William & Mary

Curriculum Vitae Standard Format

1 Personal Information

Name: Vladimir Bolotnikov Date February 16, 2024

Office Address: Jones Hall 129

Position: Professor Mathematics
Rank Department

2 Education

Academic degrees, institutions and dates

Ph. D	Ben–Gurion University of the Negev, Beer–Sheva, Israel	1996
B.Sc and M.Sc.	Kharkov State University, Kharkov, Ukraine	1984

3 Academic positions

Teaching and research positions, including dates

1998– Present	Department of Mathematics, William & Mary, Williamsburg **Professor** (2010 – Present) **Associate Professor** (2005 – 2010) **Assistant Professor** (2000 – 2005) **Visiting Assistant Professor** (1998 – 2000)
1996–1998	Department of Mathematics, the Weizmann Institute of Science, Rehovot, Israel **Postdoctoral Fellow** (1996 – 1998)
1995–1996	Department of Electrical Engineering, University de Marne la Vallee, Paris, France **Chateaubriand Postdoctoral Fellow** (1995 –1996)
1991–1998	Department of Mathematics, Ben–Gurion University of the Negev Beer–Sheva, Israel **Lecturer** (1997 – 1998) **Instructor** (1991 – 1995)

4 Editorial positions

1. Complex Analysis and Operator Theory — Editorial Board member.
2. Complex Variables and Elliptic Equations — Associate Editor.
3. Communications in Mathematical Analysis — Associate Editor.
4. Advances in Operator Theory — Associate Editor.
5. Operators and Matrices — Associate Editor.

5 Honors, Prizes and Awards

2014-17	University Professor for Teaching Excellence
2012	Plumeri Award for Faculty Excellence
2007-10	Class 1963 Associate Professorship
2007	Thomas Jefferson Teaching Award
2005	Alumni Fellowship Award for Excellence in Teaching
2004	Simon Teaching Prize
1994	Miphal Hapais Award (Israel)
1985	Honorary Sign "The inventor of the USSR"
1984	Ukrainian Ministry of Higher Education Award

6 Teaching

6.1 Courses taught at the College of William and Mary

1. Calculus Math 111
2. Calculus Math 112
3. Linear Algebra Math 211
4. Multi-variable calculus Math 212
5. Multi-variable calculus for scientists Math 213
6. Foundations of higher mathematics Math 214
7. Differential Equations Math 302

8. Abstract Algebra Math 307
9. Intermediate Linear Algebra
10. Elementary Analysis Math 311
11. Intermediate Analysis Math 403
12. Complex analysis Math 405
13. Advanced Linear Algebra Math 408
14. Topics in Geometry Math 416
15. Functional Analysis

6.2 Honors projects

1. P. A. Smith, *Boundary Nevanlinna-Pick interpolation for generalized Nevanlinna functions*, 2005.
2. Y. Gilboa, *Poles and zeros of generalized Carathéodory functions*, 2011.
3. N. Woods, *Fixed points of Pick and Stieltjes functions*, 2012.
4. R. Wang, *Schur-class power series over quaternions*, 2022.

6.3 Research advising of undergraduates

1. P. R. Meade, *Shells of matrices in indefinite inner product spaces*, 2001 (jointly with L. Rodman and C. K. Li), Published in J. Linear Alg. **9** (2002), 67–92.
2. B. MacClain, *Maximum determinant extension problems for a class of structured matrices*, 2002.
3. P. A. Smith, *Positive extension problems for a class of structured matrices*, 2003. Published in Linear Algebra Appl. **281** (2004), 165–195.
4. T. Wang and J. Weiss, *Nevanlinna–Pick interpolation by rational functions with a single pole inside the unit disk*, Published in J. Comput. Appl. Math. 236 (2011), no. 6, 1497–1501.
5. S. Cameron, *Nevanlinna-Pick problem with boundary conditions: minimal norm rational solutions of low degree*, 2011. Published in Comp. Appl. Math. **236** (2012), no. 13, 3123–3136.
6. T. Wang and J. Weiss, *Boundary angular derivatives of generalized Schur functions*, 2011. Published in J. Aust. Math. Soc. **93** (2013), no. 3, 203–224.

