

Curriculum Vita

S E M R A Ö Z T Ü R K

Mathematics Department, Middle East Technical University,
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<http://users.metu.edu.tr/sozkap/>

September 16, 2025

BIRTH DATE/PLACE 1963/BURSA

EDUCATION

- 1995 **Ph.D.**, Mathematics, University of Wisconsin, Madison, WI, USA
Thesis title : *Local to Global Invariants for G-Modules and G-Spaces*
Thesis advisor : Prof. Amir Assadi
Major topics : Algebra; Algebraic Topology, Representation Theory, Group Theory
Minor : Computer Science
- 1994 **M.A.**, Mathematics, University of Wisconsin, Madison, WI, USA
- 1987 **M.S.**, Mathematics, Middle East Technical University, Ankara, Türkiye
Thesis title : *Existence of Normal Complements in Finite Groups*
Thesis advisor : Prof. İsmail Güloğlu
- 1985 **B.S.**, Mathematics, Middle East Technical University, Ankara, Türkiye
Includes English preparatory school (1980 – 1981)
- 1980 Chemistry Technical Lycée, Mehmet Rüştü Uzel Kimya Meslek Lisesi, Ankara, Türkiye

PROGRAMMING LANGUAGES

1982-85 Fortran, PL1

LANGUAGES

English : Fluent (Nov. 2025 - eKPDS 90pts)
French : Beginner
German : Beginner, learning currently

HONORS AND AWARDS

- 2013 Associate Professor, ODTÜ
- 2012 Performance Award, ODTÜ
- 2011 Associate Professor, ÜAK Doçent

- 2008 Partial Support from MSRI for participating at the Parent Program:
Representation Theory of Finite Groups and Related topics,
Homological Methods in Representation Theory, MSRI, Berkeley, CA, USA
- 2004 TÜBİTAK-NATO-B2 Postdoctoral Research Fellowship used at Univ. of Virginia,USA
- 1987 – 1991 TÜBİTAK-NATO-D scholarship for Ph.D. for abroad, used in U.S.A.
- 1987 Turkish Ministry of Edu. scholarship for Ph.D. for abroad declined in favor of the above
- 1985 – 1987 TÜBİTAK scholarship
- June 1985 Graduation with the second highest GPA in a class of 60 students
Mathematics Department, Middle East Technical University
- June 1978 Highest GPA in all chemistry technical lycées in Türkiye
- 1978 – 1980 Turkish Ministry of Education scholarship

EMPLOYMENT

- 2013 – **Associate Professor**, Mathematics Dept., Middle East Technical University, Ankara, Türkiye
Jan.7– 2011 **ÜAK Doçentlik Ünvanı**,
- 2005 – 2013 **Assistant Professor**, Mathematics Dept., Middle East Technical University, Ankara, Türkiye
- 2004 – 2005 **Visiting Faculty**, Mathematics Department., University of Virginia, Charlottesville, VA,U.S.A.
- 2001 – 2004 **Assistant Professor**, Mathematics Dept., Middle East Technical University, Ankara, Türkiye
- 1995 – 2001 **Instructor**, Mathematics Dept., Middle East Technical University, Ankara, Türkiye
- 1990 – 1995 **Teaching assistant**, Mathematics Dept., University of Wisconsin, Madison, WI, USA
- 1986 – 1987 **Teaching assistant**, Mathematics Dept., Middle East Technical University, Ankara, Türkiye
- Summer 1984 **Computer programmer** and sales representative, DecPort-Casio, Inc.,

PUBLICATIONS (all are single author, all, except 1.*, are in SCIE)

10. *On m -th Roots of Nilpotent Matrices*,
Electron. J. Linear Algebra **37**, November 2021 , 718–733.
9. *Jordan Types of Commuting Nilpotent Matrices*,
Commun. Korean Math. Soc. **33**, 2018 , No. 4, 1097–1102
8. *Restricted Modules and Conjectures for Modules of Constant Jordan Type*,
Algebras and Representation Theory **5**, 2014, 1437–1455
7. *p -Power Points and Modules of Constant p -power Jordan Type*,
Communications in Algebra **39**, 2011, 3781–3800
6. *Jordan type of a $k[C_p \times C_p]$ -module*,
New York J. Math. **17a**, 2011, 307–313
5. *Commuting Nilpotent Operators and Maximal Rank*,
Complex Anal. Oper. Theory **4**, 2010, 901–904
4. *Structure and Detection Theorems for $k[C_2 \times C_4]$ -modules*,

