

CONTACT
INFORMATION

Izmir Institute of Technology
 Department of Mathematics
 Office No: 208
 Gülbahçe Campus
 Izmir, Turkey
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 Website: www.nesligugumcu.weebly.com

RESEARCH
INTERESTS

Low-dimensional topology, knot theory and its applications in biology, physics and chemistry, theory of knotoids, quantum topology, graph theory.

EDUCATION

National Technical University of Athens December 2013 - February 2018
 Ph.D. in Mathematics
 • Dissertation: *On Knotoids, Braidoids and Their Applications*
 • Supervisor: Sofia Lambropoulou
 • Committee: L.H.Kauffman, V.Turaev, S.Nelson, D.Kodokostas, O.Pashaev, P. Bellingeri

Middle East Technical University, Turkey
 M.S. in Mathematics with High Honors January 2008- June 2010
 B.S. in Mathematics with Honors September 2003- January 2008

APPOINTMENTS

- Assistant Professor,
 Izmir Institute of Technology, Department of Mathematics October 2019- ...
- Postdoctoral Fellow,
 Georg-August Universität, Göttingen January 2020- July 2022
- Postdoctoral Fellow,
 Oberwolfach Research Institute of Mathematics August-September 2019
- Adjunct Professor,
 Izmir University of Economics, Department of Mathematics Jun 2018- December 2018
- Research Fellow,
 Department of Mathematics, National Technical University of Athens 2013-2015
- Teaching Assistant,
 Koç University Department of Mathematics, İstanbul Turkey 2010-2013
- Research and Teaching Assistant,
 Başkent University, Department of Education of Mathematics, Ankara Turkey 2008-2010

- Undergraduate Teaching Assistant,
Middle East Technical University
Department of Mathematics, Ankara Turkey

2007-2008

PUBLICATIONS & PREPRINTS

- 1. New invariants of knotoids**
With L. H. Kauffman,
European Journal of Combinatorics 65C, 2017, pp. 186-229
- 2. On the height of knotoids**
With L. H. Kauffman,
Springer Proceedings in Mathematics & Statistics (PROMS) Book Title: Algebraic Modeling of Topological and Computational Structures and Applications, 219, 2017
- 3. Topological models for knotted bonded open protein chains using the concept of knotoids and bonded knotoids**
With D. Goundaroulis, S. Lambropoulou, J. Dorier, A. Stasiak and L. H. Kauffman,
Polymers 9(9), 2017
- 4. Knotoids, braidoids and applications**
With S. Lambropoulou,
Symmetry, 9(12), 315, 2017 , Special Issue: Knot Theory and Its Applications
- 5. Biquandle coloring invariants of knotoids**
With S. Nelson,
Journal of Knot Theory and its Ramifications, Vol.28, No. 04, 2019
preprint: ArXiv <https://arxiv.org/abs/1803.11308>
- 6. What is a braidoid?**
Invited chapter in the refereed book: ‘A Concise Encyclopedia of Knots’, CMC Press, 2020
Editors: Colin Adams, Erica Flapan, Louis Kauffman, Lew Ludwig, Sam Nelson, Allison Henrich
- 7. Braidoids**
With S. Lambropoulou, Oberwolfach Preprints; 2020,17, DOI: 10.14760/OWP-2020-17
- 8. Braidoids**
With S. Lambropoulou, Israel Journal of Mathematics. 242, 955â995 (2021). <https://doi.org/10.1007/s11856-021-2155-8IsraelJournalofMathematics>
- 9. Biquandle Brackets and Knotoids**
With S.Nelson and N.Oyamaguchi, Journal Knot Theory and its Ramifications,, Vol.30, No:09, 2021
- 10. Quantum invariants of knotoids**
With L. Kauffman, Communications in Mathematical Physics. (2021). <https://doi.org/10.1007/s00220-021-04081-3>
- 11. Parity, closure and minimality of knotoids**
With L.Kauffman, Journal of Knot theory and its Ramifications, Vol.30, No:11, 2021

12. **Invariants of bonded knotoids and applications to protein folding**
Invited paper, with B.Gabrovsek and L.Kauffman, to appear in Symmetry, Special Issue: Topological Methods in Chemistry and Molecular Biology, 2021
13. **Invariants of multi-linkoids**
With Bostjan Gabrovsek, under review
14. **k-color Region select game**
With A.Batal, under review

RESEARCH
FELLOWSHIPS &
AWARDS

2020-2022 Dorothea Schloezer Postdoctoral Program for Female Scientists, Georg-August Universität, Göttingen

2019 Leibniz Fellows by Oberwolfach Research Institute for Mathematics, Oberwolfach, Germany

2018 Open Arms Travel Grant for International Congress of Mathematicians , Rio de Janeiro, Brazil

2018 Simons Foundation (USA) Travel Grant to visit Prof. Sam Nelson

2017 Simons Foundation (USA) Travel Grant and Funding by University of Illinois to visit Prof. Louis Kauffman

2017 European Mathematical Society Travel Fund for AMS Meeting in Washington

2017 Claremont Topology Seminar Fund for visiting Claremont McKenna College

2016 European Mathematical Society Travel Fund for Knots in Hellas Conference

2014 – 2015 Ph.D. Grant by THALES Program of the Greek Ministry of Education and E.U., Scientific Coordinator: Prof. Sofia Lambropoulou

2009 – 2012 Scientific and Technological Research Council of Turkey Travel Grant for Gökova Geometry & Topology Conferences

2004 – 2007 Middle East Technical University Development Foundation Scholarship for Undergraduate Students