7 Fellowships and Grants

1. 1995: Chateaubriand Fellowship (France)
2. 1999: PIMS Postdoctoral Fellowship (not used)
3. 2001–2003, 2014: Summer Research grants from the College of William and Mary
4. 2009–2012: **NSF** Grant DMS-0901124 (Analysis Program)
5. 2017–2024: Simons Collaboration grant.

8 Research

8.1 Monographs

1. V. Bolotnikov and H. Dym, *On boundary interpolation for matrix Schur functions*, Memoirs of the American Mathematical Society, No. 856, Providence, Rhodes Island, 2006.
2. J. A. Ball and V. Bolotnikov, *Noncommutative Function-Theoretic Operator Theory and Applications*, Cambridge Tracts in Mathematics **225**, Cambridge University Press, Cambridge, 2022, 428 pp.

8.2 Inventions and patents

1. *Device for trial of the conveying tags.* Certificate of authority # 738981 (USSR), Bulletin of Inventions, vol. 21 (1980) (with A. Bolotnikov).
2. *Device for trial of shroud elements.* Certificate of authority # 1025641 (USSR), Bulletin of Inventions, vol. 24 (1983) (with A. Bolotnikov).

8.3 Refereed research papers

1. *Description of solutions of a degenerate moment problem on the axis and the half-axis.*
2. *On a Sylvester equation over a division ring*, 10 pp. to appear in *Proceedings of the 12th ISAAC congress*, Research Perspectives. Birkhüser, 2021.
3. *On the Carathéodory-Fejér interpolation problem for Stieltjes functions*, 25 pp. to appear Operator Theory: Advances and Applications Teor. Funktsii Funktsional. Anal. i Prilozhen., **50** (1988), 25–31.
4. *Two sided interpolation problems for a class of analytic functions.* Z. Anal. Anwendungen, **12** (1993), No. 2, 211–238 (with D. Alpay).
5. *On some operator colligations and associated reproducing kernel Hilbert spaces.* Oper. Theory Adv. Appl., **61** (1993), 1–27 (with D. Alpay, A. Dijksma and H. de Snoo).

6. *Two–sided Nevanlinna–Pick problem in the Stieltjes class.* Oper. Theory Adv. Appl., **62** (1993), 15–37.

7. *On a class of functions analytic in a half disk and an associated interpolation problem.* J. Math. Anal. Appl., **182** (1994), No.1, 1–22 (with D. Alpay).

8. *On a general moment problem and certain matrix equations.* Linear Algebra Appl., **203/204** (1994), 3–43 (with D. Alpay).

9. *Tangential Carathéodory-Fejer interpolation for Stieltjes functions at real points.* Z. Anal. Anwendungen, **13** (1994), No. 1, 111–136.

10. *The Carathéodory–Féjer interpolation problem in Hardy spaces.* Z. Anal. Anwendungen, **13** (1994), No.4, 583–597 (with D. Alpay).

11. *On tangential interpolation of H_2 functions.* Trans. Amer. Math. Soc., **347** (1995), 675–686 (with D. Alpay and Y. Peretz).

12. *Degenerate Stieltjes matrix moment problem and associated J–inner polynomials.* Z. Anal. Anwendungen, **14** (1995), No. 3, 441–468.

13. *Two–sided interpolation for matrix functions with entries in the Hardy space.* Linear Algebra Appl., **223/224** (1995), 31–56 (with D. Alpay).

14. *Classes of pairs of meromorphic matrix functions generated by positive kernels and associated Nevanlinna–Pick problem.* Integral Equations Operator Theory, **23** (1995), No. 3, 245–267 (with D. Alpay).

15. *An interpolation problem with symmetry and related questions.* Z. Anal. Anwendungen, **15** (1996), No. 1, 19–29 (with D. Alpay and P. Loubaton).

