

Curriculum Vitae

Pace P. Nielsen

Contact Information:

Brigham Young University
Department of Mathematics
318 TMCB
Provo, UT 84602
Email: pace@math.byu.edu
Office Phone: 801-422-7884

Education:

BS, Mathematics, May 2001
Brigham Young University, Utah

Ph.D., Mathematics, May 2006
University of California, Berkeley
Advisor: T.Y. Lam

Professional Positions:

Professor	Brigham Young University	2020–present
Associate Professor	Brigham Young University	2015–2020
Assistant Professor	Brigham Young University	2009–2015
Post-doctoral Fellow	The University of Iowa	2006–2009

Published Books:

3. Pace P. Nielsen: *Algebra Through the Lens of Abstraction*. Version 1.01, 2021.
2. Pace P. Nielsen: *A Journey Through Formal Mathematics*. Version 1.03, 2022.
1. Darrin Doud and Pace P. Nielsen: *A Transition to Advanced Mathematics*. Version 1.03, 2022.
58. Xavier Mary and Pace P. Nielsen: *IC rings and transitivity of perspectivity*. J. Algebra Appl. 21(8):2250151 (8 pages), 2022.
57. Cody S. Hansen and Pace P. Nielsen: *Prime factors of $\Phi_3(x)$ of the same form*. Integers 22:A71, 9 pp., 2022.
56. Thomas L. Draper, Pace P. Nielsen, and Janez Šter: *Nilpotent polynomials and nilpotent coefficients*. J. Algebra 602:405–440, 2022.
55. BYU Computational Number Theory Group: *Odd, spoof perfect factorizations*. J. Number Theory 234:31–47, 2022.
54. Dinesh Khurana and Pace P. Nielsen: *Transitivity of perspectivity*. Algebr. Represent. Theory 25(1):281–287, 2022.
53. Pace P. Nielsen: *Definitional schemes for primitive recursive and computable functions*. Computability 11(1):1–8, 2022.

52. Dinesh Khurana and Pace P. Nielsen: *Perspectivity and von Neumann regularity*. Comm. Alg. 49(12):5483–5499, 2021.
51. Dinesh Khurana, T. Y. Lam, Pace P. Nielsen, and Janez Šter: *Special clean elements in rings*. J. Algebra Appl. 19(11):2050208 (27 pages), 2020.
50. Jongwook Baeck, Nam Kyun Kim, Yang Lee, Pace P. Nielsen: *Zero-divisor placement, a condition of Camillo, and the McCoy property*. J. Pure Appl. Algebra 224(12):106432 (14 pages), 2020.
49. Robert D. Hough and Pace P. Nielsen: *Covering systems with restricted divisibility*. Duke Math. J. 168(17):3261–3295, 2019.
48. Anjana Khurana, Dinesh Khurana, and Pace P. Nielsen: *Symmetries in idempotent factorizations*. J. Algebra Appl. 18(5):1950084 (10 pages), 2019.
47. Chris J. Conidis, Pace P. Nielsen, and Vandy Tombs: *Transfinitely valued Euclidean domains have arbitrary indecomposable order type*. Comm. Alg. 47(3):1105–1113, 2019.
46. T. Y. Lam and Pace P. Nielsen: *Jacobson pairs and Bott-Duffin decompositions in rings*. Rings, Modules and Codes, Contemporary Mathematics Series 727:249–267, 2019.
45. D.H.J. Polymath (Tobias Fritz, Siddhartha Gadgil, Apoorva Khare, Pace P. Nielsen, Lior Silberman, and Terence Tao): *Homogeneous length functions on groups*. Algebra Number Theory 12(7):1773–1786, 2018.
44. Chan Yong Hong, Nam Kyun Kim, Blake W. Madill, Pace P. Nielsen, and Michał Ziómbowski: *Homogeneous nilradicals over semigroup graded rings*. J. Pure Appl. Algebra 222(7):1513–1528, 2018.
43. Dinesh Khurana, T. Y. Lam, and Pace P. Nielsen: *An ensemble of idempotent lifting hypotheses*. J. Pure Appl. Algebra 222(6):1489–1511, 2018.
42. Pace P. Nielsen and Janez Šter: *Connections between unit-regularity, regularity, cleanness, and strong cleanness of elements and rings*. Trans. Amer. Math. Soc. 370(3):1759–1782, 2018.
41. Chan Yong Hong, Nam Kyun Kim, Yang Lee, and Pace P. Nielsen: *Amitsur’s property for skew polynomials of derivation type*. Rocky Mountain J. Math. 47(7):2197–2218, 2017.
40. Dinesh Khurana, T. Y. Lam, and Pace P. Nielsen: *Exchange elements in rings, and the equation $XA - BX = I$* . Trans. Amer. Math. Soc. 369(1):495–516, 2017.
39. Pace P. Nielsen: *The behavior of ascending chain conditions on submodules of bounded finite generation in direct sums*. Israel J. Math 215(1):339–347, 2016.

