

Newark Campus  
Department of Mathematics  
The Ohio State University  
niles@math.osu.edu  
<https://nilesjohnson.net>

---

## Employment

<b>Associate Professor</b> Department of Mathematics, The Ohio State University, Newark	2018 – present
<b>Assistant Professor</b> Department of Mathematics, The Ohio State University, Newark	August 2012 – 2018
<b>Postdoctoral Associate in Mathematical Ecology</b> Odum School of Ecology, University of Georgia	May 2012 – August 2012
<b>VIGRE Postdoctoral Associate</b> Department of Mathematics, University of Georgia	August 2009 – May 2012

## Education

<b>University of Chicago, IL</b> Ph.D. in Mathematics, August 2009 M.S. in Mathematics, May 2005	2003 – 2009
<b>University of Rochester, NY</b> B.A., M.A., majoring in Mathematics, May 2003	1999 – 2003

## Honors and Awards

<b>Scholarly Accomplishment Award</b> Newark Campus, Tenure-track category.	March 2018
<b>Teaching Excellence Award</b> Newark Campus, Tenure-track category.	March 2016
<b>Service Award</b> Newark Campus, Tenure-track category.	March 2016

## Books

- Homotopy Theory of Enriched Mackey Functors** [arXiv:2212.04276](#)  
Joint with Donald Yau. Accepted to *LMS Lecture Notes, Cambridge University Press*.
- Bimonoidal Categories,  $E_n$ -Monoidal Categories, and Algebraic  $K$ -Theory** [arXiv:2107.10526](#)  
Joint with Donald Yau. Submitted.
- 2-Dimensional Categories** [arxiv:2002.06055](#)  
Joint with Donald Yau. *Oxford University Press* (2021) ISBN: 9780198871378. Known Errata.

## Research Articles

- Universal pseudomorphisms, with applications to diagrammatic coherence for braided and symmetric monoidal functors** [arXiv:2312.11261](#)  
Joint with Nick Gurski. Submitted.
- The symmetric monoidal 2-category of permutative categories** [arXiv:2211.04464](#)  
Joint with Nick Gurski and Angélica Osorno. To appear in *Higher Structures*.
- Multicategories Model All Connective Spectra** [arXiv:2111.08653](#)  
Joint with Donald Yau. *Homology, Homotopy and Applications*. Vol. 25 (2023), No. 1, pp 147–172.
- Multifunctorial  $K$ -Theory is an Equivalence of Homotopy Theories** [arXiv:2205.08401](#)  
Joint with Donald Yau. *Journal of Homotopy and Related Structures*. Vol. 17 (2022), pp 569–592.
- Homotopy Equivalent Algebraic Structures in Multicategories and Permutative Categories** [arXiv:2202.13659](#)  
Joint with Donald Yau. *Theory and Applications of Categories*. Vol. 38 (2022) No. 30, pp 1156–1208.
- Multifunctorial Inverse  $K$ -Theory** [arXiv:2109.01430](#)  
Joint with Donald Yau. *Annals of  $K$ -Theory*. Vol. 7 (2022), No. 3, pp 507–548
- 2-categorical opfibrations, Quillen's Theorem B, and  $S^{-1}S$**  [arxiv:2010.11173](#)  
Joint with Nick Gurski and Angélica Osorno. *New York Journal of Mathematics*. Vol. 27 (2021), pp 1009–1059.
- The 2-dimensional stable homotopy hypothesis** [arxiv:1712.07218](#)  
Joint with Nick Gurski and Angélica Osorno. *Journal of Pure and Applied Algebra*. Vol. 223 (2019) No. 10, pp 4348–4383.

- K-theory for 2-categories** [arxiv:1503.07824](#)  
Joint with Nick Gurski and Angélica Osorno. *Advances in Mathematics*.  
Vol. 322 (2017), pp 378–472.
- Stable Postnikov data of Picard 2-categories** [arxiv:1606.07032](#)  
Joint with Nick Gurski, Angélica Osorno, and Marc Stephan. *Algebraic & Geometric Topology*.  
Vol. 17 (2017) Iss. 5, pp 2763–2806.
- Extending homotopy theories across adjunctions** [arxiv:1508.00054](#)  
Joint with Nick Gurski and Angélica Osorno. *Homology, Homotopy and Applications*.  
Vol. 19 (2017), No. 2, pp 89–110.
- Lifting homotopy  $T$ -algebra maps to strict maps** [arxiv:1301.1511](#)  
Joint with Justin Noel. *Advances in Mathematics*.  
Vol. 264 (2014), pp 593–645.
- Azumaya Objects in Triangulated Bicategories** [arxiv:1005.4878](#)  
*Journal of Homotopy and Related Structures*.  
Vol. 9 (2014) No. 2, pp 465–493.
- First cohomology for finite groups of Lie type: simple modules with small dominant weights** [arxiv:1010.1203](#)  
Joint with UGA VIGRE Algebra Group. *Transactions of the American Mathematical Society*.  
Vol. 365 (2013) No. 2, pp 1025–1050.
- Modeling stable one-types** [arxiv:1201.2686](#)  
Joint with Angélica Osorno. *Theory and Applications of Categories*.  
Vol. 26 No. 20 (2012), pp 520–537.
- Second cohomology for finite groups of Lie type** [arxiv:1110.0228](#)  
Joint with UGA VIGRE Algebra Group. *Journal of Algebra*.  
Vol. 360 (2012), pp 21–52.
- For complex orientations preserving power operations,  $p$ -typicality is atypical** [arxiv:0910.3187](#)  
Joint with Justin Noel. *Topology and its Applications*.  
Vol. 157 (2010) pp 2271–2288.