Rendiconti del Seminario Matematico della Università di Padova **123**, 2010 , 169–189

3. *Betti Numbers of Fixed Point Sets and Multiplicities of Indecomposable Summands*,
Journal of Australian Mathematical Society **74**, 2003, 165–171
2. *A Note on a Theorem of Dwyer and Wilkerson*,
Archiv der Mathematik **76**, 2001, 25–29
- 1.* *Equivalent Conditions for the Existence of Normal Complements*,
Int. Journal of Mathematics, Game Theory and Algebra **9**, 1999, no 4, 269–275

CITATIONS

For article 5 above : *On commutators of square zero Hilbert Space Operators* by Laurent W. Marcoux , Heydar Radjavi, and Yuanhang Zhang , *Canad. J. Math.* 2025, pp. 136
<http://dx.doi.org/10.4153/S0008414X24000750>

For article 4 and 7 above: [Book] *Representations of Elementary Abelian p-Groups and Vector Bundles*
DJ Benson - 2017 - books.google.com

For article 4 above: *2014 Finitely Generated Modules over Group Rings of a Direct Product of Two Cyclic Groups*, Ahmed Najim and Mohammed Elhassani Charkani Hindawi Publishing Corporation *Algebra* Volume 2014, Article ID 256020, 5 pages <http://dx.doi.org/10.1155/2014/256020>

THESES

Ph.D. Thesis, 1995, *Local to Global Invariants for G-Modules and G-Spaces*, supervised by Prof. Amir H. Assadi
M.S. Thesis, 1987, *Existence of Normal Complements in Finite Groups*, supervised by Prof. İsmail Güloğlu

PREPRINTS

3. *Asymptotes at infinity and praised functions as counterexamples*, 2021
2. *On F_p -Rational Structure of Nilpotent Cones in Classical Lie Algebras*, Joint with Brian Parshall and Bin Shu,
Preprint, 2011, <http://arxiv.org/pdf/math/0703527>
1. *A Restriction Theorem for $k[Z_2 \times Z_4]$ -modules to Spanned cyclic Subgroups and Multiplicities Set*
Preprint, 2002, Cited in *Generic and Maximal Jordan Types* by E. Friedlander, J. Pevtsova, A. Suslin,
Invent. Math. 168 (2007), 485–522.

RESEARCH INTERESTS

I am interested in modules over group algebras $k[G]$ where k is a field, in particular, of characteristic $p > 0$ and the group order is divisible by p , simply referred as Modular Representation Theory, and spaces with a G -action. Especially modules arising from G -actions on spaces, their restrictions to subalgebras of $k[G]$ and their interaction with the fixed point sets of the subgroups of the group acting on the space are among my main interests. Many of the rings coming out of groups such as the group ring, cohomology

ring, representation ring, character ring, Burnside ring together with their interactions are sources of excitement for me. In particular, I have work on modules of constant Jordan type, and proved some conjectures by Suslin, Rickard hold for a subclass of modules. Recently, I studied m -th roots of nilpotent matrices. I also had some work in algebraic topology at the beginning of my career but I did not proceed in that direction.

TEACHING

Undergraduate Courses:

- 1XX Fund.of Math., Basic Algeb.Structures, Analytic Geom., Calculus I, II, Calc.for Math.Students, Introduction to Number Theory
- 2XX Basic Linear Algebra, Linear Algebra I, II, Elementary Geometry,
- 3XX Abstract Algebra,
- 4XX Elementary Geometric Topology, Rings and Modules, Introduction to Group Theory, Introduction to Representation Theory

Graduate Courses:

- 5XX Algebraic Topology I, II
- 5XX Representation Theory of Finite Groups
- 7XX Homological Methods in Topology
- 7XX Homological Algebra

ADVISING

2005 – present **Advisor for Double Major and Minor Students** Mathematics Dept., O.D.TÜ.