38. Dinesh Khurana, T. Y. Lam, and Pace P. Nielsen: *Exchange rings, exchange equations, and lifting properties*. Internat. J. of Alg. and Comput. 26(6):1177–1198, 2016.
37. George M. Bergman and Pace P. Nielsen: *On Vaughan Pratt’s crossword problem*. J. London Math. Soc. 93(3):825–845, 2016.
36. Alexander J. Diesl, Samuel J. Dittmer, and Pace P. Nielsen: *Idempotent lifting and ring extensions*. J. Algebra Appl. 15(6):1650112 (16 pages), 2016.
35. Victor P. Camillo and Pace P. Nielsen: *Half-othogonal sets of idempotents*. Trans. Amer. Math. Soc. 368(2):965–987, 2016.
34. Ryszard Mazurek, Pace P. Nielsen, and Michał Ziembowski: *Commuting idempotents, square-free modules, and the exchange property*. J. Algebra 444(15):52–80, 2015.
33. Pace P. Nielsen: *Odd perfect numbers, Diophantine equations, and upper bounds*. Math. Comp. 84(295):2549–2567, 2015.
32. Dinesh Khurana, T. Y. Lam, and Pace P. Nielsen: *Two-sided properties of elements in exchange rings*. Algebr. Represent. Theory 18(4):931–940, 2015.
31. Pace P. Nielsen and Michał Ziembowski: *Derivations and bounded nilpotence index*. Internat. J. Algebra Comput. 25(3):433–438, 2015.
30. Dinesh Khurana, T. Y. Lam, Pace P. Nielsen, and Yiqiang Zhou: *Uniquely clean elements in rings*. Comm. Alg. 43(5):1742–1751, 2015.
29. Ryszard Mazurek, Pace P. Nielsen, and Michał Ziembowski: *The upper nilradical and Jacobson radical of semigroup graded rings*. J. Pure Appl. Algebra 219(4):1082–1094, 2015.
28. DHJ Polymath: *Variants of the Selberg sieve, and bounded intervals containing many primes*. Research in the Mathematical Sciences 1:12, 2014.
27. Chan Yong Hong, Nam Kyun Kim, and Pace P. Nielsen: *Radicals in skew polynomial and skew Laurent polynomial rings*. J. Pure Appl. Algebra 218(10):1916–1931, 2014.
26. Anjana Khurana, Dinesh Khurana, and Pace P. Nielsen: *Sums of units in self-injective rings*. J. Algebra Appl. 13(6):1450020 (7 pages), 2014.
25. Samuel J. Dittmer, Dinesh Khurana, and Pace P. Nielsen: *On a question of Hartwig and Luh*. Bull. Austral. Math. Soc. 89:271–278, 2014.
24. T. Y. Lam and Pace P. Nielsen: *Jacobson’s lemma for Drazin inverses*. Ring Theory and Its Applications, Contemporary Mathematics Series 602:185–195, 2014.

