MOHAMAD NABIL NASSER



- **Born on**: 17/08/1990
- **Nationality**: Lebanese
- **Address**: Lebanon – Aramoun
- **University**: Beirut Arab University
- **Faculty**: Science
- **Department**: Mathematics & Computer Science
- **Current Position**: Assistant Professor
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Education

1. 2016-2022: Ph.D. in Pure Mathematics (Algebra), from Beirut Arab University, under the supervision of the Chairperson of the Department of Mathematics & Computer Science, Professor Mohammad N. Abdulrahim. The research focused on Representation Theory, with particular emphasis on the irreducibility, faithfulness, and unitarity of representations, including braid-related and generalized algebraic structures. This work resulted in four publications in international journals (listed below). Throughout the Ph.D., advanced techniques in abstract algebra and linear representations were developed. Upon request, the thesis and an executive summary are available.
2. 2014: Master 2 in Discrete Mathematics and Algebra from Lebanese University, under the supervision of Professor Amine El-Sahili. We studied claws in digraphs within the field of Graph Theory. Our task was to extend Sak and Sos' theorem, which states that any claw of order k can be found in any $2k-2$ chromatic digraph. We expanded its meaning to encompass any in-branching tree of order k.
3. 2013: Master 1 in Pure Mathematics from Lebanese University. Coursework covered advanced topics i n Algebra, Analysis, and Topology.
4. 2009-2012: Bachelor of Science in Mathematics from Lebanese University.

Work Experience

1. Teaching:
   a. Taught Mathematics in various high schools (2016-2020).
   b. Taught Mathematics for the SAT program (2016-2023).
   c. Part-timer Mathematics instructor, Faculty of Science, Beirut Arab University (2019-2025).
   d. Assistant professor of Mathematics, Faculty of Science, Beirut Arab University (2025-Present).
      - Foundation and Freshman courses:
        - ✓ MATH 110: Introduction to Calculus and Analytic Geometry I.
        - ✓ MATH 111: Introduction to Calculus and Analytic Geometry II.
        - ✓ MATH 112: Introduction to Algebra.
        - ✓ MATH 113: Fundamentals of Statistics.
      - Undergraduate courses:
        - ✓ BMTH 201: Business Math *(Business Administration).*
        - ✓ BMTH 202: Business Statistics *(Business Administration).*
        - ✓ MATH 241: Calculus and Analytic Geometry.
        - ✓ MATH 242: Probability and Statistics.
        - ✓ MATH 244: Ordinary Differential Equations.
        - ✓ MATH 246: Real Analysis I.
        - ✓ MATH 281: Linear Algebra *(Engineering).*
        - ✓ MATH 282: Calculus *(Engineering).*

- ✓ MATH 283: Differential Equations *(Engineering).*
- ✓ MATH 341: Linear Algebra.
- ✓ MATH 343: Special Functions.
- ✓ MATH 346: Abstract Algebra I.
- ✓ MATH 348: Numerical Methods.
- ✓ MATH 352: Number Theory.
- ✓ MATH 353: Set Theory.
- ✓ MATH 441: Introduction to Complex Analysis.
- ✓ MATH 456: Advanced Topics in Mathematics.

- Graduate courses:
  - ✓ INSS 602: Applied Statistics *(Business Administration).*
  - ✓ MATH 645: Applied Statistics *(Health Sciences).*
  - ✓ MATH 741: Homological Algebra.
  - ✓ STAT 603: Probability and Statistics.
  - ✓ STAT 605: Statistical Computing.
  - ✓ STAT 606: Statistical Programming.

2. Training and Facilitating:
   a. Designed and facilitated various courses related to personality and career building, for example, Time management, Smart reading & Notetaking, and Problem-solving (2016-2025).
   b. Certified trainer in the "Arabian Global Academy for Training and Development" (2016-2017).
   c. Certified trainer at "Skills Development Institute" (2016-2023).

Research & Publications

My research currently focuses on "Representation Theory". I work especially with representations of Braid Groups, Pure Braid Groups, and their generalization and extensions. The following is the list of publications starting in 2020. The first four publications were done during the Ph.D. journey.

