# Nir Gadish

## Personal Data


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| Current position: | NSF Postdoctoral Associate, at The University of Michigan |
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## Positions Held

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| 2021-Present | NSF Postdoctoral associate, **The University of Michigan** |
| 2020-2021 | NSF Postdoctoral associate, **MIT** |
| 2019-2020 | NSF Postdoctoral fellow, **MIT** |

## Education

2013 - 2019 | **The University of Chicago**, department of Mathematics
Ph.D. received June 2019, M.S. received June 2015.
Dissertation: "A general framework for representation stability, with applications to arrangements and arithmetic".
Thesis Advisor: Prof. Benson Farb

2008-2012 | **Hebrew University of Jerusalem**
B.Sc in Mathematics, Physics and Amirim special honors program.
Summa cum Laude - Final grade: 98.00%
Honors Thesis: "Free differential graded Lie-algebra model of the 2-cell".
Honors Thesis Advisor: Prof. Ruth Lawrence

## Preprints and Publications

2021 Homology representations of compactified configurations on graphs applied to $M_{2,n}$ (with C. Bibby, M. Chan and C. Yun), *arXiv:2109.03302* (submitted).

2021 Product Expansions of q-Character Polynomials (with A. Balachandran, A. Huang and S. Sun), *arXiv:2106.11587* (submitted).

2020 Correction to the article A spectral sequence for stratified spaces and configuration spaces of points (with D. Petersen), *G&T* Vol. 25(5) (2021): 2699-2706.

2020 Deletion and contraction in configuration spaces of graphs (with S. Agarwal, M. Banks and D. Miyata), *arXiv:2005.13666* (to appear in AGT).

2019 A generating function approach to new representation stability phenomena in orbit configuration spaces (with C. Bibby), *arXiv:1911.02125* (submitted).

2018 Adding points to configurations in closed balls (with L. Chen and J. Lanier), *Proc. of the AMS* (2019).

2018 Combinatorics of orbit configuration spaces (with C. Bibby), *Int. Math. Res. Not.*, DOI:rnaa296 (2020).

2018 Dimension-independent statistics of $Gl_n(F_q)$ via character polynomials, *Proc. of the AMS* (2019).

2017 An explicit symmetric DGLA model of a bi-gon (with I. Griniasty and R. Lawrence), *J. of Knot Theory and its Ramifications*, Vol. 28 (2019).

2017 A trace formula for the distribution of rational $G$-orbits in ramified covers, adapted to rep. stability, *NY J. of Math*, Vol. 23 (2017): 987-1011.

2016 Categories of FI type: a unified approach to generalizing representation stability and character polynomials, *J. of Algebra*, Vol. 480 (2017): 450-486.

2016 Representation stability for families of linear subspace arrangements, *Adv. in Math*, Vol. 332 (2017): 341-377.

## Honors and Awards

2019-2021 NSF Mathematical Sciences Postdoctoral Research Fellowship, (MIT).
2013-2015 McCormick Fellowship, (University of Chicago).
2012 The Dean's Prize for Master students, (Hebrew University of Jerusalem).
2009-2011 "Amirim" special honors program, (Hebrew University of Jerusalem).
2011 Dean's List, (Hebrew University of Jerusalem).
2010 The Rector's Prize, (Hebrew University of Jerusalem).
2009 The Rector's Prize, (Hebrew University of Jerusalem).

