

# Nursultan Kuanyshov

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Department of Mathematics  
SDU University  
Kaskelen, Almaty, Kazakhstan

Email: [nursultan.kuanyshov@sdu.edu.kz](mailto:nursultan.kuanyshov@sdu.edu.kz)  
Web: <https://people.clas.ufl.edu/nkuanyshov>

## RESEARCH INTERESTS

*Lusternik-Schnirelmann Category, Sectional Category, Cohomological Dimensions, Topological Complexity and Sequential Topological Complexity, Amenable Category, Algebraic Topology, and Topological Data Analysis*

## EDUCATION

- University of Florida**, Gainesville, FL, USA 09/2019-08/2024  
Ph.D., Mathematics  
Advisor: Alexander Dranishnikov
- Tufts University**, Medford, MA, USA 09/2015-06/2017  
M.S., Mathematics
- Boston University**, Boston, MA, USA 01/2014-06/2015  
English Certificate
- Al Farabi Kazakh National University**, Almaty, Kazakhstan 09/2009-06/2013  
B.S., Mathematics

## WORK EXPERIENCE

- SDU University**, Almaty, Kazakhstan 08/2024-present  
Assistant Professor
- MAT 518 Real Analysis and Measure Theory
  - MAT 140 Academic Writing
  - CSS 410 Research tools and methods
  - MAT 370 Methods of Scientific research
- University of Florida**, Gainesville, FL, USA 09/2019-05/2024  
Teaching Assistant
- Fall 2019: MAC 1147 Precalculus with Trigonometry
  - Spring 2020: MAC 1140 Precalculus Algebra
  - Fall 2021, 2022: Spring 2021, 2023: MAC 2313 Analytic Geometry and Calculus III
  - Fall 2023: MAC 2302 Elementary Differential Equations
  - Spring 2024: MAC 2233 Survey of Calculus I
- Instructor
- Summer 2021, 2022, 2023: MAC 2313 Analytic Geometry and Calculus III
- Russian School of Mathematics**, Milton, MA, USA 09/2017-05/2019

Math Teacher

- Taught math for 5th, 6th, 7th, and 8th grades
- Geometry and PreCalculus

**Tufts University**, Medford, MA, USA

10/2016-05/2017

Grader

- Math 21 Introduction to Statistics
- Math 39 Honors Calculus

**Institute of Mathematics and Mathematical Modeling**, Almaty, Kazakhstan 06/2011-12/2013 and 05/2017-2019

Research Assistant

- Invested solutions to nonlocal boundary value problems for polyharmonic equations

**Al Farabi Kazakh National University**, Almaty, Kazakhstan

06/2012-05/2013

Research Assistant

· Investigated Fourier coefficients and properties of biorthogonal systems of root functions for the Sturm-Liouville equation at integral perturbations of the boundary conditions.

## PUBLICATIONS & PREPRINT

*N. Kuanyshov, On the sequential topological complexity of group homomorphisms*, Topology and its Applications 356 (2024): 109045.

*N. Kuanyshov, On the LS-category of homomorphism of almost nilpotent groups*, Topology and its Applications, Volume 342, 1 February 2024, 108776.

*N. Kuanyshov, On the LS-category of homomorphism of groups with torsion*, Algebra and Discrete Mathematics, Volume 36 (2023). Number 2, pp. 166–178

*A. Dranishnikov, N. Kuanyshov, On the LS-category of group homomorphisms*. Math. Z. 305, 14 (2023).

## CONFERENCE PAPERS

*N. Kuanyshov, The behavior of the Fourier coefficients of a system of root functions*. Materials of V National Students Scientifically-Practical Conference on Mathematics, Mechanics and Computer Science, Astana, 2013, pp. 71-72.

*N. Kuanyshov, Solvability of boundary value problems for bi-harmonic equations*. Materials of VII International Scientific Conference of students, undergraduates and young scientists, Lomonosov-2012, Astana, 2012, pp. 67-68.

*B. Koshanov, N. Kuanyshov, Green function of the Neumann problem for some differential equations*. Materials of VII International Scientific Conference, “Functional Analysis and its Applications,” Astana, 2012, pp. 159-160.

*B. Kanguzhin, N. Kuanyshov, Analysis of differential operators on graphs.* Materials of International Scientific Conference, “Problem of differential equations, analysis and algebra,” Aktobe, 2012, pp. 105-107.