16. *On degenerate Hamburger moment problem and extensions of nonnegative Hankel matrices.* Integral Equations Operator Theory, **25** (1996), No. 3, 253–276.

17. *On some operator colligations and associated reproducing kernel Pontryagin spaces.* J. Funct. Anal., **136**, (1996), No. 1, 39–80 (with D. Alpay, A. Dijksma and H. de Snoo).

18. *On tangential $\mathbf{H}_2$ interpolation with second order norm constaints.* Integral Equations Operator theory, **24** (1996), No. 2, 156–178 (with D. Alpay and P. Loubaton).

19. *On two–sided residue interpolation for matrix–valued H_2–functions with symmetries.* J. Math. Anal. Appl., **200** (1996), No. 1, 76–105 (with D. Alpay and P. Loubaton).

20. *On some general moment problem on the half–axis.* Linear Algebra Appl., **255** (1997), 57–112.

21. *Dissipative periodic systems and symmetric interpolation in the Schur class.* Archiv Math. (Basel), **68** (1997), No. 5, 371–387 (with D. Alpay and P. Loubaton).

22. *On tangential interpolation in Hilbert space modules and some applications.* Oper. Theory Adv. Appl., **95** (1997), 37–68 (with D. Alpay).

23. *On interpolation for Hardy functions in a certain class of domains under moment type constraints.* Houston J. Math., **23**, No. 3 (1997), 539–571 (with D. Alpay and P. Loubaton).

24. *On a new positive completion problem for Toeplitz block matrices.* Linear Algebra Appl., **268** (1998), 247–287 (with D. Alpay and P. Loubaton).

25. *On the Nevanlinna–Pick problem for generalized Stieltjes functions.* Integral Equations Operator Theory, **30**, (1998), No. 4, 379–408 (with D. Alpay and A. Dijksma).

26. *On Two–Sided Interpolation for Upper Triangular Hilbert–Schmidt Operators.* Integral Equations Operator Theory, **31**, (1998), No. 3, 259–286 (with D. Alpay).

27. *On tangential interpolation with symmetries and multipoint interpolation problem for matrix–valued Hardy functions.* Integral Equations Operator Theory, **32**, (1998), No. 1, 1–28 (with D. Alpay and L. Rodman).

28. *Hilbert spaces contractively included in the Hardy space of the bidisk.* C. R. Acad. Sci. Paris Ser. I Math. **326** (1998), No. 12, 1365–1370 (with D. Alpay, A. Dijksma, J. Rovnyak and C. Sadosky).

29. *On degenerate interpolation, maximum entropy and extremal problems for matrix Schur functions.* Integral Equations Operator Theory, **32**, (1998), No. 4, 367–435 (with H. Dym).

30. *On Bitangential Interpolation in the Time Varying Setting for Hilbert Schmidt Operators: the continuous time case.* J. Math. Anal. Appl., **228** (1998), No. 2, 275–292 (with D. Alpay, B. Freydin and Y. Peretz).

31. *On tangential interpolation problem for matrix–valued* $\mathbf{H}_2$*–functions of two variables.* Proc. Amer. Math. Soc., **127** (1999), No. 6, 1789-1799 (with D. Alpay).

32. *Carathéodory–Féjer problem for pairs of meromorphic functions.* Math. Nachr. 199 (1999), 17–69 (with D. Alpay).

33. *One–sided tangential interpolation for operator–valued Hardy functions on polydisks.* Integral Equations Operator Theory, **35** (1999), No. 3, 253–270 (with D. Alpay and L. Rodman).

34. *Normal forms and joint numerical range of doubly commuting matrices.* Linear Algebra Appl., **301** (1999), 187–194 (with L. Rodman).

35. *On an operator approach to interpolation problems for Stieltjes functions.* Integral Equations Operator Theory, **35** (1999), No. 4, 423–470 (with L. A. Sakhnovich).

