

NÉSTOR FERNANDO DÍAZ MORERA

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🌐 <https://nmorera.github.io/diazmorera/>

RESEARCH INTERESTS

Representation theory of Algebraic Groups: Algebraic Coding Theory and Combinatorics.

APPOINTMENTS

- 2025 - Present 📅 **Fitchburg State University, Assistant Professor.**
2024 – 2025 📅 **Fitchburg State University, Visiting Assistant Professor.**

EDUCATION

- 2018 – 2024 📅 **Ph.D. Mathematics, Tulane University, USA.**
Thesis title: *Torus actions, spherical varieties, Dyck paths, and shellability.*
Advisor: Prof. Mahir Bilen Can.
- 2016 – 2018 📅 **M.S. Mathematics, Instituto Politécnico Nacional, México.**
Thesis title: *Q_p spaces on hyperbolic Riemann surfaces.*
Advisor: Prof. Luis M. Tovar Sánchez.
- 2010 – 2015 📅 **B.S. Mathematics, Universidad Sergio Arboleda, Colombia.**
Thesis title: *Complex structures on compact surfaces.*
Adviser: Prof. Leonardo A. Cano García.

PUBLICATIONS AND PREPRINTS

- 1 A. Bingham and N. F. Díaz Morera, “Lexicographic shellability of sects,” *Electron. J. Combin.*, vol. 32, no. 2, Paper No. 2.50, 20, 2025, ISSN: 1077-8926. 🔗 DOI: 10.37236/13631.
- 2 M. B. Can and N. Diaz Morera, “Nearly toric varieties of type A ,” *Turkish J. Math.*, vol. 49, no. 1, Art. 6, 65–95, 2025, ISSN: 1300-0098, 1303-6149. 🔗 DOI: 10.55730/1300-0098.3574.








TEACHING EXPERIENCE

Fitchburg State University

- 2025 - Present 📅 **Instructor of Record.** Math-1300 Precalculus (Fall and Spring), Math-2600 Linear Algebra (Fall and Spring), Math-1240 Calculus II (Spring).
- 2024 - 2025 📅 **Instructor of Record.** Math-1300 Precalculus (Fall and Spring), Math-1700 Applied Statistics (Fall), Math-2600 Linear Algebra (Spring), Math 3900 Math Seminar (Spring), Math-1800 Business Statistics (Summer).





TEACHING EXPERIENCE (CONTINUED)

Tulane University








- 2023 – 2024  **Instructor.** Math-1230, Statistics for Scientist (Fall and Spring).
- Summer '23  **Instructor.** Math-1110, Probability & Statistic I.
- 2022 – 2023  **T.A.** Math-1221 Calculus II (Spring), Math-1311 Consolidated Calculus I (Fall).
- Summer '22  **Instructor.** Math-1110, Probability & Statistic I.
- 2021 – 2022  **Instructor.** Math 1150 Long Calculus I (Spring). **T.A.** Math-3090 Linear Algebra (Fall).
- 2019 – 2021  **T.A.** Math-1230, Statistics for Scientist (Fall and Spring).
- 2018 – 2019  **T.A.** Math-1210 Calculus I (Fall), Math-2210 Calculus III (Spring).

CONFERENCES






Invited talks

- 2025  *Shellability of a Family of Symmetric Spaces.* AMS Special Session on *Interactions between geometry, combinatorics, and flag varieties*, Saint Louis University, Saint Louis, MO, USA (Oct 18-19).
- 2023  *Shellability of symmetric spaces and Bruhat orders.* SIAM Texas-Louisiana Sectional Meeting (SIAM TX-LA), University of Louisiana at Lafayette, LA, USA.
-  *Enumerating spherical Dyck paths and smooth nearly toric varieties.* Discrete Mathematics and Computer Sciences (DiscreteMath), Univesidad Nacional, Colombia (virtual).
-  *Spherical partition Schubert varieties and Dyck paths.* Southern Regional Algebra Conference (SRAC), Tulane University, New Orleans, USA.

Contributed talks

- 2024  *The Ubiquity of Pattern Avoidance.* MAA-NORTHEAST: NES/MAA, Bridgewater State University, MA, USA.
-  *Symmetric spaces and shellability.* CIMPA: VIII-Encuentro Colombiano de Combinatoria, Universidad del Cauca, Colombia.
- 2023  *Nearly toric Schubert varieties and Dyck paths.* 13th SE Lie Theory Workshop-NC State university (Combinatorial Representation Theory of Algebras and Applications), Raleigh, NC, USA.
-  *Dyck paths and nearly toric Schubert varieties.* CombinaTexas-TAMU (CombinaTexas), College Station, TX, USA.
-  *Dyck paths and nearly toric Schubert varieties.* Joint Mathematics Meetings (JMM), Boston, USA.
- 2022  *Ding and Schubert Varieties.* Congreso Nacional Sociedad Matemática Mexicana, Gaudalajara-México, (hybrid-video).
- 2018  *Q_p Spaces on Hyperbolic Riemann Surfaces.* Encuentro Sociedades de Matemáticas de Colombia y México, Barranquilla, Colombia.