23. Victor Camillo, Thomas J. Dorsey, and Pace P. Nielsen: *Dedekind-finite strongly clean rings*. Comm. Alg. 42(4):1619–1629, 2014.
22. T. Y. Lam and Pace P. Nielsen: *Inner inverses and inner annihilators in rings*. J. Algebra 397:91–110, 2014.
21. Pace P. Nielsen: *Simplifying Smoktunowicz’s extraordinary example*. Comm. Alg. 41(11):4339–4350, 2013.
20. Alexander J. Diesl, Chan Yong Hong, Nam Kyun Kim, and Pace P. Nielsen: *Properties which do not pass to classical rings of quotients*. J. Algebra 379:208–222, 2013.
19. Pace P. Nielsen: *Bootstrapping the bounded nilradical*. J. Pure Appl. Algebra 217(9):1711–1715, 2013.
18. Chan Yong Hong, Nam Kyun Kim, Yang Lee, and Pace P. Nielsen: *On σ -nil ideals of bounded index of σ -nilpotence*. J. Algebra 371:492–509, 2012.
17. S. Adam Fletcher, Pace P. Nielsen, and Pascal Ochem: *Sieve methods for odd perfect numbers*. Math. Comp. 81(279): 1753–1776, 2012.
16. David Cardon and Pace P. Nielsen: *Nonnegative minors of minor matrices*. Linear Algebra Appl. 436(6): 2187–2200, 2012.
15. Victor Camillo and Pace P. Nielsen: *On a theorem of Camps and Dicks*. Advances in Ring Theory, 83–84, Birkhäuser, Basel, Switzerland, 2010.
14. Victor Camillo, Chan Yong Hong, Nam Kyun Kim, Yang Lee, and Pace P. Nielsen: *Nilpotent ideals in polynomial and power series rings*. Proc. Amer. Math. Soc. 138(5): 1607–1619, 2010.
13. Pace P. Nielsen: *Square-free modules with the exchange property*. J. Algebra 323(7): 1993–2001, 2010.
12. Chan Yong Hong, Nam Kyun Kim, Yang Lee, and Pace P. Nielsen: *The minimal prime spectrum of rings with annihilator conditions*. J. Pure Appl. Algebra 213(7): 1478–1488, 2009.
11. Pace P. Nielsen: *A covering system whose smallest modulus is 40*. J. Number Theory 129(3): 640–666, 2009.
10. Victor Camillo and Pace P. Nielsen: *McCoy rings and zero-divisors*. J. Pure Appl. Algebra 212(3): 599–615, 2008.
9. Victor Camillo, Ivo Herzog, and Pace P. Nielsen: *Non-self-injective injective hulls with compatible multiplication*. J. Algebra 314(1): 471–478, 2007.
8. Pace P. Nielsen: *Odd perfect numbers have at least nine distinct prime factors*. Math. Comp. 76(260): 2109–2126, 2007.

7. Pace P. Nielsen: *Row and column finite matrices*. Proc. Amer. Math. Soc. 135(9): 2689–2697, 2007.
6. Pace P. Nielsen: *Countable exchange and full exchange rings*. Comm. Algebra 35(1): 3–23, 2007.
5. Pace P. Nielsen: *The exchange property for modules and rings*. Ph.D. thesis, University of California, Berkeley, May 2006.
4. Pace P. Nielsen: *Semi-commutativity and the McCoy condition*. J. Algebra 298(1): 134–141, 2006.
3. Pace P. Nielsen: *Abelian exchange modules*. Comm. Algebra 33(4): 1107–1118, 2005.
2. Pace P. Nielsen: *An upper bound for odd perfect numbers*. Integers 3:A14, 9 pp., 2003.
1. David Cardon and Pace P. Nielsen: *Convolution operators and entire functions with simple zeros*. Number theory for the millennium, I (Urbana, IL, 2000), 153–181, A K Peters, Natick, MA, 2002.