36. *On two-sided interpolation for upper triangular matrices*. Electron. J. Linear Algebra, **6** (1999/2000), 31–55 (with D. Alpay).

37. *Sections de Brune en théorie des systèmes non stationnaires*. C. R. Acad. Sci. Paris Ser. I Math., **330** (2000), 173–178 (with D. Alpay, P. Dewilde and A. Dijksma).

38. *On the bitangential interpolation problem for contractive valued functions in the polydisk*. J. Oper. Theory **44** (2000), 277–301 (with D. Alpay, and J. A. Ball).

39. *Hilbert spaces contractively included in the Hardy space of the bidisk*. Positivity, **5** (2001), 25-50 (with D. Alpay, A. Dijksma and C. Sadosky).

40. *A coisometric realization for triangular integral operators.* Oper. Theory Adv. Appl., **122** (2001), 13–52 (with D. Alpay, A. Dijksma and Y. Peretz).

41. *Minimal distortion problems for classes of unitary matrices*. Electron. J. Linear Algebra **8** (2001), 26–46 (with C.-K. Li and L. Rodman).

42. *On the second order interpolation for rational vector functions*. Oper. Theory Adv. Appl. **123** (2001), 139–159.

43. *On positivity of analytic matrix functions in polydisks*. Linear Algebra Appl., **328** (2001), 69–94 (with L. Rodman).

44. *Positive extension and completion problems for a class of structured matrices*. Linear and Multilinear Algebra, **48** (2001), 189–235 (with L. Rodman).

45. *Two–sided tangential interpolation for Hilbert–Schmidt operator functions on polydisks*. Oper. Theory Adv. Appl. **124** (2001), 63–87 (with D. Alpay and L. Rodman).

46. *The Schur algorithm and reproducing kernel Hilbert spaces in the ball*, Linear Algebra Appl. **342** (2002), 163–186 (with D. Alpay and H. T. Kaptanoğlu).

47. *Brune sections in the nonstationary case*, Linear Algebra Appl. **343-344** (2001), 389-418 (with D. Alpay, P. Dewilde, and A. Dijksma).

48. *A boundary Nevanlinna–Pick problem for a class of analytic matrix-valued functions in the unit ball*, Linear Algebra Appl., **346** (2002), 239–260.

49. *Some extensions of Loewner's theorem on monotone matrix functions*, J. Funct. Anal., **189** (2002), 1–20 (with D. Alpay, A. Dijksma and J. Rovnyak).

50. *Finite dimensional backward shift invariant subspaces of Arveson spaces*, Linear Algebra Appl., **349** (2002), 265-282 (with L. Rodman).

51. *Shells of matrices in indefinite inner product* Electron. J. Linear Alg. **9** (2002), 67–92 (with C.-K. Li, P. Meade, C. Mehl and L. Rodman).

52. *Two-sided Residue Interpolation in Matrix H_2 Spaces with Symmetries: Conformal Conjugate Involutions*, Linear Algebra Appl., **351/352** (2002), 27–68 (with D. Alpay and L. Rodman).

53. *Nonstationary analogues of the Herglotz representation theorem: the discrete unbounded case*, Archiv Math. **78** (2002), 465–474 (with D. Alpay, A. Dijksma, and B. Freydin).

54. *On a bitangential interpolation problem for contractive valued functions on the unit ball*, Linear Algebra Appl. **353** (2002), 107–147 (with J. A. Ball).

55. *An interpolation problem on the distinguished boundary of the polydisk for Schur–Agler functions*, J. Math. Anal. Appl. **273** (2002), no. 2, 328–348. (with J. A. Ball).

56. *Interpolation for multipliers on reproducing kernel Hilbert spaces*, Proc. of the AMS **131** (2003), 1373-1383.

57. *Pairs of functions with indefinite Pick matrices*, Linear Algebra Appl., **367** (2003), 271-290 (with A. Kheifets and L. Rodman).

58. *Functions with Pick matrices having bounded number of negative eigenvalues*, Contemporary Mathematics, **323** (2003), 393–417 (with A. Kheifets and L. Rodman).