## Invited Talks and Presentation

Oct 2021 Configuration spaces of graphs applied to cohomology of $M_{2,n}$, *Compactification, Configurations and Cohomology*, (Northeastern U.)
May 2021 Möbius inversion in hömotopy theory, *Arrangements at Home*, (Western Ontario) [virtual]
Apr 2021 Möbius inversion in hömotopy theory, *Topology seminar*, (U. of Haifa) [virtual]
Apr 2021 Möbius inversion in hömotopy theory, *AlgeCom XXI*, (U. of Notre Dame) [virtual]
Apr 2021 Möbius inversion in hömotopy theory, *Topology seminar*, (MIT) [virtual]
Oct 2020 Combinatorics of orbit configuration spaces, *Topology seminar*, (U. of Rochester) [virtual]
Apr 2020 The "generating function" of configuration spaces, *Topology seminar*, (Purdue U.) [virtual]
Mar 2020 The "generating function" of configuration spaces, *Combinatorics seminar*, (Brown U.) [virtual]
Jan 2020 Finitely generated diagrams of linear subspace arrangements, *Workshop on Polyhedral Products in Homotopy Theory*, (The Fields Institute)
Nov 2019 Finitely generated diagrams of linear subspace arrangements, *Topology seminar*, (MIT)
Sep 2019 The "generating function" of configuration spaces, *Topology seminar*, (Georgia Tech.)
Sep 2019 The "generating function" of configuration spaces, *Topology seminar*, (Northeastern U.)
Jul 2019 From the topology of the space of polynomials to insolvability, *GA-Tech REU*, (Georgia Tech.)
Jun 2019 The "generating function" of configuration spaces, *Arrangements at Western*, (Western Ontario)
Apr 2019 The "generating function" of configuration spaces, *Midwest rep. stability workshop*, (Chicago)
Apr 2019 The "generating function" of configuration spaces, *Topology meeting*, (Stockholm U. and KTH)
Feb 2019 Combinatorics of orbit configuration spaces, *Topology RTG seminar*, (U. of Michigan)
Jan 2019 Finitely generated families of arrangements, *Topology seminar*, (U. of Copenhagen)
Oct 2018 Finitely generated families of arrangements, *Topology seminar*, (U. of Minnesota)
Sep 2018 Combinatorics of representation stability, *Combinatorics preseminar*, (MIT)
Sep 2018 Finitely generated families of arrangements, *GASC seminar*, (Northeastern University)
Sep 2018 Stable character theory, *Algebra seminar*, (Weizmann Institute)
Aug 2018 Stable character theory, *Algebra seminar*, (Bar Ilan U.)
June 2018 Finitely generated families of arrangements, *Roots of Topology*, (U. of Chicago)
May 2018 Finitely generated families of arrangements, *Topology seminar*, (U. de Strasbourg)
May 2018 Finitely generated families of arrangements, *Topology seminar*, (U. de Montpellier)
Mar 2018 Finitely generated families of arrangements, *Topology seminar*, (U. de Rennes 1)
Mar 2018 Finitely generated families of arrangements, *Algebra seminar*, (UC Irvine)
Mar 2018 Finitely generated families of arrangements, *Representation stability seminar*, (U. of Michigan)
Oct 2017 Finitely generated families of arrangements, *No Boundaries: Farbfest*, (U. of Chicago)
Sep 2017 Lifting finite generation to the space level, *Topology seminar*, (Purdue U.)
Jul 2017 Finitely generated families of arrangements, *Math. Congress of the Americas*, (McGill University)
Jul 2017 Stability patterns in representation theory, *'Amitsur' algebra seminar*, (Hebrew U. of Jerusalem)
Jun 2017 Stability patterns in representation theory, (Tel Aviv University)
Apr 2017 Categories of FI-type: generalizing rep. stability, *AMS sectional meeting*, (University of Indiana)
Sep 2016 Rep. stability of families of linear subspace arrangements, *AMS sec. meeting*, (Bowdoin College)