SUPERVISING

M.S. Thesis by Sunay Doğan, 2024, Quantum Magic Squares in View of Birkoff-Von Meumann Theorem

CONFERENCES (Attendee/Speaker/Organizer)

- Sep. 1–4 2025 37. Ulusal Matematik Sempozyumu, Akdeniz Üniversitesi, Antalya, Türkiye
- July 14-17 2025 11. Halka Modül ve Cebir Çalıştayı, Bursa Teknik Üniversitesi, Bursa, Türkiye
- May 2 2024 Cahit Arf Conference 2025, Invitee : Geoge Lusztig, MIT, U.S.A., Orta Doğu Teknik Üniversitesi, Ankara, Türkiye
Organizer
- May 3-4 2024 TKMD IX. Çalıştay- 2024 İzmir Ekonomi Üniversitesi, Türkiye
Title of Talk : m -th Roots of Matrices Revisited
- May 2 2024 Cahit Arf Conference 2024, Invitee : David Harvey, UNSW -Sydney, Australia, Orta Doğu Teknik Üniversitesi, Ankara, Türkiye
Organizer
- April 27 2024 8. Cemal Koç Cebir Günleri, Hacettepe Üniversitesi, Ankara, Türkiye

- Oct 13 2022 Cahit Arf Conference 2022, Invitee : Andrew Sutherland, MIT, USA,
Orta Doğu Teknik Üniversitesi, Ankara, Türkiye
Organizer
- June 8 2022 Mimar Sinan Güzel Sanatlar Üniversitesi, Online Seminar, Türkiye
Title of Talk : m -th roots of nilpotent matrices
- May 2-3 2019 Group Theory in Ankara; in honour of Mahmut Kuzucuoğlu's 60th birthday,
O.D.T.Ü, Ankara, Türkiye
- April 27 2019 Cemal Koç Algebra Days 7, Ihsan Doğramacı Bilkent Üniversitesi, Ankara, Türkiye
- Apr.26-28 2019 6. TKMD Çalıştayı, Selçuk Üniversitesi, Konya, Türkiye
- April 24 2019 Dr. Emir Öngüner : DLR, göttingen, Germany, Cahit Arf'ı Anma Etkinliği:
Halide ve Cahit Arf'ın Almanya Mektupları, O.D.T.Ü. Ankara, Türkiye
Organizer
- Nov 29 2018 Cahit Arf Conference 2018, Invitee : Fernando Rodriguez Villegas, ICTP, Italy,
Orta Doğu Teknik Üniversitesi, Ankara, Türkiye
Organizer
- Sep 12-15 2018 31. Ulusal Matematik Sempozyumu, Bin Ali Yıldırım Üniversitesi, Erzincan, Türkiye
- July 20-24 2018 New Trends in Rings and Modules I, Gebze Teknik Üniversitesi, Kocaeli, Türkiye
- Nov 4 2016 TKMD, Kadın ve Bilim IV, Atılım Üniversitesi, Ankara, Türkiye
Title of Talk : A glimpse of representation theory
- Apr 4 2015 Cemal Koç Cebir Semineri III, Gebze Teknik Üniversitesi, Gebze, Türkiye
Title of Talk : Conjectures on modules of constant Jordan type
- May 2-4 2014 Birinci TKMD Çalıştayı, Gebze Yüksek Teknoloji Enstitüsü, Gebze, Türkiye
- May 2013 Antalya Algebra Days XV, Şirince, İzmir, Türkiye
Title of Talk : Betti numbers of fixed point sets and conjectures for mod.of const.Jordan type
- Feb 4-8 2013 Second Biennial International Group Theory Conference, Doğu Üniversitesi, İstanbul, Türkiye
Organizer and speaker
Title of Talk : Restricted Modules and Conjectures for Modules of Constant Jordan type
- Nov. 2012 Cahit Arf Conference 2012, Invitee : David E. Nadler from U.California, Berkeley, CA, USA,
Orta Doğu Teknik Üniversitesi, Ankara, Türkiye
Organizer
- Oct. 18-21 2012 ICAAM 2012 First International Conference on Applied Mathematics and Operator Theory,
Gümüşhane Üniversitesi, Gümüşhane, Türkiye
Title of Talk : Commuting Nilpotent Operators with Maximal Rank
- July27-Au.5 2012 Cohomology and Support in Representation Theory and Related Topics, UW-Seattle, USA
Title of Poster : Modules of Constant Jordan Type and Related Conjectures
- May31-Jn1 2012 Ankara Matematik Günleri 7, Bilkent, Ankara, Türkiye
Title of Talk: Suslin ve Rickard'ın Sabit Jordan Jordan Tipli Modüller Hakkındaki Öngörülere
- Nov. 24, 2011 Cahit Arf Conference 2011, Invitee : Jonathan Pila from Math.Inst., University of Oxford, UK,
Orta Doğu Teknik Üniversitesi, Ankara, Türkiye
Organizer