59. *A bitangential interpolation problem on the closed unit ball for multipliers of the Arveson space*, Integral Equations Operator Theory **46** (2003), 125-164 (with J. A. Ball).

60. *Krein–Langer factorization via pole triples*, Integral Equations Operator Theory **47** (2003), no. 2, 169–195 (with L. Rodman).

61. *Nevanlinna–Pick interpolation: Pick matrices have bounded number of negative eigenvalues*, Proc. of the AMS **132** (2004), 769-780 (with A. Kheifets and L. Rodman).

62. *Positive extension problems for a class of structured matrices*, Linear Algebra Appl. **281** (2004), 165–195 (with P. Smith).

63. *Remarks on interpolation in reproducing kernel Hilbert spaces*, Houston J. Math. **30** (2004), no. 2, 559-576 (with L. Rodman).

64. *Jet functions having indefinite Carathéodory–Pick matrices*, Linear Algebra Appl., **385** (2004), 215–286 (with A. Kheifets and L. Rodman).

65. *Finite dimensional backward shift invariant subspaces of some classes of reproducing kernel Hilbert spaces*, Linear Multilinear Algebra, **52** (2004), 221-334 (with L. Rodman).

66. *Boundary interpolation for contractive-valued functions on circular domains in* $\mathbf{C}^n$, in: *Current trends in operator theory and its applications*, 107–132, Oper. Theory Adv. Appl., **OT 149**, Birkhäuser, Basel, 2004 (with J. A. Ball).

67. *Realization and interpolation for Schur-Agler-class functions on domains with matrix polynomial defining function in* $\mathbf{C}^n$, J. Funct. Anal. **213** (2004), 45–87 (with J. A. Ball)

68. *On Caratheodory–Fejer problem for generalized Schur functions*, Integral Equations Operator Theory, **50** (2004), no.1, 9-41.

69. *Operator valued jet functions with positive Carathéodory–Pick operators*, Integral Equations Operator Theory, **50** (2004), no. 3, 291–304 (with A. Kheifets and L. Rodman).

70. *Interpolation problems with operator argument for contractive-valued functions on general domains in* $\mathbf{C}^n$, New York J. **11** (2005), 247–290 (with J. A. Ball).

71. *Boundary Nevanlinna–Pick interpolation problems for generalized Schur functions*, Operator Theory: Advances and Applications **OT 165** (2006), 67–119 (with A. Kheifets).

72. *A higher order analogue of the Carathéodory–Julia theorem*, J. Funct. Anal. **237** (2006), no. 1, 350–371 (wth A. Kheifets).

73. *On negative inertia of Pick matrices associated with generalized functions*, Integral Equations Operator Theory **56** (2006), no. 3, 323–355 (with A. Kheifets).

74. *Multivariable backward-shift-invariant subspaces and observability operators*, Multidimens. Syst. Signal Process. **18** (2007), no. 4, 191–248 (with J. A. Ball and Q. Fang).

75. *Schur-class multipliers on the Fock space: de Branges-Rovnyak reproducing kernel spaces and transfer-function realizations*, in: *Operator Theory, structured matrices and dilations*, pp. 85–114, Theta, Bucharest, 2007 (with J. A. Ball and Q. Fang).

76. *Transfer-function realization for multipliers of the Arveson space*, J. Math. Anal. Appl. **333** (2007), no. 1, 68–92 (with J. A. Ball and Q. Fang).

77. *Interpolation in the noncommutative Schur-Agler class*, J. of Operator Theory **58** (2007), no. 1, 83–126 (with J. A. Ball).

78. *The higher order Carathéodory–Julia theorem and related boundary interpolation problems*, Operator Theory: Advances and Applications **OT 179** (2008), 63–102 (with A. Kheifets).

79. *A uniqueness result on boundary interpolation*, Proc. Amer. Math. Soc. **136** (2008), 1705-1715.