Posters




- 2024  *Lexicographic shellability of sects.* Sagan2024, University of Florida, USA.
-  *Lexicographic shellability of sects.* CAAC, LACIM, Montréal, Canada.
- 2023  *Spherical Dyck paths.* Permutation Pattern 2023, University of Burgundy, Dijon, France.
-  *Nearly toric Schubert varieties and Dyck paths.* SLAM, University of North Texas, USA.
- 2022  *Spherical partition Schubert varieties.* PRIMA-2022, Vancouver, Canada.

OUTREACH AND SERVICE


Administration

- 2024-Present  **Seminar Committee** Member, Fitchburg State University, Fitchburg, MA, USA.
(Spring '25) Math Seminar for Undergraduate Minors/Majors, April 29th.
(Fall '24) Math Alumni Panel, October 28th.
- 2021-2023  **Curriculum Committee** Member, Fitchburg State University, Fitchburg, MA, USA.
 Volunteer in Math For All, a conference on Math Education and Research, Tulane University, New Orleans, USA.
- 2021-2022  President of AMS Student Chapter, Tulane University, LA, USA.

Undergrad research trainees


- 2025- Present  Rojanji Nova and Charles Stevenson, *Error Correction Meets Post-Quantum Security: A Study of Lattice-Based Cryptography*, Fitchburg State University, Fitchburg, MA, USA.
- 2023- Present  Heiner Jeshua Enciso Gaona, *PostQuantum Crypto*, Universidad Sergio Arboleda, Bogotá D.C., Colombia (Coadvised with Dr. Diego Villamizar).
- 2020-2021  Alexander Caione, *Introduction to Algebraic Actions*, Tulane University, New Orleans, USA.

Supervision of Undergraduate Students




- 2023-2025  Henry Mauricio Cañón Cortés, *Quantum Coding Theory*, Universidad Sergio Arboleda, Bogotá D.C., Colombia, *Honors Thesis*, (Coadvised with Dr. Diego Villamizar).

MISCELLANEOUS EXPERIENCE

Awards & Fellowships

- 2025  **Project NExT Fellow, Orange '25 Cohort**, Mathematical Association of America (MAA).
 **Travel Grant** for Graduate Workshop on Linear Algebra over Finite Fields & Applications, ICERM, Providence, RI, USA.
 **Open Educational Resources Grant** for MATH-2600 course, Fitchburg State University.
 **Falcon Scholars Undergraduate Research Assistance: Error Correction Meets Post-Quantum Security: A Study of Lattice-Based Cryptography**, Fitchburg State University. Joint research with students *Rohanji Novas* and *Charles Stevenson*.
- 2024  **Travel Grant** for Collaborate@ICERM: Structures Of The Weak Order, Providence, RI, USA.
 **Open Educational Resources Grant** for MATH-1300 course, Fitchburg State University.
 **Department Prize for Best Teaching Performance**, Tulane University.
 **Travel Grant** for ECCO, Universidad del Cauca, Cauca, Colombia.
- 2023  **Travel Grant** for Schubert Summer School @ UIUC, Champaign, IL, USA.
 **AMS Travel Grant** for Joint Mathematics Meetings (JMM), Boston, MA, USA.
- 2021  **Travel Grant** for Mathematical Sciences Research Institute (MSRI): Gauge Theory in Geometry and Topology (Virtual School).
 **Summer Research Support** from the department of Mathematics, Tulane university.
- 2016  **Scholarship** from The National Council for Science and Technology (CONACYT). Master's studies at IPN-México (2016-2018).

SKILLS

Languages  English, Spanish (native).
Coding  Familiar with Python and SAGE.
Hobbies  Running, football, cycling, and cooking.

REFERENCES

Prof. Mahir B. Can,
Tulane University,
mcan@tulane.edu

Dr. Daniel I. Bernstein,
Tulane University,
dbernstein1@tulane.edu

Prof. Michael Joyce (teaching),
Tulane University,
mjoyce3@tulane.edu

Prof. Catherine Buell,
Fitchburg State University,
cbuell1@fitchburgstate.edu

Prof. Peter Staab (teaching),
Fitchburg State University,
pstaab@fitchburgstate.edu