- June 7–11 2011 International Conference; Finite Groups and Their Automorphisms, IMBM and Boğaziçi Üniversitesi, İstanbul Türkiye
Organizer
- Mar 22-26 2010 Recent Advances in operator theory, organized by State Univ. of New York at Albany, USA and Puerto Rico University-Mayaguez, Rincon, PR, USA
Title of Talk : Commuting Nilpotent Operators and Maximal Rank
- July 5–5 2010 Algebra Workshop II in Honor of Cemal Koc., IMBM, Boğaziçi Üniversitesi, İstanbul Türkiye
Title of Talk : p -Power points an modules of constant Jordan type
- June 19 2009 Algebra Workshop, IMBM, Boğaziçi Üniversitesi, İstanbul Türkiye
Title of Talk : Automorphism of groups and group extensions
- June 4-5 2009 4. Ankara Matematik Günleri Sempozyumu, Orta Doğu Teknik Üniversitesi, Ankara, Türkiye
Title of Talk : p -Power Points and Modules of Constant p -power Jordan Type
- March 25 2009 Mathematics Department, Bilkent University, Ankara, Türkiye
Title of Talk : p -Power Points and Modules of Strongly Constant Jordan Type
- Aug 18-22 2008 International Conference on Ring and Module Theory, Hacettepe Üniversitesi, Ankara, Türkiye
Title of Talk : p -Power Points and Modules of Strongly Constant Jordan Type
- May 22-23 2008 3. Ankara Matematik Günleri Sempozyumu, Ankara Üniversitesi, Ankara, Türkiye
Title of Talk : p -Power Points and Modules of Strongly Constant Jordan Type
- Mh31-Ap4,2008 MSRI, Parent Program:Representation Theory of Finite Groups and Related topics, Homological Methods in Representation Theory, Berkeley, CA, USA
Partially supported by MSRI
- March 25 2007 Mathematics Department, Bilkent University, Ankara, Türkiye
Title of Talk : p -Power Points and Modules of Strongly Constant Jordan Type
- May 22-27 2007 Antalya Algebra Days IX, Antalya, Turkey
Title of Talk : Modules of Uniform Jordan Type
- Ap29-May1,2007 University of Bielefeld, Bielefeld, Germany
Representations, Cohomology and Support Spaces
- Dec. 9 2006 Topoloji Günü, Atılım Üniversitesi, Matematik Bölümü,
Title of Talk: Localization in Cohomology
- May 23-25.2005 Institute of Advanced Study, Womens Program 2005,
Groups and Geometry, Princeton, NJ, USA
- May 20-21 2005 Conference in Honor of R.L. Wilson and J. Lepowsky,
Lie Algebras , Vertex Operator Algebras, and Their Applications, NCSU, NC, USA
- May 17,19 2005 Operator Theory Seminar, Mathematics Dept. University of Virginia, Charlottesville, VA, USA
Title of Talk : Extensions of C^* -algebras I , II
- Mar.25 2005 Colloquium, Galludet University, Washington DC, USA
Title of Talk : Localization and Fixed Point Sets
- Feb.11 2005 Colloquium, Georgia Southern University, Statesboro, Georgia, USA
Title of Talk: Betti Numbers of Fixed Point Sets
- Jan. 5-9 2005 Joint Mathematics Meeting, Atlanta, USA