80. *Schur-class multipliers on the Arveson space: de Branges-Rovnyak reproducing kernel spaces and commutative transfer-function realizations*, J. Math. Anal. Appl. **341** (2008), 519–539 (with J. A. Ball and Q. Fang).

81. *A boundary analogue of the Carathéodory-Schur interpolation problem*, Proc. Amer. Math. Soc. **136** (2008), no. 9, 3121-3131.

82. *Interpolation problems for Schur multipliers on the Drury-Arveson space: from Nevanlinna-Pick to Abstract Interpolation Problem*, Integral Equations Operator Theory **62** (2008), no. 3, 301-349 (with J. A. Ball).

83. *Carathéodory–Julia type theorems for operator valued Schur functions*, J. d'Analyse Mathematique **106** (2008), 237–270 (with A. Kheifets).

84. *On boundary angular derivatives of an analytic self-map of the unit disk*, C. R. Acad. Sci. Paris, Ser. I **347** (2009), 227–230.

85. *Boundary rigidity for a class of meromorphic functions on the unit disk*, Operators and Matrices **3** (2009), no. 2, 283–301.

86. *Nevanlinna–Pick meromorphic interpolation: the degenerate case and minimal norm solutions*, J. Math. Anal. Appl. **353** (2009), pp. 642-651.

87. *On an interpolation problem for generalized Schur functions*, Oper. Theory Adv. Appl. **OT 195** (2009), 83–101.

88. *Carathéodory-Julia type conditions and symmetries of boundary asymptotics for analytic functions on the unit disk*, Math. Nachr. **282** (2009), no. 11, 1513-1536 (with A. Kheifets).

89. *On inertia of certain structured Hermitian matrices*, in Oper. Theory Adv. and Appl., **OT 199** (2010), 175–190.

90. *A multi-point degenerate interpolation problem for generalized Schur functions*, Operators and Matrices **4** (2010), no. 2, 151–191.

91. *An algorithm for finding low degree rational solutions of the Schur coefficient problem*, Functiones et Approximatio **42** (2010), no. 1, 37–51.

92. *A constrained Nevanlinna-Pick interpolation problem for matrix-valued functions*, Indiana Math. J. **59** (2010), no. 1, 15–52 (with J.A. Ball and S. ter Horst).

93. *Canonical de Branges-Rovnyak model transfer-function realization for multivariable Schur-class functions*, in: *Hilbert spaces of analytic functions*, CRM Proceedings and Lecture Notes **51** (2010), 1–40 (with J.A. Ball).

94. *Interpolation in de Branges-Rovnyak spaces*, Proc. Amer. Math. Soc. **139** (2011), 609-618 (with J.A. Ball and S. ter Horst).

95. *Multi-point degenerate interpolation problem for generalized Schur functions: description of all solutions*, Comput. Methods and Function Theory **11** (2011), no 1, 143-160.

96. On a certain generalization of the Carathéodory-Julia-Wolff theorem, Bulletin of the Belgian Math. Soc., **18** (2011), 311–319.

97. *On zeros of certain analytic functions*, Integral Equations Operator Theory **69** (2011), no. 2, 203-215.

98. *Abstract interpolation in vector-valued de Branges-Rovnyak spaces*, Integral Equations Operator Theory **70** (2011), 227–268 (with J.A. Ball and S. ter Horst).

99. *On higher order boundary derivatives of an analytic self-map of the unit disk*, J. Approx. Theory **163** (2011), no. 4, 568–589.

100. *Canonical transfer-function realization for Schur-Agler-class functions of the polydisk*, Oper. Theory Adv. Appl. **218** (2012), 75–123 (with J.A. Ball)

101. *The Nevanlinna–Pick problem on the closed unit disk: Minimal norm rational solutions of low degree*, J. Comp. Appl. Math. **236** (2012), no. 13, 3123–3136 (with S.P. Cameron).

102. *Canonical transfer-function realization for Schur-Agler-class functions on domains with matrix polynomial defining function in* $\mathbf{C}^n$, , Oper. Theory Adv. Appl. **220** (2012), 23–57 (with J.A. Ball).