Awards

- 2022–2026 Simon’s Foundation Collaboration Grant for Mathematicians, Award #963435
- 2021–2022 College Outstanding Teaching Award
- 2019–2021 Savage Teaching Award
- 2016–2018 NSA-AMS Young Investigator Award
- 2016–2017 University Young Scholar Award
- 2016 College Young Scholar Award
- 2016 Distinguished Research Award—Brigham Young University, Department of Mathematics
- 2014–2019 Simon’s Foundation Collaboration Grant for Mathematicians, Award #315828
- 2014 Distinguished Citizenship Award—Brigham Young University, Department of Mathematics
- December 2012 Distinguished Research Award—Brigham Young University, Department of Mathematics
- 2012 Distinguished Teaching Award—Brigham Young University, Department of Mathematics

- 2010–2013 MEG grant—Brigham Young University
- 2009–2011 Project NExT Fellow
- 2006–2009 NSF VIGRE Postdoctoral Fellowship—University of Iowa
- 2005 Spring Semester, Mathematics Department Fellowship—University of California, Berkeley
- 2004 Outstanding Graduate Student Instructor—University of California, Berkeley
- 2001–2002 NSF VIGRE Fellowship—University of California, Berkeley
- 2001 Orson Pratt Prize—annual award presented by Brigham Young University to the outstanding graduating student in mathematics

Editorial Positions

- *Communications in Algebra*. Associate editor. Appointment May 2022 to present.
- *International Electronic Journal of Algebra*. Editor in the area of ring theory. Appointment August 2020 to present.
- *Contributions to Algebra and Geometry*, Springer. Editor in the area of ring theory. Appointment October 2016 to November 2021. Handled over 100 papers.

Presentations

- *Connections between elementwise properties*, Hefei University of Technology, China (via VooV) August 18, 2022.
- *Lifting periodic elements*, 35th Ohio State–Denison Mathematics Conference, Columbus, OH May 13, 2022.
- *Nilpotent polynomials with non-nilpotent coefficients*, ONCAS (Online Noncommutative Algebra Seminar, via Zoom) March 15, 2022.
- *Lifting periodic elements*, 87th Annual Conference of the Indian Mathematical Society (via Teams) December 6, 2021.
- *Spoof odd perfect numbers*, UCCS Math Colloquium Series (via Zoom) November 18, 2021.
- *Spoof odd perfect numbers*, VCU Discrete Mathematics Seminar (via Zoom) October 13, 2021.
- *Nilpotent polynomials with non-nilpotent coefficients*, Two Day Conference on Mathematics, Panjab University, Chandigarh, India February 13, 2020.
- *Gaps between prime numbers*, The Fourth Sarvadaman Chowla Memorial Lecture, Panjab University, Chandigarh, India February 12, 2020.

- *Nilpotent polynomials with non-nilpotent coefficients*, Plenary talk at the Eighth China–Japan–Korea International Symposium on Ring Theory, Nagoya, Japan August 28, 2019.
- *Why Euclidean domains are both easier and harder than you think*, Invited talk at the colloquium at Stony Brook, NY September 20, 2018.
- *Unique product groups and Kaplansky’s conjecture*, 34th Ohio State–Denison Mathematics Conference, Columbus, OH May 19, 2018.
- *Just how complicated can Euclidean domains get?*, Invited talk at the Noncommutative Rings and their Applications Conference, Lens, France, June 12, 2017.
- *Clean rings and exchange rings*, University of Warsaw Algebra Seminar, Warsaw, Poland, June 8, 2017.
- *Transfinite Euclidean domains*, UGA, Algebra Seminar, Athens, GA, March 26, 2017.
- *Using free constructions to answer questions in algebra*, University of Utah, Commutative Algebra Seminar, Salt Lake City, UT, October 7, 2016.
- *Idempotent lifting and beyond*, Invited talk at the AMS Fall Eastern Sectional Meeting, Brunswick, ME, September 24, 2016.
- *Ascending chain conditions*, 33rd Ohio State–Denison Mathematics Conference, Columbus, OH, May 13, 2016. (Co-organizer for the conference.)
- *Ascending chain conditions over free modules: unexpected behavior*, Invited talk at the Algebra Day Conference, Berkeley, CA, June 6, 2015.
- *Bott-Duffin decompositions*, Invited talk at Hanbat National University, August 11, 2014.
- *Idempotent lifting properties*, The 32nd Ohio State - Denison Mathematics Conference, May 10, 2014.
- *Jacobson pairs preserve properties*, Classical Aspects of Ring Theory and Module Theory conference in Bedlewo Poland, July 17, 2013.
- *Jacobson pairs and regular elements*, Invited talk at the AMS Spring Central Sectional Meeting, April 28, 2013.
- *Jacobson’s lemma, Drazin inverses, and strongly clean rings*, Invited talk at the AMS Spring Western Sectional Meeting, April 13, 2013.
- *An approach to odd covering systems*, Invited talk at Joint Mathematics Meetings, January 11, 2013.
- *Odd covering systems*, UVU Math Department Colloquium, November 9, 2012.

