

Mahir Bilen Can

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| Employment: | 2014-Present | Associate Professor | Tulane University. |
| | 2008-2014 | Assistant Professor | Tulane University. |
| | 2006-2008 | Postdoctoral Fellow | University of Western Ontario. |

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| Visiting Positions: | Spring 2017 | UC San Diego. |
| | 2012-2013 | Yale University. |
| | February 2013 | The Chinese University of Hong Kong. |

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| Education: | May 2006 | Ph.D. in Mathematics | University of Pennsylvania, United States. |
| | June 2001 | B.Sc. in Mathematics | Middle East Technical University, Türkiye. |

Publications:

Preprints (submitted, or to be submitted):

- *Loop-augmented forests and variant of Foulkes' conjecture* (with Jeff Remmel).
<https://arxiv.org/abs/1708.02995>
- *On the cohomology rings of Grassmann varieties and Hilbert schemes* (with Jeff Remmel).
<https://arxiv.org/abs/1706.02713>
- *The genesis of involutions (polarizations and lattice paths)* (with Özlem Uğurlu)
<https://arxiv.org/abs/1703.09881>
- *Spherical product of a partial flag variety with a symmetric space.*
<https://arxiv.org/abs/1703.05076>
- *The cross section of a spherical double cone.*
<https://arxiv.org/abs/1703.03955>
- *Combinatorial models for the variety of complete quadrics* (with S. Banerjee and M. Joyce)
<https://arxiv.org/abs/1610.02698>
- *Equivariant K-theory of smooth projective spherical varieties* (with S. Banerjee)
<http://arxiv.org/abs/1603.04926>
- *Complex G_2 and associative grassmannian* (with S. Akbulut)
<http://arxiv.org/abs/1512.03191>

- *Special embeddings of symmetric varieties and their Borel orbits* (with R. Howe and L. Renner).
<http://arxiv.org/pdf/1408.2682v1.pdf>
- *A representation on labeled rooted forests*
<https://arxiv.org/abs/1506.01543>
- *The rook monoid is lexicographically shellable*
<http://arxiv.org/pdf/1001.5104.pdf>
- *Wonderful Symmetric Varieties and Schubert Polynomials* (with M. Joyce and B. Wyser).
To appear in *Ars Mathematica Contemporanea*
<http://arxiv.org/pdf/1509.03292v1.pdf>

Published papers:

- *Monodromy of torus fibrations and decomposability problem* (with M. Topkara)
Topology and Its Applications 222 (2017), 165–176.
- *An Analogue of Springer fibers in certain wonderful compactifications* (with R. Howe and M. Joyce). *Journal of Algebra and its Applications* 16 (2017), no. 9.
- *Corrigendum to “Generators of the Hecke algebra of (S_{2n}, B_n) ”* (with Ş. Özden).
Advances in Mathematics
Volume 308, 21 February 2017, Pages 1337–1339
Extended version: <http://arxiv.org/pdf/1407.3700v1.pdf>
- *Toroidal affine Nash groups*
Journal of Lie Theory 26 (2016), no. 4, 1069–1077.
- *Chains in Weak Order Posets Associated to Involutions* (with M. Joyce and B. Wyser).
J. Combin. Theory Ser. A 137 (2016), 207–225.
- *Lexicographic shellability of the Bruhat-Chevalley order on fixed-point-free involutions*
with Y. Cherniavsky and T. Twelbeck. *Israel J. Math.* 207 (2015), no. 1, 281–299.
- *Divisors and specializations of Lucas polynomials*
with T. Amdeberhan and M. Jensen. *Journal of Combinatorics* 6 (2015), no. 1-2, 69–89.
- *Bruhat Order on Partial Fixed Point Free Involutions*
with Y. Cherniavsky and T. Twelbeck. *Electronic Journal of Combinatorics*. Volume 21, Issue 4 (2014)
- *Lexicographic Shellability of Partial Involutions*
with T. Twelbeck. *Discrete Mathematics*. Volume 335, 66–80, November 2014
- *Omitting Parentheses From the Cyclic Notation*
with Y. Cherniavsky.