1. M. N. Nasser and M. N. Abdulrahim, "On the composition of the Perron-Vannier representation and the natural map $P_n \to P_{2n}$", *International Journal of Applied Mathematics*, 33 (1), 125-136, **(2020).** Link to the paper.
2. M. N. Nasser and M. N. Abdulrahim, "On the irreducibility of the extensions of Burau and Gassner representations", *ANNALI DELL'UNIVERSITÀ DI FERRARA*, 67, 415-434, **(2021).** Link to the paper.
3. M. N. Nasser and M. N. Abdulrahim, "On the faithfulness of the extension of Lawrence-Krammer representation of the group of conjugating automorphisms C_3", *The Journal of Indian Mathematical Society*, 90 (3-4), 309-318, **(2023).** Link to the paper.
4. M. N. Nasser and M. N. Abdulrahim, "The irreducibility of the complex specialization of Lawrence-Krammer representation of P_4 on the band generators", *The Indian Journal of Mathematics*, 65 (1), 117-133. **(2023).** Link to the paper.
5. M. N. Nasser, R. G. Abou Nasser Al Yafi, and M. N. Abdulrahim, "Irreducible representations of the group of conjugating automorphisms

of a free group", *International Journal of Applied Mathematics*, 37 (5), 532-537, **(2024).** Link to the paper.

6. M. N. Nasser, "Necessary and sufficient conditions for the irreducibility of a linear representation of the braid group B_n", *Arabian Journal of Mathematics*, 13, 333-339, **(2024).** Link to the paper.
7. M. N. Nasser, "The faithfulness of an extension of Lawrence-Krammer-Beigelow representation of the group of conjugating automorphisms C_n in the cases $n = 3$ and $n = 4$", *BAU Journal of Science and Technology*, 6 (1), Article 1, **(2024).** Link to the paper.
8. M. N. Nasser, "A note on the faithfulness of the evaluated Gassner representation of the pure braid group", *International Journal of Applied Mathematics*, 38 (3), 403-410, **(2025)**. Link to the paper.
9. M. N. Nasser, "Local extensions and Φ -type extensions of some Local representations of the braid group B_n to the singular braid monoid SM_n", *Vietnam Journal of Mathematics*, 54, 737-748, **(2026)**. Link to the paper.
10. M. N. Nasser, "On the faithfulness of a family of representations of the singular braid monoid SM_n", *Beiträge zur Algebra und Geometrie/Contributions to Algebra and Geometry*, 67, 173-182, **(2026)**. Link to the paper.
11. T. I. Mayassi and M. N. Nasser, "Classification of homogeneous local representations of the singular braid monoid", *Arabian Journal of Mathematics*, 15, 307-329, **(2026)**. Link to the paper.

12. M. N. Nasser, “Attacks on local representations of the virtual and the welded braid groups”, *ANNALI DELL'UNIVERSITÀ DI FERRARA*, 72, 17, (2026). Link to the paper.
13. M. N. Nasser, “Insights on the homogeneous 3-local representations of the twin groups”, *Journal of Prime Research in Mathematics,* 22, 1, 104-119, (2026). Link to the paper.
14. M. N. Nasser, “A note on extending the Wada representations of the braid group to the singular braid monoid”, *Rendiconti del Circolo Matematico di Palermo Series 2*, 75, 79, (2026). Link to the paper.
15. M. N. Nasser, T. I. Mayassi, and N. Chbili, “Attacks on Fox's trapezoidal conjecture”, *Vietnam Journal of Mathematics,* (2026). Link to the paper.
16. M. N. Nasser, M. Y. Chreif, and M. M. Dally, “Local representations of the flat virtual braid group”, *Indian Journal of Pure and Applied Mathematics,* (2026). Link to the paper.
17. J. N. Zeineddine, M. N. Nasser, and M. N. Abdulrahim, “Discreteness of specializations of Wada representations and Gassner representation”, *Rendiconti del Circolo Matematico di Palermo Series 2*, 75, 144, (2026). Link to the paper.
18. M. N. Nasser, “Irreducibility of representations of virtual and welded braid groups”, *Rendiconti del Circolo Matematico di Palermo Series 2*, 76, 4, (2027). Link to the paper.
19. M. N. Nasser, V. Keshari, and M. Prabhakar, “Matrix representations of the twisted virtual braid group and its extensions”, submitted.
20. M. N. Nasser, “On circular braid group representations”, submitted.

21. M. N. Nasser, “On the irreducibility of singular braid group representations”, submitted.
22. M. N. Nasser, “On extensions of the standard representation of the braid group to the singular braid group”, submitted.
23. R. S. Kahil and M. N. Nasser, “Extensions of twin group representations to the singular twin monoid”, submitted.
24. M. N. Nasser, “Twin groups representations”, submitted.
25. V. Keshari, M. N. Nasser, and M. Prabhakar, “On representations of the multi-virtual braid group M_kVB_n and the multi-welded braid group M_kWB_n”, submitted.
26. T. I. Mayassi and M. N. Nasser, “On the classification and irreducibility of 2-local representations of the twin group T_n”, submitted.
27. M. Y. Chreif, M. M. Dally, and M. N. Nasser, “On matrix representations of the virtual singular braid monoid”, submitted.
28. M. N. Nasser and N. Chbili, “Algebraic and topological aspects of the singular twin group and its representations”, submitted.
29. C. Caprau and M. N. Nasser, “The virtual singular twin monoid and group: presentations and representations”, submitted.
30. M. N. Nasser and T. I. Mayassi, “Towards a study of low-dimensional matrix representations of the cactus group”, submitted.
31. M. N. Nasser, “Representations of the pure braid groups P_n derived from local representations of the braid groups B_n”, submitted.
32. M. N. Nasser, N. Chbili, and K. Qazaqzeh, “On representations of the triplet group and some of its extensions”, submitted.

