

# CURRICULUM VITAE

## Alexander Goncharov

**Biographical data:** Born in Rostov region, USSR, in 1954.

### Education:

PhD: Rostov State University, Department of Mathematics (1986)

PhD Thesis Title: Isomorphic Classification of Spaces of Infinitely Differentiable Functions

PhD Thesis supervisor: Vyacheslav Zaharyuta

Undergraduate: Rostov State University, Department of Mathematics (1977)

### Employment history:

2006 - Present Assoc. Professor, Bilkent University, Dept. of Mathematics

1995 - 2006 Visiting Assistant Professor, Assistant Professor, Bilkent University, Dept. of Mathematics

1994 - 1995 Visiting Scientist ( Grant of TUBITAK), Bilkent University,

1980 - 1994 Assistant Professor, Assoc. Professor, Rostov Civil Engineering University, Dept. of Mathematics

### Current Research Interests:

Structure theory of locally convex spaces. Basis problem. Properties of bases.

Spaces of infinitely differentiable and Whitney functions. Extension Problem.

Theory of approximation. Extremal polynomials. Lebesgue constants.

Metric and topological properties of the generalized Julia sets.

Orthogonal polynomials for continuous singular measures.

Potential theory. Harmonic measures on small sets. Smoothness of Green functions.

### Articles:( During stay at Bilkent )

1. On Isomorphic classification of spaces  $s\hat{\otimes}E'_\infty(a)$ , In: *Linear Topological Spaces and Complex Analysis*, **1** (1994), 14-24, METU-TÜBİTAK, Ankara-Turkey. A.Goncharov, T.Terzioğlu, V.P.Zahariuta.

2. Some open problems in the theory of locally convex spaces, In: *Linear Topological Spaces and Complex Analysis*, **1** (1994), 147-165, METU-TÜBİTAK, Ankara-Turkey.

- A.Aytuna, P.B.Djakov, A.P.Goncharov, T.Terzioğlu, V.P.Zahariuta.
3. Compound invariants and spaces of  $C^\infty$  functions, In:*Linear Topological Spaces and Complex Analysis*, **2** (1995), 45-55, METU-TÜBİTAK, Ankara-Turkey. A.Goncharov.
  4. Linear topological invariants for tensor products of power  $F$ - and  $DF$ -spaces, *Turkish J. Math.*, **19** (1995), 90-101. A.Goncharov, V.Zahariuta.
  5. On isomorphic classification of tensor products  $E_\infty(a) \hat{\otimes} E'_\infty(b)$ , *Dissertationes Mathematicae, Warszawa*, **CCCL**, 27pp., 1996. A.Goncharov, T.Terzioğlu, V.Zahariuta.
  6. A compact set without Markov's property but with an extension operator for  $C^\infty$ -functions, *Studia Math.*, **119**(1996), 27-35. A.Goncharov.
  7. A continuum of pairwise nonisomorphic spaces of Whitney functions on Cantor-type sets, In:*Linear Topological Spaces and Complex Analysis*, **3** (1997), 57-64, METU-TÜBİTAK, Ankara-Turkey. A.P.Goncharov, M.Kocatepe.
  8. Perfect sets of finite class without the extension property, *Studia Math.* **126**(1997), 161-170. A.Goncharov.
  9. Isomorphic classification of the spaces of Whitney functions, *Michigan Math. J.*, **44**(1997), 555-577. Alexander P.Goncharov and Mefharet Kocatepe.
  10. Spaces of Whitney functions with basis, *Math.Nach.*, **220**, (2000), 45-57. A.Goncharov.
  11. Sequence space representations of spaces of Whitney functions, *Result.Math.*, **37**, (2000), 3-12. B. Arslan, A.P. Goncharov, M. Kocatepe.
  12. On explicit form of extension operator for  $C^\infty$ - functions, *East Journal on Approximation*, **7**(2), (2001), 179-193. A.P.Goncharov.
  13. On extension property of Cantor-type sets, *The proceedings of the Sixth Conference "Function Spaces"*, 129-137, Wrocław, Poland, 3-8 September 2001. Alexander Goncharov.
  14. Spaces of Whitney functions on Cantor-type sets, *Canad.J.Math.*, **54**(2)(2002), 225-238. Bora Arslan, Alexander P.Goncharov and Mefharet Kocatepe.
  15. Basis in the space of  $C^\infty$ - functions on a graduated sharp cusp, *The Journal of Geometric Analysis*, **13**(1),(2003), 95-106. A.P.Goncharov and V.P.Zahariuta.
  16. A local version of the Pawłucki-Pleśniak extension operator, *J.Approx.Theory*, **132**(2005), 34-41. M.Altun and A. Goncharov.