- Mediterr. J. Math. 12 (2015), no. 4, 1199–1214.
- *Calculating Heegaard-Floer Homology by Counting Lattice Points in Tetrahedra* (with Ç. Karakurt). Acta Mathematica Hungarica, Issue 1, Volume 144, 43–75 (2014)
 - *Unipotent invariant matrices* (with R. Howe and M. Joyce). Linear Algebra and its Applications, 439 (2013), no. 1, 196–210.
 - *Weak order on complete quadrics* (with M. Joyce). Trans. Amer. Math. Soc. 365 (2013), no. 12, 6269–6282.
 - *Ordered Bell numbers, Hermite polynomials, skew Young tableaux and Borel orbits* (with M. Joyce). Journal of Comb. Theory, Series A. Vol. 119, Issue 8, pp. 1798–1810, (2012).
 - *Irreducible representations of semisimple algebraic groups and supersolvable lattices*. Journal of Algebra Volume 351, Issue 1 (2012), 235–250.
 - *The Bruhat-Chevalley ordering on the rook monoid* (with L.E. Renner). Turkish Journal of Math. No. 36 (2012), 499–519.
 - *From parking functions to Gelfand pairs* (with K. Aker). Proc. Amer. Math. Soc. 140 (2012), 1113 - 1124.
 - *Generators of the Hecke algebra of (S_{2n}, B_n)* (with K. Aker). Advances in Mathematics 231 (2012), no. 5, 2465–2483.
 - *Partitions, rooks, and symmetric functions in noncommuting variables* (with B. Sagan). Electron. J. Combin. 18 (2011), no. 2, Paper 3.
 - *Broken Bracelets, Molien Series, Paraffin Wax and an Elliptic Curve of Conductor 48* (with T. Amdeberhan and V. Moll). SIAM Journal on Discrete Mathematics. 25(4) (2011), pp. 1843-1859.
 - *R-polynomials of finite monoids of Lie type* (with K. Aker, M. Taşkin). Internat. J. Algebra Comput. 20 (2010), no. 6, 793–805.
 - *H-polynomials and rook polynomials* (with L.E. Renner). Internat. J. Algebra Comput. 18 (2008), no. 5, 935–949.
 - *A Proof of the q, t -square conjecture* (with N. Loehr). Journal of Comb. Theory, Series A, 113 (2006), no. 7, 1419–1434.
 - *Some plethystic identities and Kostka-Foulkes polynomials*. Ars Combinatoria 122 (2015), 411–421.
 - *SL(2)-regular subvarieties of complete quadrics* (with M. Joyce). Communication Series of Fields Institute, Book 71 (2014). (Springer.)

Proceeding Publications:

- *Branching through G_2* (with Roger Howe).
Proceedings of the Gökova Geometry-Topology Conference 2013, 41–75, Gökova Geometry/Topology Conference (GGT), Gökova, 2014.
- *On the Bruhat-Chevalley order on fixed-point-free involutions* (with Y. Cherniavsky, and T. Twelbeck).
The Seventh European Conference on Combinatorics, Graph Theory and Applications, 457–462, CRM Series, 16, Ed. Norm., Pisa, 2013.
- *On Bruhat Posets Associated to Composition* (with Y. Cherniavsky).
DMTCS Proceedings, 26th International Conference on Formal Power Series and Algebraic Combinatorics (2014).
- *Nested Hilbert schemes and the nested q, t -Catalan series*.
DMTCS Proceedings, 20th International Conference on Formal Power Series and Algebraic Combinatorics (2008).

Editorial:

- *Algebraic Monoids, Group Embeddings and Algebraic Combinatorics* (jointly edited with Zhenheng Li, Benjamin Steinberg and Qiang Wang).
Fields Institute Communication Series, Volume 71, (2014), Springer.
- *Clifford Lectures on Algebraic Groups: Structure and Actions*.
Proceedings of Symposia in Pure Mathematics series of A.M.S. Volume 94.

Book Project: *Rook Theory* (with F. Butler, J. Haglund, J. Remmel). In preparation.

Current Ph.D. Advising:

- Aram R Bingham (expected to graduate in 2019),
- Tien Li (expected to graduate in 2019),
- Şafak Özden (expected to graduate in 2018),
- Özlem Uğurlu (expected to graduate in 2018).

Past Ph.D. Advising: Tim Twelbeck, *Shellability of Bruhat Order on Borel Orbit Closures*, April 2013.