ACADEMIC
VISITS

September 2019	Oberwolfach Research Institute for Mathematics,	Oberwolfach, Germany
March 2018	Claremont McKenna College	Claremont, USA
Host: Prof. Sam Nelson		
July 2017	Oberwolfach Research Institute for Mathematics	Oberwolfach, Germany
‘Research in pairs’ program, with L. H. Kauffman ve S. Lambropoulou		
April 2017	University of Illinois at Chicago	Chicago, USA
Host: Prof. Louis H. Kauffman		
April 2017	Claremont McKenna College	Pomona, USA
Host: Prof. Sam Nelson		
April 2015	University of Illinois at Chicago	Chicago, USA
Host: Prof. Louis H. Kauffman		

INVITED
PRESENTATIONS

2023:

MAY Special Session on Algebraic Structures in Knot Theory (Code SS 04), California State University, Fresno

2022:

SEP Topology and Group Theory Workshop, 9 Eylül University, İzmir
 Knots and representation Theory Seminar, Moscow&Beijing online seminar series

2021:

SEP The 33rd Turkish Mathematics Symposium, Istanbul University
JUNE Novel Mathematical Methods in Material Science: Applications to Biomaterials,
 Banff International Research Institute (virtual)
MARCH Topology Seminar, Durham University (virtual)
MARCH Geometric Topology Seminar, University of Ljubljana (virtual)
JANUARY Universidad de Valparaíso,
 II Encuentro de Álgebra y Teoría de Nudos(virtual)

2020

OCT The 8th Spring Meeting of Mathematics (Turkey, virtual)
JULY Novosibirsk State University,
 Physical Knotting, Vortices and Surgery in Nature Conference (virtual)
JUNE Georg-August Universität, Mathematisches Institut Colloquium Talk (virtual)
 Ohio State University Colloquium on Algebraic Structures related to Knots (virtual)

2019 MAR

Izmir Institute of Technology Mathematics Department Seminar	Izmir, Turkey
Istanbul Mathematical Sciences Center	Istanbul, Turkey
Bosphorus University Mathematics Department Colloquium	Istanbul, Turkey

2018:

OCT 9 Eylül University Department of Mathematics Algebra Seminar	Izmir, Turkey
JUL International Congress of Mathematicians 2018 Poster Presentation	Rio de Janeiro, Brazil
APR AMS Spring Western Sectional Meeting	Portland, USA
MAR	
Claremont College Topology Seminar	Pomona, USA
Cal State Fullerton Geometry and Topology Seminar	Fullerton, USA
Izmir University of Economics	Izmir, Turkey

2017:

SEP Izmir Institute of Technology Department of Mathematics Seminar	Izmir, Turkey
APR	
UIC Quantum Topology and Hopf Algebra Seminar	Chicago, USA
AMS Sectional Meeting	
Combinatorial and Algebraic Structures Conference	Washington, USA
USC Geometry and Topology Seminar	Los Angeles, USA
Claremont College Topology Seminar	Pomona, USA
FEB Winter Braids '7 Poster Presentation Université de Caen 1	Caen, France

2016:

JUL Knots in Hellas'16, International Olympic Academy	Olympia, Greece
FEB Winter Braids'6 Poster Presentation, Université de Lille 1	Lille, France

2015:**JUN** Thalys Project Workshop Poster Presentation, NTUA

Athens, Greece

APR UIC Quantum Topology and Hopf Algebra Seminar

Chicago, USA

2014:**JUL** Young Topologists Meeting '14, University of Copenhagen

Copenhag, Denmark

APR Thessaloniki Algebra Days Aristotle University of Thessaloniki

Thessaloniki, Greece

FEB NTUA Low Dimensional Topology Seminar

Athens, Greece

TEACHING
EXPERIENCE**Georg-August-Universitat Göttingen**

A seminar course in Algebraic and combinatorial structures in knot theory

Summer 2022

Georg-August-Universitat Göttingen

Modern Geometry (tutor of exercise sessions and preparation of homeworks&exams) Summer 2022

Izmir Institute of Technology

Manifold Theory

Fall 2021

Izmir Institute of Technology

Fundamentals of Mathematics

Fall 2021

Georg-August-Universitat Göttingen

Introduction to Knot Theory (virtual)

Summer 2021

Georg-August-Universitat Göttingen

A seminar course in Geometric-Topology (virtual)

Winter 2020

Georg-August-Universitat Göttingen

A seminar course in Knot Theory (virtual)

Summer 2020

Izmir Institute of Technology, Turkey

Calculus for Engineering and Science II

Summer 2019

Izmir University of Economics, Turkey

Calculus I

Fall'18

Calculus II

Summer'18

National Technical University of Athens, Greece

Teaching Assistant for

Knot Theory & Its Applications in Biology, Physics, Chemistry

Spring'14, '16

Koç University, Turkey

Teaching Assistant for

Calculus I-II

10/2012 - 06/2013

Statistics - Calculus I

10/2011 - 06/2012

Calculus I - Statistics

10/2010 - 06/2011

Başkent University, Turkey

Teaching Assistant for

Abstract Mathematics-General Topology

10/2008 - 06/2009

Advanced Calculus- Calculus I, Calculus II

10/2009 - 06/2010

Middle East Technical University

Undergraduate Teaching Assistant for

Linear Algebra

10/2007 - 06/2008

(Grading of examinations and 2hr/ a week Office Hours)

MEMBERSHIPS & SERVICE	Reviewer for zbMath, Journal of Knot Theory and Its Ramifications, Mediterranean Journal of Mathematics, Scientific Reports, Communications of the Korean Mathematical Society, Communications in Mathematical Physics, Turkish Journal of Mathematics.
Outreach	Izmir Institute of Technology Children's University Math Instructor Organizer of Imaginary Mathematics Exhibition at Izmir Institute of Technology
LANGUAGES	Turkish (Native), English (Advanced), Greek (A.2)