17. Diametral dimension of spaces of Whitney jets on sequences of points, *Siberian Math. Journal*, **46**(2)(2005), 1-7. A.Goncharov and M.Zeki.
18. Extension via interpolation", *The Proceedings of The Wladyslaw Orlicz Centenary Conference and Function Spaces VII*, 43-49, Warszawa, 2005. A.Goncharov.
19. Leja points for Cantor-type sets", *Constructive Theory of Functions*, 135-144, Varna, 2005. A.Goncharov
20. Basis in the space of  $C^\infty$ - functions on Cantor-type sets, *Constructive Approximation*, **23**(2006), 351-360. A. Goncharov.
21. Local interpolation and interpolating basis, *East Journal on Approximation*, **13**(1), (2007), 21-36. A.P.Goncharov.
22. On the geometric characterization of the extension property, *Bull. Belg. Math. Soc.*, **14**(2007), 513-520. A.Goncharov.
23. On characterization of the extension property, *The proceedings of 6-th International ISAAC Congress*, Ankara, 2007. A.Goncharov.
24. Wavelet Basis in the Space  $C^\infty[-1, 1]$ , *The Open Mathematics Journal*, (2008), 1, 19-24. Alexander P.Goncharov and Ali Şamil Kavruk.
25. On growth of norms of Newton interpolating operators, *Acta Math.Hungar*, **125**(4) (2009), 299-326. A.P.Goncharov.
26. On Smoothness of the Green Function for the Complement of a Rarefied Cantor-Type Set, *Constr.Approx.*, **33**, (2011), 265-271. Muhammed Altun and Alexander Goncharov.
27. Bases in Banach spaces of smooth functions on Cantor-type sets, *Journal of Approximation Theory*, **163**, (2011), 1798-1805, A. P. Goncharov and N. Ozfidan.
28. Kolmogorov-Landau functions, *Constructive Theory of Functions. In memory of Borislav Bojanov, (Edited by G. Nikolov and R. Uluchev), pp.1-9, Sofia: Martin Drinov Academic Publishing House, 2011.* Alexander P. Goncharov.
29. Smoothness of the Green Function for a Special Domain, *Ann. Polon. Math.*, **106** (2012), 113-126. Serkan Celik and Alexander Goncharov.
30. Interpolating basis in the space  $C^\infty[-1, 1]^d$ , *Proceedings of the conference Constructive Theory of Functions 2013*, (2014), 97-100. A. P. Goncharov.