## Teaching Experience

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| 2021-Present | **The University of Michigan** |
| 2021-Present | Instructor for IBL Calculus I (Math 115). |
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| 2019-2021 | **Massachusetts Institute of Technology** |
| 2019-2021 | Recitation instructor for Linear Algebra (Math 18.06). |
| | Lead for Communications-Intensive(CI) Discrete math (Math 18.204). |
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| 2014-2019 | **The University of Chicago** |
| 2018-2019 | Instructor for Calculus III (Math 153), |
| | Instructor for Calculus II (Math 152), |
| 2017-2018 | Instructor for Calculus II (Math 152), |
| | Teaching assistant for *UChicago study abroad program in Paris*. |
| 2016-2017 | Instructor for Math. methods in the Social Sciences (Math 195), |
| | (IBL) Coinstructor for Basic Geometry (Math 176), |
| | Instructor for Calculus III (Math 153). |
| 2015-2016 | Instructor for Linear Algebra (Math 196), |
| | Instructor for Calculus II (Math 152), |
| | Instructor for Calculus I (Math 151). |
| 2014-2015 | TA for Intro. to Algebraic Topology (Math 263), |
| | TA for Point-Set Topology (Math 262), |
| | TA for Intro. to Representation Theory of finite groups (Math 267). |
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| 2010-2012 | **Hebrew University of Jerusalem** |
| 2011-2012 | Junior Instructor for Applied Mathematics I and II (Math 114, 157), |
| 2010-2011 | TA for Complex Valued Functions and Applications (Math 314). |

## Professional Services

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| | Referee for *NY J. of Math.*. |
| | Referee for *IMRN*. |
| | Referee for *Geom. and Top.*. |
| | Referee for *Proc. of the AMS*. |
| | Referee for *Transactions of the AMS*. |
| | Referee for *J. of Algebraic Combinatorics*. |
| 2015-2016 | Co-organizer of the weekly Geom-Top student seminar, (University of Chicago). |
| 2014-2015 | Co-organizer of the weekly graduate "Pizza" student seminar, (University of Chicago). |

## Community Outreach

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| Fall 2021 | Mentor at *Math Corps at U(M) Super Saturday* – math education for middle school students from underserved communities in the Detroid metropolitan area. |
| Fall 2021 | Instructor at *U(M) Math Circles* – recreational math activities for high school students. |
| 2020 | Mentor at *MIT PRIMES USA* – advanced math research projects for high school students. |
| Apr 2016 | Judge at *QED: Chicago's Young Math Symposium*. |
| Jul 2015 | Mentor for the UChicago summer REU projects – in the special program for underrepresented groups. |

## Student Advising and Mentoring

2020-2021 Mentor for 'MIT PRIMES USA', (MIT):
"Product Expansions of q-Character Polynomials", A. Balachandran, A. Huang, and S. Sun;

2019-2020 Mentor in the '1st Generation Program', (MIT);

2016-2017 Mentor for 'Directed Reading Program', (University of Chicago):
"Internal set theory", D. Bejarano (Spring '17);
"Nonstandard universes", D. Bejarano (Winter '17);
"Representations of Lie Groups", A. Zimmerman (Fall '16);

2016 Advisor for summer REU projects, (University of Chicago):
"The fundamental group and Seifert-Van Kampen's theorem", K. Gallagher;
"The Sylow theorems and their applications", A. Idelhaj;
"Spectral theory and applications", J. Li.

2015-2016 Mentor for 'Directed Reading Program', (University of Chicago):
"Representations of Matrix Groups", A. Zimmerman (Spring '16);
"Differential Geometry", A. Zimmerman (Winter '16);
"Differential Geometry", A. Zimmerman (Fall '15);

2015 Advisor for summer REU projects, (University of Chicago):
"Bundles, Stiefel-Whitney classes, and braid groups", P. Haine;
"The topology of spaces of polynomials via vector bundle theory", R. VanWhy.

2014-2015 Mentor for 'Directed Reading Program', (University of Chicago):
"Model Theory in Algebraic Geometry", K. Gannon (Spring '15);
"Forcing in Set Theory", K. Gannon (Winter '15);
"Forcing in Set Theory", K. Gannon (Fall '14);

2014-2015 'IMPACT' mentor for an incoming international student, (University of Chicago).

2014 Advisor for summer REU projects, (University of Chicago):
"Incompleteness in ZFC", V. Zhang;
"Intro. to the Keisler Order", K. Gannon.