33. M. N. Nasser, “Constructing high-dimensional representations of twin groups via several techniques”, submitted.
34. M. N. Nasser and Oscar Ocampo, “On universal virtual and welded braid groups and their linear representations”, submitted.
35. V. Keshari, T. Mayassi, M. Prabhakar, and M. N. Nasser, “Presentations and representations of the multi-virtual twin group and associated subgroups”, submitted.
36. Rawia A. Jinani, M. N. Abdulrahim, and M. N. Nasser, “Towards the faithfulness of the reduced Burau representation of B_4”, submitted.
37. J. N. Zeineddine, M. N. Abdulrahim, and M. N. Nasser, “On the irreducibility of the representation of the flat virtual braid group”, submitted.
38. M. N. Nasser and R. Kahil, “From the braid group to the monoid of singular braids: extending prominent representations”, submitted.
39. M. N. Nasser and O. Ocampo, “Multi-welded twin groups”, submitted.
40. C. Caprau and M. N. Nasser, “On the structure of the singular triplet monoid and its virtual extension”, submitted.
41. M. Y. Chreif, M. M. Dally, and M. N. Nasser, “Extensions of braid representations to the universal braid group”, submitted.
42. R. S. Kahil and M. N. Nasser, “Extending Wada representations to the framed braid group: construction and properties”, submitted.

Collaborators

1. Prof. Mohammad Abdul Rahim – Beirut Arab University – Lebanon.

Email: mna@bau.edu.lb

2. Prof. Carmen Caprau - California State University, Fresno - USA.

   Email: ccaprau@csufresno.edu

3. Prof. Nafaa Chbili – United Arab Emirates University – UAE.

   Email: nafaachbili@uaeu.ac.ae

4. Dr. Oscar Ocampo – Federal University of Bahia – Brazil.

5. Email: oscaro@ufba.br

6. Dr. Madeti Prabhakar – Indian Institute of Technology Ropar – India.

   Email: prabhakar@iitrpr.ac.in

7. Dr. Khaled Qazaqzeh – Yarmouk University – Jordan.

   Email: qazaqzeh@yu.edu.jo

8. Dr. Malak Dally – Beirut Arab University – Lebanon.

   Email: m.dalla@bau.edu.lb

9. Dr. Taher Mayassi – Lebanese International University – Lebanon.

   Email: taher.mayasi@liu.edu.lb

10. Dr. Mohamad Chreif – Lebanese International University – Lebanon.

    Email: mohamad.chreif@liu.edu.lb

Graduate Students

1. Jihan Zeineddine (Ph.D.): "On the Generalizations of Artin Braid group and Temperley-Lieb Algebra" (With Prof. M. N. Abdulrahim).

Reviewing[1]

1. Reviewer in zbMATH open **(Since 2023)**.

2. Reviewer in the American Mathematical Society **(Since 2025)**.
3. Reviewer in “Mathematics and Statistics - ISSN: 2332-2071” **(Since 2025)**. Publisher: Horizon Research Publishing.
4. Reviewer in “Journal of Statistics Applications and Probability - ISSN: 2090-8423” **(Since 2025)**. Publisher: Natural Sciences Publishing.
5. Reviewer in “Journal of Prime Research in Mathematics - ISSN: 18173462" **(Since 2026)**. Publisher: Abdus Salam School of Mathematical Sciences.

Links & Resources

1. LinkedIn.
2. Google Scholar.
3. Orcid.
4. Research Gate.
5. Scopus.

Committees

1. Member of the Faculty of Science Council at Beirut Arab University (BAU) **(2024-2025)**.
2. Member of the Scientific Committee of the Lebanese Society for the Mathematical Sciences (LSMS) **(2025)**.

3. Head of the Student Activities Committee in the Faculty of Science at Beirut Arab University (BAU) (2025-2026).
4. Head of the Organizing Committee of the Math Competition for Schools in Lebanon (MCSL) (2026).
5. Head of the Organizing Committee of the conference: Representation Theory and Related Algebraic & Geometric Structures (2026).
6. Member of the Research Programs Committee at Beirut Arab University (BAU) (2026-2027).
7. Member of the Research Committee in the Faculty of Science at Beirut Arab University (BAU) (2026-2027).