31. Weakly Equilibrium Cantor-type sets, *Potential Anal.*, 40 (2014), no. 2, 143-161. Alexander P. Goncharov.
32. Two Measures on Cantor Sets, *Journal of Approx. Theory*, 186 (2014), 28-32. Gökalp Alpan, Alexander Goncharov.
33. Best exponents in Markov's inequalities, *Math. Inequal. Appl.*, 17 (2014), no. 4, 1515-1527. Alexander Goncharov.
34. Widom Factors, *Potential Anal.*, 42 (2015), no. 3, 671-680. Alexander Goncharov, Burak Hatinoğlu.
35. Widom factors for the Hilbert norm, *Constructive approximation of functions, Banach Center Publ., 107, Polish Acad. Sci. Inst. Math.*, 11-18, , Warsaw, 2015. Alpan, Gökalp; Goncharov, Alexander.
36. Orthogonal polynomials for the weakly equilibrium Cantor sets, *Proc. Amer. Math. Soc.*, 144 (2016), no. 9, 3781-3795. Alpan, Gökalp; Goncharov, Alexander.
37. Some asymptotics for extremal polynomials, *Computational analysis, Chapter 7, 87-101, Springer Proc. Math. Stat., 155, Springer, Cham*, 2016. Alpan, Gökalp; Goncharov, Alexander; Hatinoğlu, Burak.
38. Asymptotic Properties of Jacobi Matrices for a Family of Fractal Measures, *Exp. Math.*, Published online: 26 Sep. 2016. Gökalp Alpan, Alexander Goncharov, Ahmet Nihat Şimşek.
39. Mityagin's extension problem. Progress report, *J. Math. Anal. Appl.*, 448 (2017), 357-375. Alexander Goncharov, Zeliha Ural.
40. Some Open Problems Concerning Orthogonal Polynomials on Fractals and Related Questions, *Dolomites Res. Notes Approx.*, Volume 10, (2017). Gökalp Alpan, Alexander Goncharov.
41. Orthogonal Polynomials on Generalized Julia Sets, *Complex. Anal. Oper. Theory*, 11, (2017), 1845-1864. G.Alpan, A.Goncharov.
42. Bases in some spaces of Whitney functions, *Ann. Funct. Anal.*, 9 (2018), no. 1, 56-71. Alexander Goncharov, Zeliha Ural.
43. On the absence of stability of bases in some Fréchet spaces, *Anal. Math.* 46 (2020), no. 4, 761-768. A.Goncharov.

44. Logarithmic dimension and bases in Whitney spaces, *Turkish J. Math.* 45 (2021), no. 4, 1580–1591. Goncharov, Alexander, Şengül Tezel, Yasemin.
45. Quasi-equivalence of bases in some Whitney spaces, *Canad. Math. Bull.* Vol. 65 (1), (2022), pp. 106–115, Alexander Goncharov and Yasemin Şengül.
46. Bases in the spaces of Whitney jets, *Banach J. Math. Anal.* (2022), no. 16, 1-17. Alexander Goncharov.

**Presentation given at conferences:** ( During stay at Bilkent )

- Linear Topological Spaces and Spaces of Analytic Functions I, Edirne, Turkey (1994)
- Linear Topological Spaces and Spaces of Analytic Functions II, Edirne, Turkey (1995)
- Function Spaces IV, Zelena Gora, Poland (1995)
- International Conference on Geometry and Analysis in the Memory of N.V.Efimov, Novorossiysk, Russia (1998)
- Linear Topological Spaces and Spaces of Analytic Functions III, Edirne, Turkey (1999)
- Differential Analysis, Warsaw, Poland (2000)
- Functional Analysis, Valencia, Spain (2000)
- Function Spaces VI, Wroclaw, Poland (2001)
- Function Spaces VII, Poznan, Poland (2003)
- Conference on Approximation Theory, Krakow, Poland (2004)
- Real Analytic and Complex Analytic Methods in Functional Analysis, Istanbul, Turkey (2004)
- International Conference on Constructive Theory of Functions, Varna, Bulgaria (2005)
- Fourth International Workshop on Functional Analysis, Liege, Belgium (2005)
- 6-th International Summer School on Potential Theory and Applications, Sofia, Bulgaria (2007)
- 6-th International ISAAC Congress, Ankara, Turkey (2007)
- International Winter School in honor of Prof. Ul'ianov, Saratov, Russia (2008)
- 7-th International Summer School on Potential Theory and Applications, Baja, Hungary (2008)
- CMFT-2009, Bilkent, Ankara, Turkey (2009)
- Eight Summer School in Potential Theory, Budapest, Hungary (2009)
- Constructive Theory of Functions, Sozopol, Bulgaria (2010)
- Conference on Several Complex Variables on the occasion of Prof. Siciak's 80th, Krakow, Poland (2011)
- 8-th International Symposium on Geometric Function Theory and Applications, Ohrid, Republic of Macedonia (2012)
- International Conference on Mathematical Analysis, Differential Equations and their applications, Mersin, Turkey (2012)
- Constructive Theory of Functions, Sozopol, Bulgaria (2013)
- International Conference on Fourier Analysis and Approximation Theory dedicated to the 80th birthday of Academician Levan Zhizhiashvili, Bazaleti, Georgia (2013)