- *The bounded nilradical*, Invited talk at the Fall Central Sectional Meeting, AMS Special Session, October 21, 2012.
- *Permutation zero-divisor properties*, Invited talk at the 16th Workshop on Ring Theory, Hanbat National University, Daejeon Korea, July, 2012.
- *The bounded nilradical*, The 31st Ohio State - Denison Mathematics Conference, May 26, 2012.
- *Covering systems*, UVU Math Department Colloquium, February 24, 2012.
- *Wieferich primes, heuristics, and computations*, Invited talk at the Joint Mathematics Meetings, January 6, 2012.
- *Dedekind-finite strongly clean rings*, Invited talk at the 6th China-Japan-Korea International Conference on Ring Theory, June 30, 2011.
- *Factor chains, sieves, and odd perfect numbers*, CNTA XI, July 15, 2010.
- *Factor chains, sieves, and odd perfect numbers*, Illinois Number Theory Conference, May 21, 2010.
- *Square-free modules with the exchange property*, Invited talk at the Joint Meeting of the AMS-KMS, December 16, 2009.
- *Congruence classes and covering systems*, Brigham Young University, REU, July 14, 2009.
- *Covering systems*, University of Iowa, Algebra Seminar, April 7, 2009.
- *Covering systems old and new*, University of Illinois, Urbana-Champaign, AMS Special Session on Number Theory in the Spirit of Erdos, March 28, 2009.
- *A covering system with minimum modulus 40*, University of Illinois, Urbana-Champaign, Number Theory Seminar, Sept. 18, 2008.
- *Polynomials and Nilpotence I and II*, University of Iowa, Algebra Seminar, April 21 and 28, 2008.
- *A Simple Proof of the Camps-Dicks Theorem*, University of Iowa, Algebra Seminar, April 14, 2008.
- *Erdős' Favorite Problem*, University of Iowa, Graduate and Undergraduate Student Seminar, March 27, 2008.
- *Injective Hulls with Compatible Multiplication I and II*, University of Iowa, Algebra Seminar, Sept. 11 and 18, 2007.
- *Covering Systems*, University of Iowa, Graduate and Undergraduate Student Seminar, Sept. 10, 2007.

- *Row and Column-finite Matrices*, Ohio University Zanesville, International Conference on Rings and Things, June, 2007.
- *An Old Problem in Number Theory: Odd Perfect Numbers*, University of Illinois Urbana-Champaign, Number Theory Fest, May 16-20, 2007.
- *The Exchange Property for Rings and Modules*, Brigham Young University, Colloquium, Feb. 16, 2006.

Graduate Students

- Michael Walton, MS, Jan. 2022–Present.
Thesis: *Bézout domains*. (In progress.)
- Ben Schoonmaker, PhD, Mar. 2015–Oct. 2018.
Dissertation: *Clean Indices of Common Rings*.
- Lindsay Soelberg, MS, Sept. 2017–May 2018.
Thesis: *Finding Torsion-free Groups Which Do Not Have the Unique Product Property*.
- Vandy Tombs, MS, Sept. 2017–May 2018.
Thesis: *Euclidean Domains*.
 - ◊ Chris J. Conidis, Pace P. Nielsen, and Vandy Tombs: *Transfinitely valued Euclidean domains have arbitrary indecomposable order type*. Comm. Alg. 47(3):1105–1113, 2019.
- Tyler Owens, MS, Sept. 2013–Dec. 2014.
Thesis: *A covering system with minimum modulus 42*.

