Model Theory (6 hours of lectures)
Undergraduate Summer School at the University of Notre Dame

Organizational Roles

Conferences and Workshops

- 2023 Geometric and Combinatorial Configurations in Model Theory (scientific committee)
University of Freiburg
- 2022 Combinatorics Meets Model Theory (organizer)
University of Cambridge
- 2019 AMS Special Session on Recent Advances in Regularity Lemmas (organizer)
Joint Mathematics Meetings
- 2017 Special Session in Model Theory (organizer)
AMS Spring Central Sectional Meetings
- 2016 16th Graduate Student Conference in Logic (organizer)
University of Illinois at Chicago

Seminars

- 2023-pres. Logic Seminar (organizer), The Ohio State University
- 2013 Graduate Student Colloquium (organizer), University of Illinois at Chicago
- 2011-2013 Louise Hay Logic Seminar (organizer) University of Illinois at Chicago

Postdocs and Students

Postdocs	Leo Jimenez	The Ohio State University	2023-present
PhD students	Al Baraa Abd Aldaim	The Ohio State University	2023-present
	Devrim Pekmezci	University of Illinois at Chicago	2023-present
Masters students	Louis Xiang Li	The Ohio State University	2023-present

Advising

Academic advisees	Tyler Beauregard	The Ohio State University	2023-present
	Gradmar Maldonado	The Ohio State University	2023-present
	Devrim Pekmezci	The Ohio State University	2022-2023
First-year mentees	Ali Farsad	The Ohio State University	Spring 2024
	Chavdar Lalov	The Ohio State University	2023-2024
	Hugh Dennin	The Ohio State University	2022-2023

Undergraduate Research

- Summer 2023 OSU ROMUS (Research Opportunities in Mathematics for Underrepresented Students)
Tora Ozawa & David Zeng (undergraduate), Aycin Iplikci Arodirik (graduate assistant)
- Summer 2024 OSU ROMUS (Research Opportunities in Mathematics for Underrepresented Students)
Jad Damaj & Teresa Pollard (undergraduate), Hannah Sheats (graduate assistant)

Other Service

Departmental Committees

- 2023-2024 Graduate Studies Committee, Mentoring Committee
- 2022-2023 Mentoring Committee

PhD Defense Committees

2016 Somayeh Vojdani (advisor: Anand Pillay), University of Notre Dame

PhD Candidacy Committees

2024 Yewen Sun (advisor: Caroline Terry), The Ohio State University

2023 Juan Pablo De Rasis (advisor: Jennifer Park), The Ohio State University

2019 Nicolas Chavarria (advisor: Anand Pillay), University of Notre Dame

Panels

June 2021 Non-research aspects of job/grant applications and in careers in mathematics
ASL Annual Meeting, University of Notre Dame

Miscellaneous

2016-pres. AMS MathSciNet Reviewer

2013-pres. Creator and webmaster of **forkinganddividing.com** (an online resource for education and research in model theory)

Teaching Experience

2021-2024. **Assistant Professor, The Ohio State University**

MATH 6004 Model Theory: Spring 2024 (9 students)

MATH 6003 Set Theory: Spring 2023 (6 students)

MATH 8000 Topics in Model Theory: Fall 2022 (7 students)

MATH 3345 Foundations of Higher Mathematics:

Spring 2022 (31 students, 33 students), Spring 2024 (30 students)

2019-2021 **Research Associate, University of Cambridge**

Model Theory (Part III, examinable): Michaelmas Term 2020

Applications of Pseudofinite Model Theory (graduate, non-examinable): Easter Term 2020

2015-2019 **Research Associate Professor, University of Notre Dame**

MATH 40910 Topics in Mathematical Logic: Spring 2019 (10 students)

MATH 20550 Calculus III: Fall 2015 (36 students), Fall 2016 (66 students), Fall 2017 (64 students)

MATH 10560 Calculus II: Fall 2015 (57 students), Spring 2016 (65 students)

MATH 10250 Elements of Calculus I: Spring 2016 (29 students), Fall 2017 (69 students)

MATH 10360 Calculus B for the Life and Social Sciences: Fall 2018 (43 students)

MATH 10130 Beginning Logic: Fall 2016 (33 students)

MATH 10120 Finite Mathematics: Spring 2017 (27 students)

2012-2015 **Lecturer (graduate student), University of Illinois**

MATH 300 Writing for Mathematics: Fall 2013, Spring 2014

MATH 210 Calculus 3: Fall 2012

Summer Enrichment Workshop - Math 090 Intermediate Algebra: Summer 2013

2008-2013 **Teaching assistant (graduate student), University of Illinois**

MATH 181 Calculus 2, MATH 180 Calculus 1, MATH 160 Finite Math for Business,

MATH 121 Precalculus, MATH 090 Intermediate Algebra