Conference on Constructive Approximation of Functions, Bedlewo, Poland (2014)  
3rd International Conference on Applied Mathematics and Approximation Theory - AMAT, Ankara, Turkey (2015)  
Tenth Summer School on Potential Theory, Budapest, Hungary (2015)  
5th Workshop on Fourier Analysis and Related Fields, Budapest, Hungary (2015)  
Whitney Extension Problem, Technion, Haifa, Israel (2016)  
HAAT 2016, Barcelona, Spain (2016)  
International Conference on Complex Analysis and Related Topics, Bucharest, Romania (2016)  
The 4th Dolomites Workshop on Constructive Approximation and Applications, Alba di Canazei, Italy (2016)  
Orthogonal Polynomials and Special Functions, Copenhagen, Denmark (2016)  
Complex and Harmonic Analysis III, Holon-Haifa, Israel (2017)  
Workshop on functional analysis and operator theory, Valencia, Spain (2017)  
New Developments in Complex Analysis and Function Theory, Heraklion, Greece (2018)  
The 11-th Whitney problems workshop, Trinity College Dublin, Ireland (2018)  
Analysis Mathematica Conference, Budapest, Hungary (2019)  
Caucasian Mathematics Conference III, Rostov-on-Don, Russia (2019)  
Dolomites Research Week on Approximation, Alba di Canazei, Italy (2019)  
The Conference in honor of Professor Kocatepe, Ankara, Turkey, (2022).

Invited lectures in Jagellonian University (Poland), University of British Columbia (Canada), and several Turkish universities (METU, TOBB, Atilim University, Ankara University, Çankaya University).

#### **PhD students:**

Muhammed Altun, Extension Operators for Spaces of Infinitely Differentiable Functions, 2005  
Necip Ozfidan, Bases in Banach Spaces of smooth functions on Cantor-type Sets, 2013  
Zeliha Ural Merpez, Extension problem and bases for spaces of infinitely differentiable functions, April, 2017  
Gökalp Alpan, Asymptotics of extremal polynomials for some special cases, May, 2017.

#### **TUBITAK grants:**

115F199, Orthogonal polynomials associated with continuous singular measures and related problems, Principal Investigator, September 2015-August 2017

119F023, Bases in spaces of continuous functions, Whitney functions and related problems, Principal Investigator, September 2019-December 2021.

**Member of Editorial Boards in:** *Analysis Mathematica*.

**Refereeing for Scholarly and Professional Journals:** *Studia Math.*, *Bulletin of the Polish Academy of Sciences*, *Archiv der Mathematik*, *Mathematische Nachrichten*, *Journal of Approx. Theory*, *Constructive Approximation*, *Analysis Mathematica*, *Hacettepe Journal of Mathematics and Statistics*, *Mathematical Inequalities and Applications*.

**Reviewing for Mathematical Reviews.**

**Teaching. Graduate Courses:**

MATH 500 Mathematical Analysis  
MATH 501 Real Analysis I  
MATH 502 Real Analysis II  
MATH 507 Introduction to Potential Theory  
MATH 601 Topics in Real Analysis  
MATH 605 Topics in Functional Analysis

**Teaching. Undergraduate Courses:**

MATH 101 Calculus I,  
MATH 102 Calculus II  
MATH 104 Thinking Mathematically II  
MATH 105 Introduction to Calculus I  
MATH 106 Introduction to Calculus II  
MATH 110 Discrete Mathematics  
MATH 111 Intermediate Calculus I  
MATH 112 Intermediate Calculus II  
MATH 113 Single Variable Calculus  
MATH 114 Multi Variable Calculus  
MATH 116 Intermediate Calculus III  
MATH 202 Complex Analysis I  
MATH 215 Mathematical Analysis  
MATH 220 Linear Algebra  
MATH 227 Introduction to Linear Algebra  
MATH 230 Probability and Statistics for Engineers  
MATH 240 Differential Equations  
MATH 260 Introduction to Statistics  
MATH 264 Statistics for Social Sciences  
MATH 313 Real Analysis I  
MATH 314 Real Analysis II  
MATH 319 Interpolation and Approximation  
MATH 414 Functional Analysis  
MATH 415 Analysis of Smooth Functions