## CONTRIBUTED TALKS

- *On the sequential topological complexity of group homomorphisms*, Topology and Dynamics seminar, University of Florida, Gainesville, FL, April 9, 2024.
- *The canonical class for Topological Complexity, 2 talks*, Graduate Student Topology Seminar, University of Florida, Gainesville, FL, January 30 & February 6, 2024.
- *On the LS-category of group homomorphisms*, UF/FSU Topology and Geometry Meeting, Tallahassee, FL, November 3, 2023.
- *On the LS-category of epimorphism of almost nilpotent groups*, Topology and Dynamics seminar, University of Florida, Gainesville, FL, October 10, 2023.
- *Introduction to Topological Complexity and Higher Topological Complexity, 2 talks*, Graduate Student Topology Seminar, University of Florida, Gainesville, FL, September 26 & October 3, 2023.
- *On the LS-category of homomorphism of finitely generated Abelian groups*, 40th Annual Workshop in Geometric Topology, Colorado College, 2023.
- *On the LS-category of homomorphism between finite groups*, Graduate Student Seminar in Algebra, Geometry, and Topology, Temple University, PA 2023.
- *On the LS-category of homomorphisms*, 2023 Spring Southeastern Sectional Meeting at Georgia Institute of Technology, Atlanta, GA, 2023.
- *Introduction to amenable groups and bounded cohomology, 2 talks*, Graduate Student Topology Seminar, University of Florida, Gainesville, FL, March 21 & 28, 2023.
- *On the LS-category of homomorphism between torsion-free nilpotent groups*, 39th Annual Workshop in Geometric Topology, University of Texas, (Online) 2022.
- *Aspherical manifolds, 2 talks*, Graduate Student Topology Seminar, University of Florida, Gainesville, FL, November 30 & December 7, 2022.
- *On the LS-category of group homomorphism between discrete groups*, Topology and Dynamics seminar, University of Florida, Gainesville, FL, November 22, 2022.

- *A relative LS category and sectional category of subgroup inclusion, 2 talks*, Graduate Student Topology Seminar, University of Florida, Gainesville, FL, March 22 & 29, 2022.
- *Nilpotent groups and their Lie Algebras, 2 talks*, Graduate Student Topology Seminar, University of Florida, Gainesville, FL, September 24 & October 1, 2021.
- *Vector Bundle and Projective Module, 2 talks*, Graduate Student Topology Seminar, University of Florida, Gainesville, FL, February 23 & March 2, 2021.
- *Eilenberg-Zilber Theorem, 2 talks*, Graduate Student Topology Seminar, University of Florida, Gainesville, FL, October 6 & 13, 2020.
- *Bundle and Stiefel-Whitney classes, 2 talks*, Graduate Student Topology Seminar, University of Florida, Gainesville, FL, February 14 & 21, 2020.
- *Fuchsian groups, 2 talks*, Graduate Student Topology Seminar, University of Florida, Gainesville, FL, October 29 & November 5, 2019.

## GRANTS

*Temple University Graduate Student Travel Grant*, \$300, June 2023

*University of Florida Department of Mathematics Travel Grant*, \$250, February 2023

*University of Florida Center for Applied Math Travel Grant*, \$700, June 2023

*University of California, Riverside Travel Grant*, \$500, May 2024

*CLAS Dissertation Fellowship funded by the Kenneth and Janet Keene Endowed Fellowship in the Mathematical Sciences*, \$8,000, May 2024

## CONFERENCES ATTENDED

*AMS Sectional Meeting*, Gainesville FL, September 2019

*UF/FSU Topology and Geometry Meeting*, February 2021 (Gainesville, FL) & November 2023 (Tallahassee, FL)

*Annual Workshop in Geometric Topology*, June 2022 (University of Texas, TA) (online) & June 2023 (Colorado Springs, CO) (in person)

*Spring Southeastern Sectional Meeting at Georgia Institute of Technology*, Atlanta, GA, 2023

## AWARDS & RECOGNITION

- *Governmental Scholarship for an undergraduate degree*, 2009

- *U. A. Dzholdasbekov Award*, Institute of Mathematics and Mathematical Modeling, Almaty 2011-2012.
- *Third place*, II National Students Scientifically-Practical Conference on Mathematics, Mechanics and Computer Science, Astana 2012.
- *Diploma for the best work*, VII International Scientific Conference of students, undergraduates and young scientists, Lomonosov-2012, Astana, 2012.
- *Second place*, International Scientific Conference of Students and Young Scientists, World of Science, Almaty 2013.
- *Second place*, Republican Competition Research University Students of Kazakhstan, Almaty 2013.
- *“Bolashak” scholarship*, Minister of Science of Kazakhstan, 01/2014-05/2017.
- *Second place*, VIII International Scientific Conference of students, undergraduates and young scientists, Lomonosov-2013, Astana, 2013.
- *University of Florida Graduate School Fellowship (tuition and stipend)*, 08/2019-06/2024

## SERVICE

- Graduate Student Mentors for incoming students, Graduate Mathematics Association at University of Florida, Fall 2021-2024
- Pennsylvania Junior Academy of Science (PJAS)- Judge

## PROFESSIONAL MEMBERSHIPS

*American Mathematical Society*

09/2015-present

**REFERENCES****• Dr. Alexander Dranishnikov**

Distinguished Professor, Department of Mathematics,  
University of Florida, USA  
dranish@uf.edu

**• Dr. Luca Di Cerbo**

Associated Professor, Department of Mathematics,  
University of Florida, USA  
ldicerbo@ufl.edu

**• Dr. Peter Bubenik**

Associated Professor, Department of Mathematics,  
University of Florida, USA  
peter.bubenik@ufl.edu

**• Dr. Missy Shabazz**

Assistant Instructional Professor, Department of Mathematics,  
University of Florida, USA  
shabazzm@ufl.edu