103. *Canonical transfer-function realization for Schur multipliers on the Drury-Arveson space and models for commuting row contractions*, Indiana Univ. Math. J. **61** (2012), 665–716 (with J.A. Ball).

104. *Boundary asymptotic expansions of analytic self-maps of the unit disk*, Rev. Mat. Iberoam. **29** (2013), no. 1, 353–367 (with N. Zobin)

105. *Inequalities for angular derivatives and boundary interpolation*, Analysis and Math. Physics **3** (2013), no. 1, 63–96 (with M. Elin and D. Shoikhet).

106. *Boundary angular derivatives of generalized Schur functions*, J. Aust. Math. Soc. **93** (2013), no. 3, 203–224 (with T. Wang and J. Weiss).

107. *Weighted Bergman spaces: shift-invariant subspaces and input/state/output linear systems*, Integral Equations Operator Theory **76** (2013), 301–356 (with J.A. Ball).

108. *Weighted Hardy spaces: shift invariant and coinvariant subspaces, linear systems and operator model theory*, Acta Sci. Math. (Szeged) **79** (2013), 623–686 (with J.A. Ball).

109. *Interpolation in sub-Bergman spaces*, Oper. Theory Adv. Appl. **237**, 17–40 (with J.A. Ball).

110. *A Beurling type theorem in weighted Bergman spaces*, Comptes Rendus Mathematique **351** (2013), no. 11, 433–436 (with J. A. Ball).

111. *Lagrange interpolation problem for quaternion polynomials*, C. R. Math. Acad. Sci. Paris **352** (2014), no. 7-8, 577–581.

112. *Pick matrices and quaternionic power series*, Integral Equations Operator Theory **80** (2014), no. 2, 293–302.

113. *System Theory Techniques for Function Theory on Bergman Spaces*, Proceedings of the 21th International Symposium on Mathematical Theory of Networks and Systems (MTNS 2014), pp. 1841–1847, 2015. (with J. A. Ball).

114. *Polynomial interpolation over quaternions*, J. Math. Anal. Appl. **421** (2015), no. 1, 567–590.

115. *Self-mappings of the quaternionic unit ball: multiplier properties, Schwarz-Pick inequality, and Nevanlinna–Pick interpolation problem*, Indiana Univ. Math. J. **64** (2015), 151-180 (with D. Alpay, F. Colombo and I. Sabadini).

116. *Confluent Vandermonde matrices and divided differences over quaternions*, C. R. Math. Acad. Sci. Paris. **353** (2015), no. 5, 391-395.

117. *De Branges-Rovnyak spaces: basics and theory*, a book chapter in *Operator Theory* (Ed. D. Alpay), Springer References in Mathematics & Statistics (with J. A. Ball).

118. De Branges-Rovnyak spaces and norm-constraint interpolation, in *Operator Theory* (Ed. D. Alpay), Springer References in Mathematics & Statistics (with J. A. Ball).

119. *On the expansive property of inner functions in weighted Hardy spaces*, Contemp. Math. **667**, pp. 47–61, Amer. Math. Soc., Providence, RI, 2016 (with J.A. Ball).

120. *On boundary asymptotic expansions of analytic self-mappings of the unit disk*, Ann. Sc. Norm. Super. Pisa Cl. Sci. (5) **15** (2016), 399-433. with D. Shoikhet and M. Elin).

121. *On the Sylvester equation over quaternions*, in *Noncommutative analysis, operator theory and applications* (Ed. D. Alpay, F. Cipriani, F. Colombo, D. Guido, I. Sabadini and J.-L. Sauvageot), pp. 43-75, Oper. Theory Adv. Appl., **252**, Linear Oper. Linear Syst., Birkhäuser/Springer, 2016.

122. *Interpolation problems for certain classes of slice hyperholomorphic functions*, Integral Equations Operator Theory **86** (2016), no. 2, 165-183 (with D. Alpay, F. Colombo and I. