

Thomas Daniells Gilton

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Research interests

Mathematical Logic and Set Theory, in particular:

- consequences of forcing axioms, particularly Open Coloring Axioms;
- compactness/incompactness tension;
- combinatorics arising from set-theoretic topology, especially the Tukey order

Employment

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| Spring 2020 – Present | Visiting Assistant Professor, Mathematics Department, University of Pittsburgh |
| 2014 – 2019 | Teaching/Research Assistant, University of California, Los Angeles |

Education

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| December 2019 | University of California, Los Angeles – Los Angeles, CA
PhD in Mathematics
Advisor: Itay Neeman
Thesis: On the Infinitary Combinatorics of Small Cardinals and the Cardinality of the Continuum |
| May 2014 | University of North Texas – Denton, Texas
MS in Mathematics
Advisor: John Krueger
Thesis: $I[\omega_2]$ and Adequate Set Forcing |
| May 2012 | University of North Texas – Denton, Texas
BS in Mathematics
Summa Cum Laude |
| May 2012 | University of North Texas – Denton, Texas
BA in Physics
Summa Cum Laude |

Papers

Published:

- [1] **Club Stationary Reflection and the Special Aronszajn Tree Property**
(with Omer Ben-Neria)
Canadian Journal of Mathematics.
- [2] **Trees and Stationary Reflection at Double Successors of Regular Cardinals**
(with Maxwell Levine and Šarka Stejskalová)
Journal of Symbolic Logic,
- [3] **Abraham-Rubin-Shelah Open Colorings and a Large Continuum**
(with Itay Neeman)
Journal of Mathematical Logic
- [4] **A Note on the Eightfold Way**
(with John Krueger)
Proceedings of the American Mathematical Society 148 (2020), no. 3, 1283-1293.
- [5] **The Harrington-Shelah Model with Large Continuum**
(with John Krueger)
Journal of Symbolic Logic, 84 (2019), no. 2, pp 684-703.
- [6] **Mitchell's Theorem Revisited**
(with John Krueger)
Annals of Pure and Applied Logic, Volume 168 (2017), no. 5, pp 922-1016.

Submitted:

- [7] *Compactness Principles at $\aleph_{\omega+2}$* (with Šarka Stejskalová)
- [8] *PCF Theory and the Tukey Spectrum*

Works In Progress:

- [9] *The Abraham-Rubin-Shelah Open Coloring Axiom with a Continuum below \aleph_ω*
- [10] *EBFs, Club Stationary Reflection, and the Tree Property*

Book Chapters:

- [11] **Side Conditions and Iteration Theorems**
(with Itay Neeman)
From the 2016 Appalachian Set Theory meeting. To appear in next AST volume.

Conference Talks

- May 29-June 03, 2023 Title TBD
Young Set Theory Workshop, Münster, Germany
Invited, 75 minute talk
- March 25-29, 2023 PCF Theory and the Tukey Spectrum
2023 ASL Special Session in Set Theory, Irvine, California
Invited
- September 3, 2022 *PCF Theory and the Tukey Spectrum*
New Directions in Set-Theoretic Topology Workshop (co-organized by myself and Paul Gartside)
- June 27-July 1, 2022 *Club Stationary Reflection and Consequences of Square Principles*
Reykjavik Logic Colloquium, Special Session on Set Theory (via Zoom).
Invited
- April 7-10, 2022 *Club Stationary Reflection and the Special Aronszajn Tree Property*
North American Annual Meeting of the Association for Symbolic Logic.
- March 11-13, 2022 *ARS Open Colorings and Larger Values of the Continuum*
AMS Sectional Meeting in Set Theory on “Forcing and Large Cardinals”.
Invited (Cancelled due to Covid-related concerns)
- Jan. 5-8, 2022 *Club Stationary Reflection and the Special Aronszajn Tree Property*
ASL special session at Joint JMM meeting
(Cancelled due to Covid-related concerns.)
- June 19, 2021 *Club Stationary Reflection and the Special Aronszajn Tree Property*
Boise Extravaganza in Set Theory (via Zoom)
- June 10, 2021 *Club Stationary Reflection and the Special Aronszajn Tree Property*
BLAST 2021 (via Zoom)
- March, 2020 *Abraham-Rubin-Shelah Open Colorings and a Large Continuum*
Special session on “Forcing and Ramsey Theory” at the 2020 North American Annual meeting of the ASL.
Invited. (Cancelled due to COVID-19)
- April 13, 2019 *Abraham-Rubin-Shelah Open Colorings and a Large Continuum*
Annual Graduate Student in Logic Conference (University of Illinois, Chicago)

Talks at Seminars

- September 23, 2022 *PCF Theory and the Tukey Spectrum*
Carolinas Topology Seminar (Invited)
- Nov 29, 2021 *What are Gödel’s Incompleteness Theorems?*
U. Pitt Undergraduate Math Seminar
- Nov 12, 2021 *Davies Trees*
U. Pitt Topology Seminar

- Oct 26, 2021 *Compactness/Reflection and Rigidity in Set Theory*
Logic seminar, University of Illinois at Chicago (Invited)
- Sept. 28, 2021 *The tension between reflection/compactness and rigidity in combinatorial set theory*
2 talks: CMU seminars in Logic and in Set Theory
- Sept 24, 2021 *The ABCs of PCF, with applications to Dowker spaces (pt. 2)*
U. Pitt Topology Seminar
- Sept 10, 2021 *The ABCs of PCF, with applications to Dowker spaces (pt. 1)*
U. Pitt Topology Seminar
- April 8, 2021 *Games You'd Play at an Infinitely Large Birthday Party (or: How I Learned to Love Infinitary Combinatorics)*
U. Pitt Undergraduate Math Seminar
- Jan 20, 2021 *Open Coloring Axioms and the value of the Continuum*
U. Pitt Topology Seminar
- Nov. 5, 2020 *The Bizarre World of Infinities*
U. Pitt Undergraduate Math Seminar
- Nov 4, 2020 *Applications of Set Theory to Topology: Elementary Submodels (pt. 2)*
U. Pitt Topology Seminar
- Oct 28, 2020 *Applications of Set Theory to Topology: Elementary Submodels (pt. 1)*
U. Pitt Topology Seminar
- Dec 4, 2020 *The ARS Open Coloring Axiom with Large Continuum*
Fields Institute Set Theory Seminar (2 hr talk)
- Sept. 17, 2019 *The ARS Open Coloring Axiom with Large Continuum*
CMU Logic Seminar
- May 1, 2019 *The ARS Open Coloring Axiom with Large Continuum*
Hebrew University of Jerusalem, Logic Seminar
- Feb. 22, 2019 *The ARS Open Coloring Axiom with Large Continuum*
Cabal Seminar (UCLA)
- June 7, 2017 *A Generalization of the Semi-Open Coloring Axiom to \aleph_2*
UCLA Graduate Logic Seminar
- Oct 17, 2016 *A Generalization of Martin's Axiom*
UCLA Graduate Logic Seminar
- Feb 24, 2016 *The Failure of GCH at a Measurable from the Optimal Hypotheses*
UCLA Graduate Logic Seminar
- Fall 2014 *Mitchell's Theorem Revisited*
UCLA Graduate Logic Seminar (three talks)
- 2013-2014 8 talks at the UNT "Graduate Logic Group" on various topics in set theory

Honors and Awards

- July-Dec. 2019 Dissertation Year Fellowship (UCLA)
Fellowship awarded for three academic quarters; accepted funding from two due to early graduation date.
- Spring 2018 Mathematics Departmental Teaching Award (UCLA)
- Spring 2012 Outstanding Physics Senior (UNT)
- 2009-2012 University of North Texas Multicultural Scholarship (UNT)
Financial award given to students for promoting cultural diversity.
- Spring 2011 Outstanding Undergraduate Student in Mathematics Award (UNT)
- Spring 2011 L.F. Connell Award in Physics (UNT)
Given to outstanding junior physics major.

Teaching

As Visiting Assistant Professor at U. Pitt

- Math 0120 Business Calculus (Spring 2021)
- Math 0220 Analytic Geometry and Calculus 1 (Fall 2020, twice in Fall 2021)
- Math 0230 Analytic Geometry and Calculus 2 (Spring 2021)
- Math 0240 Analytic Geometry and Calculus 3 (Spring 2022)
- Math 0413 Introduction to Theoretical Mathematics (Once in Spring 2022, Twice in Spring 2020, once in Fall 2020)
- Math 1180 Theoretical Linear Algebra (Spring 2023)
- Math 1290 Topics in Geometry (Spring 2023)
- Math 1410 Introduction to the Foundations of Mathematics (Fall 2022)

As a Teaching Assistant Consultant at UCLA

- Math 495 Teaching College Mathematics (Fall 2018)
One of two mathematics graduate students selected due to excellence in teaching to instruct the incoming class of mathematics graduate students on how to teach mathematics discussion sections.

As an Instructor at the University of North Texas

- MATH 1190 Business Calculus, (Fall 2013, Spring 2014)
- MATH 2700 Linear Algebra (Summer 2014)

As a Teaching Assistant at UCLA

- PHIL 135 Modal Logic (cross undergraduate/graduate, Spring 2017)
- MATH 3C Probability (Winter 2015)

MATH 31A	Differential Calculus (Fall 2015)
MATH 31AL	Differential Calculus with Learning Assistants (Fall 2017)
MATH 31B	Integral Calculus (Fall 2015, Winter 2015)
MATH 32A	Multivariate Differential Calculus (Spring 2016)
MATH 32B	Multivariate Integral Calculus (Spring 2016, Fall 2016)
MATH 33B	Ordinary Differential Equations (Winter 2016)
MATH 61	Discrete Math (Fall 2016, Winter 2016)
MATH 115A	Advanced Linear Algebra (Spring 2017)
MATH 120	Topology (Spring 2018)
MATH 131A	Analysis I (Spring 2017, Summer 2018)
MATH 131AH	Honors Analysis I (Winter 2019)
MATH 131B	Analysis II (Winter 2017)
MATH 170B	Advanced Probability (Summer 2017)

Undergraduate and Graduate Mentoring

As a Visiting Assistant Professor at U. Pitt

(Reverse chronological order)

- (*) *Daniel Maienshein*, U. Pitt 2nd-year graduate student (as of Fall 2022)
Reading course in Fall 2022. Our topic was the set-theoretic combinatorics relevant for set-theoretic topology (ex: cofinality and cardinality; filters and ultrafilters; club and stationary sets; Ramsey theory; cardinal characteristics of the continuum).
- (*) *Adam Hicks* (undergraduate math major), Spring 2022-Summer 2022
A reading course in Spring 2022; the topic was an introduction to first-order logic. Additionally, **Adam was awarded a 2000 dollar** fellowship from the Pitt Math Department to do reading and research under my supervision during the Summer of 2022.
- (*) *Eric Chen*, undergraduate math major (Spring 2022)
Reading course in Spring 2022. Our topic was an introduction to first-order logic.
- (*) *Stephen MacKereth*, U. Pitt Philosophy Graduate Student (Summer 2021)
We met biweekly over Summer 2021. I helped Stephen to learn the method of forcing from the ground up; we ended with the consistency of $\neg\text{CH}$.

- (*) *Gabriel Weiner*, U. Pitt Math Undergraduate (Spring 2020-Summer 2021)
Met biweekly through the beginning of Spring 2020 to the end of Summer 2021. **Gabriel began graduate work in math at Auburn University in Fall 2021.** We began with Descriptive Set Theory, and then we transitioned into combinatorial set theory, focusing on Shelah's PCF theory. We also discussed the Tukey order. **Gabriel was awarded a 2000 dollar Painter fellowship** through the Pitt Math Department to work under my supervision during the Summer of 2021.

As a Graduate Student at UCLA

- (*) *Vincent Robbins*, math undergraduate (Fall 2018-Winter 2019)
Part of a **Directed Reading Program**. We focused on descriptive set theory and on how to give mathematics talks.
- (*) *Karina Sanchez*, math undergraduate (Summer 2018)
Part of a **Directed Reading Program**. We focused on an introduction to mathematical logic and on how to give mathematics talks.

Organization and Program Committees

- (†) U. Pitt Mathematics Research Center Mini-Conference in Summer of 2023,
with Paul Gartside (U. Pitt), on set-theoretic topology. *Full funding for budget (including speaker travel) obtained through U. Pitt Math Dept.*
- (†) A workshop on *New Directions in Set-Theoretic Topology*, Fall 2022.
I co-organized the workshop with Paul Gartside (U. Pitt). We brought five additional mathematicians together to discuss open problems and new techniques in the field. *Full funding for budget (including speaker travel) obtained through U. Pitt Math Dept.*

Other Service

- (★) Invited by a Calculus 1 student of mine on behalf of the National Society for Black Engineers to lead a review session for Calculus 1. Took place from 6:30pm to 8:30pm on Wednesday, December 8th, 2021.
- (★) Referee for *Combinatorica*, *The Journal of Mathematical Logic*, and *Annals of Pure and Applied Logic*.
- (★) Founder of the Mathematics and Logic in German group at U. Pitt. We are reading Ralf Schindler's *Logische Grundlagen der Mathematik*, as well as Frege's *Die Grundlagen der Arithmetik*. So far our members include mathematics undergraduates, philosophy graduates, multiple math professors, and a postdoctoral researcher in the history and philosophy of science.
- (★) TA Training in Assessment and Grading
Selected by Office of Instructional Development at UCLA due to excellence serving as a Teaching Assistant. Led two sessions at the UCLA TA conference (Sept. 24-25, 2018) on Teaching and Grading Problem Solving in Math.

- (★) Co-Founder (with Jared Holshouser) of the Graduate Logic Group at University of North Texas in Summer 2012.
The group met actively until the Spring of 2020 (due to Covid).

References

- (*) Omer Ben-Neria
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- (*) James Cummings
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- (*) Paul Gartside
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- (*) John Krueger
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- (*) Itay Neeman
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ineeman@math.ucla.edu
- (*) Evgeni Trofimov
Lecturer in Mathematics
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Teaching Reference