## Expository Articles

- Calculating complex cosine clusters** 2022  
Joint with Alan Loper and Greg Oman. *Pi Mu Epsilon Journal*, Vol. 15 (2022), No. 7, pp. 405–414.
- Topological Invariants from Higher Categories** 2019  
Joint with Nick Gurski and Angélica Osorno. *Notices of the American Mathematical Society*,

Vol. 66 (2019) No. 8, pp. 1225–1237

## Computer Software

- Visualization of  $A(2)$**  February 2013  
 Joint with Robert Bruner. Interactive javascript application for visualizing multiplicative structure of Steenrod subalgebra.  
 Available at <https://nilesjohnson.net/Aof2/>.
- Multivariate Power series Arithmetic** August 2011  
 Sage software peer-reviewed and included since version 4.7.1
- Composition factors of Weyl modules** July 2011  
 Sage software for computing composition factors of certain Weyl modules.  
 Available at <https://nilesjohnson.net/rep-thy.html>.

## Invited Talks 2016–present

- Graded Picard categories and the 2-type of the sphere**  
 Topology Seminar, University of Haifa April 2022  
 Algebra Seminar, Florida State University March 2022
- Algebraic  $K$ -theory for 2-categories**  
 Colloquium, Florida State University March 2022  
 Colloquium, University of Louisiana, Lafayette February 2021  
 Topology Seminar, University of Chicago March 2020  
 Colloquium, Case Western Reserve University November 2019
- Visualizing the Hopf fibration**  
 Colloquium, Reed College October 2020
- Homotopy theory of Picard categories**  
 Topology Seminar, Case Western Reserve University November 2019
- The algebra of stable 2-types**  
 Topology Seminar, Johns Hopkins University February 2019
- A 2-categorical group-completion**  
 Topology Seminar, University of Kentucky February 2019

<b>The 2-dimensional stable homotopy hypothesis</b> AMS Spring Sectional Meeting, Vanderbilt University	April 2018
<b>A 2-categorical group completion</b> Special Session on Homotopy Theory, AMS Spring Central Sectional Meeting, Indiana University	April 2017
<b>Categorical models in homotopy theory</b> Topology Seminar, University of Kentucky	March 2017
<b>Algebraic models of stable Postnikov invariants</b> Workshop on “Operations in Highly Structured Homology Theories” Banff International Research Station	May 2016

## Animations

<b>Hopf fibration – fibers and base</b> <a href="https://nilesjohnson.net/hopf">https://nilesjohnson.net/hopf</a> Shows Hopf fibration via projection to 3-ball.	August 2011
<b>Visualizing Seven-Manifolds</b> <a href="https://nilesjohnson.net/seven-manifolds">https://nilesjohnson.net/seven-manifolds</a> Gives a visualization of exotic seven-spheres and related manifolds. Presented at the Second Abel Conference in celebration of John Milnor.	January 2012

## Teaching 2016–Present

<b>Calculus</b> Ohio State University, Newark	2020, 2023
<b>Calculus II</b> Ohio State University, Newark	2023
<b>College Algebra</b> Ohio State University, Newark	2021–2022
<b>Calculus and its History for Teachers</b> Ohio State University, Newark	2016, 2018
<b>Algebra and Coordinate Geometry for Teachers</b> Ohio State University, Newark	2015, 2017, 2019
<b>Measurement and Geometry for Teachers</b>	2014 – 2019

Ohio State University, Newark

**Number and Operations for Teachers** 2014 – 2018  
Ohio State University, Newark

## Ph.D. Students

**Amogh Parab** 2020–present

**Michael Horst** Graduated 2020

**Corey Staten** Graduated 2018

## Service 2016–Present

**Site Administrator, MathMeetings.net** 2010 – present  
<https://mathmeetings.net>

**Past-Chair, Faculty Assembly** 2022 – 2023  
Ohio State University, Newark Campus

**Chair, Faculty Assembly** 2021 – 2022  
Ohio State University, Newark Campus

**Vice-Chair, Faculty Assembly** 2020 – 2021  
Ohio State University, Newark Campus

**Academic Affairs Committee** 2017 – 2019  
Ohio State University, Newark campus

**Presenter, Mrs. Gordon’s 2nd grade class** December 09, 2022  
“Snowflake Symmetry”  
Garfield Elementary School

**Presenter, Math Collaboration Group** February 20, 2022  
“Euler Characteristic: An introduction to algebraic topology”  
Ohio High School Students

**Organizer, Mayday 2019 Conference** October 4 – 6 2019  
University of Chicago; <https://nilesjohnson.net/mayday2019/>

**Presenter, Teaching and Learning Seminar** February 28, 2019  
“Constructing mathematical knowledge for elementary educators”  
University of Kentucky

- 
- Presenter, Blowing Off STEAM** January 9, 2018  
"Confessions of a Mathematician"  
Thirty One West
- Presenter, Franklinton Friday** December 8, 2017  
"Snowflake Symmetry"  
OSU STEAM Factory
- Presenter, Ms. Cline's 2nd grade class** December 15, 2017  
"Snowflake Symmetry"  
Garfield Elementary School
- Secretary, Faculty Assembly** 2015 – 2016  
Ohio State University, Newark campus
- Panelist, AWM Panel Discussion** August 2016  
"Prioritizing Your Career and Professional Goals"  
Mathfest, Columbus OH
- Organizer, Spring 2016 Midwest Topology Seminar** May 14, 2016  
Ohio State University, Columbus campus  
<https://nilesjohnson.net/MTS>
- Organizer, 2016 Pi Measurement Challenge** March 13, 2016  
Great Circle Earthworks, Newark, Ohio  
<https://u.osu.edu/piday>
- Presenter, Chamber of Commerce After Hours** February 18, 2016  
Ohio State University, Newark campus