Undergraduate Research Students

- Thomas L. Draper, Sept. 2018–Dec. 2019 and Jan. 2022–Present.
 - ◊ Thomas L. Draper, Pace P. Nielsen, and Janez Šter: *Nilpotent polynomials and nilpotent coefficients*. J. Algebra 602:405–440, 2022.
- Cody S. Hansen, Nov. 2021–Dec. 2022.
 - ◊ Cody S. Hansen and Pace P. Nielsen: *Prime factors of $\Phi_3(x)$ of the same form*. Integers 22:A71, 9 pp., 2022.
- Samuel J. Dittmer, Sept. 2011–May 2014.
 - ◊ Alexander Diesl, Samuel J. Dittmer, and Pace P. Nielsen: *Idempotent lifting properties which do not lift to ring extensions*, J. Algebra Appl. 15(6):1650112 (16 pages), 2016.

- ◇ Samuel J. Dittmer, Dinesh Khurana, and Pace P. Nielsen: *On a question of Hartwig and Luh*, Bull. Aust. Math. Soc. 89:271–278, 2014.
 - ◇ Samuel J. Dittmer: *Spoof odd perfect numbers*, Math. Comp. 83:2575–2582, 2014.
- S. Adam Fletcher, Sept. 2009–May 2011.
 - ◇ S. Adam Fletcher, Pace P. Nielsen, and Pascal Ochem: *Sieve methods for odd perfect numbers*, Math. Comp. 81(279):1753–1776, 2012.

Course Instructor:

At Brigham Young University

Math 406R—A Journey Through Formal Mathematics	Fall 2022
Math 290—Fundamentals of Mathematics	Winter 2022
Math 371—Abstract Algebra I	Fall 2021
Math 112—Calculus I	Winter 2021
Math 406R—A Journey Through Formal Mathematics	Winter 2021
Math 290—Fundamentals of Mathematics	Fall 2020
Math 572—Algebra II	Winter 2020
Math 290—Fundamentals of Mathematics	Fall 2019
Math 571—Algebra I	Fall 2019
Math 572—Algebra II	Winter 2019
Math 290—Fundamentals of Mathematics	Fall 2018
Math 675-R—Special Topics in Algebra	Winter 2018
Math 112—Calculus I	Winter 2018
Math 371—Abstract Algebra I	Fall 2017
Math 290—Fundamentals of Mathematics	Fall 2017
Math 572—Algebra II	Winter 2017
Math 290—Fundamentals of Mathematics	Winter 2017
Math 571—Algebra I	Fall 2016
Math 290—Fundamentals of Mathematics	Fall 2016
Math 371—Abstract Algebra I	Fall 2015
Math 112—Calculus I	Fall 2015
Math 391-R—Seminar in Math (Putnam Team)	Winter 2015
Math 677-2—Homological Algebra 2	Winter 2015
Math 290—Fundamentals of Mathematics	Fall 2014
Math 677—Homological Algebra	Fall 2014
Math 290—Fundamentals of Mathematics	Winter 2014
Math 676—Commutative Algebra	Winter 2014
Math 290—Fundamentals of Mathematics	Fall 2013
Math 673—Algebra III	Fall 2013
Math 372—Abstract Algebra II	Winter 2013
Math 587—Analytic Number Theory	Winter 2013

Math 313—Elementary Linear Algebra	Fall 2012
Math 672—Algebra II	Winter 2012
Math 290—Fundamentals of Mathematics	Fall 2011
Math 671—Algebra I	Fall 2011
Math 672—Algebra II	Winter 2011
Math 290—Fundamentals of Mathematics	Fall 2010
Math 671—Algebra I	Fall 2010
Math 112—Calculus I	Winter 2010
Math 371—Abstract Algebra I	Winter 2010
Math 113—Calculus II	Summer 2009

I also taught classes at the University of Iowa and the University of California, Berkeley.