Past Undergraduate Advising:

- Rachel Ryley, *Affine Coxeter groups and Applications*, April 2014.
- Melanie Jensen, *Combinatorial Interpretation of Lucas Polynomials Using Symmetric Function Theory*, April 2013.
- Jordan Martin, *Properties and Applications of Involutions Under Bruhat Order*, April 2012.

Awards and Grants:

- Louisiana Board of Regents, Grant for graduate student education. Co-PI with Tai Huy Ha, (2017–2019).
- NSA Standard Grant, *Algebra and Combinatorics of Symmetric Varieties and Their Embeddings*, (2014–2015) \$33,226.
- Louisiana Board of Regents Research and Development Grant, *Combinatorics of Variety of Complete Quadrics*, award number: 549941C1 (2011–2014) \$146,658.
- NSF Workshop Grant, *Workshop on Algebraic Monoids, Algebraic Group Embeddings and Algebraic Combinatorics*, award number: DMS-1207770 (2012–2013) \$16,000.
- NSF Workshop Grant, *Clifford Lectures on Algebraic Groups: Structure and Actions*, award number: DMS-1522969 (2015–2016) \$12,000.

Recent Invited Talks: Invited seminars, colloquia, and conferences (abbreviated to **Sem**, **Col**, and **Conf**, respectively).

- (1) **Conf:** 30th National Mathematics Symposium of Turkish Mathematical Society, Atılım University, Ankara–Turkey, Sept. 6–9, 2017.
- (2) **Conf:** Southern Regional Algebra Conference, Mobile Alabama, March 17–19 2017.
- (3) **Conf:** Joint Meetings of the AMS. Combinatorial Invariants of Flag Manifolds and Related Varieties, Atlanta, Jan 5, 2017.
- (4) **Conf:** Gökova Geometry-Topology Conference, Akyaka/Muğla, Turkey, May 2016.
- (5) **Conf:** AMS Spring Central Sect. Meeting, U of North Dakota, Fargo, ND, April 16, 2016.
- (6) **Sem:** Discrete Mathematics Seminar, Arizona State U, Tempe, AZ, March 28, 2016.
- (7) **Conf:** AMS Spring Eastern Sect. Meeting, Stony Brook University, March 19, 2016.
- (8) **Sem:** Algebraic Geometry Seminar, Ohio State University, Columbus, OH, March 1, 2016.
- (9) **Conf:** AMS Fall Southeastern Sect. Meeting, U of Memphis, TN, Oct. 17, 2015.
- (10) **Sem:** Geometry-Topology Seminar at MSU, East Lansing, MI, Sept 12, 2015.
- (11) **Col:** Middle East Technical University, Ankara–Turkey, April 2, 2015.
- (12) **Sem:** Combinatorics Seminar at MIT, Cambridge, MA, February 18, 2015.
- (13) **Sem:** Algebra Seminar, Virginia Tech University, Blacksburg, VA, December 5, 2014.
- (14) **Sem:** Algebra and Number Theory Seminar, LSU, Baton Rouge, LA, December 2, 2014.
- (15) **Conf:** AMS Fall Southeastern Sect. Meeting, U of North Carolina, Nov. 8, 2014.
- (16) **Sem:** Algebra Seminar, University of Missouri, Columbia, MO, November 3, 2014.
- (17) **Sem:** Algebraic Geometry Seminar, Texas A&M, College Station, TX, April 21, 2014.
- (18) **Conf:** CombinaTexas 2014, Texas A&M University, TX, April 20, 2014.
- (19) **Sem:** Combinatorics and Algebraic Geometry Seminar, U of Pennsylvania, April 17, 2014.
- (20) **Conf:** AMS Spring Southeastern Sect. Meeting, U of Tennessee, TN, March 21, 2014.
- (21) **Col:** Georgia Southern University, GA, January 24, 2013.
- (22) **Conf:** Generalizations of Symmetric Spaces, Lorentz Center, Leiden, Netherlands, Nov. 26, 2013.
- (23) **Conf:** AMS Fall Central Sect. Meeting, Washington U at St. Louis, MO, Oct. 18, 2013.
- (24) **Conf:** European Conference on Combinatorics, Graph Theory, and Applications, Pisa, Italy, Sept. 2013.
- (25) **Conf:** 2013 Gökova Geometry-Topology Conference, Akyaka/Muğla, Turkey, May 2013.
- (26) **Col:** The University of Western Ontario, London, Canada, March 2013.
- (27) **Sem:** Representation Theory Seminar, CUNY, New York City, February 2013.
- (28) **Conf:** Workshop in Algebra and Geometry, The Chinese University of Hong Kong, Hong Kong, January 2013.
- (29) **Col:** Lehigh University, Lehigh, PA, November 2012.
- (30) **Sem:** Combinatorial Algebraic Geometry Seminar, Upenn, Philadelphia, PA October 2012.