- Nov.15-17 2004 Algebra Seminar, Mathematics Dept., University of Georgia, Georgia, USA
Title of Talk : On Modular Representations of Abelian p -groups of Small Rank
- Sep.16-19 2004 Algebraic Cycles, K-Theory, and Modular Representation Theory in Honor of
E. Friedlander's 60'th bithday, Northwestern University, Chicago, USA
- Oct. 14 2004 Mathematics Dept. University of Virginia, Charlottesville, VA, USA
Title of Talk : Betti Numbers of Fixed Point Sets and Multiplicities of Indecomp. Summands
- Oct. 6 2004 Mathematics Dept. University of Virginia, Charlottesville, VA, USA
Title of Talk: A Detection Theorem for $Z_2 \times Z_4$ -modules
- July 2004–2005 Visiting Faculty Member, Mathematics Department, University of Virginia , Charlottesville, USA
- April 2 2003 Gazi Algebra Day, Gazi Üniversitesi, Ankara, Türkiye
- Sept.20-23 2002 Int. Conference on the Hilbert-Smith conjecture, İstanbul Bilgi Üniversitesi, İstanbul, Türkiye
Title of Talk : Betti Numbers of Fixed Point Sets and Multiplicities of Indecomp. Summands
- June7-13 2002 AMS-IMS-SIAM, Summer Research Institute, Groups, Representations and Cohomology
Mount Holyoke College, South Hadley, MA, USA
- May21-26 2002 Antalya Cebir Günleri IV, Antalya, Türkiye
- March25 2002 Bilkent Cebir Günü, Ankara, Türkiye
- June25-29 2001 Workshop on Singularity Theory, Feza Gürsey Enstitüsü, İstanbul, Türkiye
- March 2001 Bilkent Cebir Günleri, Bilkent, Ankara, Türkiye
- May17-21 2000 Antalya Cebir Günleri II, Antalya, Türkiye
Title of Talk: Existence of Normal Complements
- May18-23 1999 Antalya Cebir Günleri, Antalya, Türkiye
Title of Talk: Multiplicities of Indecomposable Summands
- May-June 1998 Workshop on Low-dimensional Topology, METU, Türkiye
- July 1997 International Workshop on Number Theory, METU, Türkiye
- July 1996 AMS, Summer Research Institute, Cohomology Representations and
Actions of Finite Groups, University of Washington-Seattle, WA, USA
Title of Talk : Numerical Invariants for G -Modules
- May 1996 5-th Gökova Geometry- Topology Conference, Muğla, Türkiye
- November 1996 Mathematics Symposium Held for the 85 th Birthday of Emeritus Professor
Cahit Arf, İstanbul Technical University, İstanbul, Türkiye
- October 1996 Mathematics Department, Bilkent University, Ankara, Türkiye
Title of Talk : Localizations in the Equivariant Cohomology of G -Spaces
- August 1995 Mathematics Department, The University of Chicago, Chicago, IL, USA
Title of Talk : An Extension of Dwyer-Wilkerson's Theorem on the Unstable
Part of the Localized Equivariant Cohomology Ring of a G -Space
- June 1994 3rd International Workshop on Geometry and Arithmetic, Antalya, Türkiye
Title of Talk: G -Modules, G -Spaces, and Betti Numbers
- August 1993 International Center for Theoretical Physics, Trieste, Italy
- August 1992 International Workshop on Arithmetic Number Theory, ICTP, Trieste, Italy

July 1992 1st International Workshop on Geometry and Arithmetic, Antalya Türkiye
June 1992 Algebraic Topology and Geometric Topology, Northwestern University, Evanston, IL, USA
May 1992 AMS Joint Meeting on Cohomology of Groups and its Relation to Algebraic
Topology, Mount Holyoke College, Mount Holyoke, MA, USA
January 1991 AMS Annual Meeting, Baltimore, MD, USA

REFERENCES

Prof. Amir H. Assadi Math. Dept., Univ. of Wisconsin, Madison, WI 53706 USA
Prof. Gülin Ercan Math. Dept., Middle East Technical Univ., Ankara 06800 Türkiye
Prof. İsmail Gülođlu Dođuş Üniversitesi, İstanbul, 34722, Türkiye
Prof. Turgut Önder Math. Dept., Middle East Technical Univ., Ankara 06800 Türkiye
Prof. Ergün Yalçın Math. Dept. Bilkent Univ. Ankara, 06800, Türkiye
Prof. Steve Bauman Math. Dept., Univ. of Wisconsin, Madison, WI 53706 USA

REFEREEING

2022 MEB-TTK Taslak Kitap İnceleyici
2014 TÜBİTAK 1001 Proje Hakemliđi
2005 Gazi Üniversitesi Journal of Science
2004 NSF Post Doctoral Fellowships
2002 Anadolu Üniversitesi Bilim ve Teknoloji Dergisi