Activities & Conferences

1. 2016: Participated in a workshop on Mathematical Analysis at Beirut Arab University.
2. 2017: Successfully completed a Training of Trainers (TOT) program with the Arabian Global Academy for Training and Development.
3. 2019: Attended the Ninth Annual Meeting of the Lebanese Society for the Mathematical Sciences (LSMS), held at the Doctoral School of Science and Technology, Lebanese University – Fanar Campus.
4. 2023: Participated in the Doctoral Studies National Research Days at the Holy Spirit University of Kaslik.
5. 2024: Attended a seminar entitled “Representation of Some Infinite Groups Using Diagrams” at Beirut Arab University.
6. 2024: Attended the Eleventh Annual Meeting of the Lebanese Society for the Mathematical Sciences (LSMS) at Notre Dame University – Louaize.

7. 2025: Delivered an invited talk at the Twelfth Annual Meeting of the Lebanese Society for the Mathematical Sciences (LSMS), held at the American University of Beirut, entitled “Local extensions and Φ-type extensions of some local representations of the braid group $B_n$to the singular braid monoid SM_n”.
8. 2025: Delivered an online talk at the ISIM & ISWIM Conference, hosted by the National University of Science and Technology POLITEHNICA Bucharest, entitled “Representations of the braid group and their extensions to the singular braid monoid.”
9. 2025: Delivered an online invited talk at the Knots and Related Topics Conference, held at the Indian Institute of Technology Ropar, entitled “A note on extending the Wada representations of the braid group to the singular braid monoid.”
10. 2026: Delivered an online talk at a workshop entitled “Representation Theory and Related Algebraic & Geometric Structures”, hosted by Beirut Arab University, entitled “On representations of the triplet group and some of its extensions”.

Achievements

1. 2026: Awarded the “Research Moral Incentive Award” for being among the most active researchers at the Faculty of Science during the academic year 2024–2025, Beirut Arab University.

Skills

1. Languages:

a. Arabic: mother language.
b. English: very good.

2. Computer and Internet Skills:
   a. Microsoft Office: Outlook, Word, PowerPoint, Excel.
   b. Cloud and Online Collaboration: OneDrive, Microsoft Teams, Google Drive, Google Meet, Zoom.
   c. Scientific and Programming tools: LaTeX, Overleaf, Mathematica, Maple, SPSS, Python, R Language.
3. Personal Skills:

a. Teaching	b. Training	c. Facilitating
d. Researching	e. Teamwork	f. Public speaking
g. Class management	h. Education management	i. Time management
j. Preparing lessons	k. Communication skills	l. Problem-solving

Teaching Statement

Since every student is different, they should all have a welcoming and supportive learning environment where they can develop intellectually, emotionally, physically, and socially.

"Individualization" refers to the educational concept of attending to each student individually. My goal is to establish an environment where students can reach their potential. In addition, I try to create a secure space where students feel comfortable sharing their thoughts.

Furthermore, against trendy belief, teaching mathematics involves more than merely imparting rules and theories; it involves deeper thinking. If a math instructor could "discuss" math with his students rather than simply impart the material, I believe he may succeed in his teaching style.

However, the teacher is now just one of several tools available to the students. These days, any student has easy access to any information. This means the instructor should facilitate knowledge transfer and create a supportive learning environment for each student.

Research Statement

Without research, the world would not be better; research is the foundation for all inventions. Only some people are cut out to be researchers. Patience, persistence, and passion are required for research.

I make it a point to work on open problems as I go through my research process. Under the guidance of my Ph.D. advisor, Professor Mohammad N. Abdul Rahim at Beirut Arab University, I completed four papers. After getting my Ph.D., I kept doing research and would dedicate most of my days to it.

Hobbies & Interests

1. Reading
2. Chess.
3. Football.
4. Meditation.
5. Swimming.
6. Table Tennis.

Recommendation Letters

1. 2012: Dr. Sami Hamieh, assistant professor in pure mathematics at Lebanese University.
2. 2012: Dr. Nidal Ali, associate professor in pure mathematics at Lebanese University.
3. 2012: Dr. Mohammad Hamieh, associate professor in pure mathematics at Lebanese University.
4. 2013: Dr. Hassan Abbas, associate professor in applied mathematics at Lebanese University.
5. 2014: Prof. Amine El-Sahili, full professor in pure mathematics at Lebanese University.
6. 2018: Prof. Mohammad Abdul Rahim, full professor in pure mathematics and chairperson of the Department of Mathematics and Computer Science at Beirut Arab University.

References

1. Prof. Mohammad Abdul Rahim, email: mna@bau.edu.lb