- (31) **Conf:** AMS Eastern Sect. Meeting, George Washington University, DC, March 2012.
- (32) **Col:** University of South Alabama, Mobile, AL, October 2011.
- (33) **Conf:** Antalya Algebra Days XIII, International Conference, Antalya-Turkey, May 2011.
- (34) **Col:** Virginia Tech. U, Blacksburg, VT, January 2011.

Combinatorics, Fall 2017.

Lie Groups and Representation Theory (Grad), Fall 2017.

At UC San Diego: Math 20E - Vector Calculus, Spring Quarter 2017.

Calculus I, Fall 2016.

Lie Groups and Algebraic Combinatorics II(Grad), Spring 2016.

Lie Groups and Algebraic Combinatorics I(Grad), Fall 2015.

Algebra II (Grad), Spring 2015.

Algebra I (Grad), Fall 2014.

Calculus III, Fall 2014.

Lie Theory (Grad), Spring 2014.

Algebraic Combinatorics (Grad), Fall 2013.

Consolidated Calculus, Fall 2013.

At Yale: Geometry and Combinatorics of Coxeter Groups (Grad), Fall 2012.

Teaching: Combinatorics, Spring 2012.

Semisimple Lie Algebras and their Representation Theory (Grad), Fall 2011.

Consolidated Calculus, Fall 2011.

Calculus II, Spring 2011.

Calculus III, Fall 2010.

Abstract Algebra I, Fall 2010.

Calculus I, Spring 2010.

Linear Algebra, Fall 2009.

Representation Theory of Symmetric Groups (Grad), Spring 2009.

Algebraic/Enumerative Combinatorics (Grad), Fall 2008.

Finite Mathematics, Summer 2007 (at UWO).

Calculus I, Summer 2007 (at UWO).

Calculus I, Winter 2007 (at UWO).

Linear Algebra, Fall 2006 (at UWO).

Organizational (Departmental): Department of Mathematics Colloquium (2011-2012, 2013-2015), Algebra and Combinatorics Seminar (co-organizer).

Conferences and Meetings (Past and Future):

- “Workshop on Lie groups, algebras, and their representations” May 9–28, 2016.
Jointly organized with Selman Akbulut and Ferit Öztürk.
- “Algebraic Groups: Structure and Actions”
Clifford Lectures at Tulane University, March 2–5, 2015.
- “Combinatorics, Geometry, and Representation Theory of Homogeneous Spaces”
2015 Central Spring AMS Sectional Meeting,
Michigan State Univ., East Lansing, March 14–15, 2015.
Jointly organized with Michael Joyce (Tulane) and Miriam Logan (Bowdoin College).

- “Representation Theory and Applications, Yeditepe University”
Istanbul, Turkey (June 11–17, 2013).
Jointly organized with Kazım İlhan Ikeda (Yeditepe University) and Şafak Özden
- “Interactions Between Algebraic Combinatorics and Representation Theory”
2012 Spring AMS Southeastern Section Meeting,
Tampa, FL, March 10–11.
Jointly organized with Weiqiang Wang (U. of Virginia).
- “Workshop on Algebraic Monoids, Group Embeddings and Algebraic Combinatorics”
The Fields Institute, Toronto, ON. July 3–6, 2012.
Jointly organized with Zhenheng Li (U. of South Carolina),
Benjamin Steinberg (City College of New York), Qiang Wang (Carleton Uni.).
- “Rook Theory and Applications”
2012 Fall AMS Southeastern Section Meeting,
Tulane Univ., New Orleans, October 13–14.
Jointly organized with Michael Joyce (Tulane) and Jeff Remmel (UC San Diego).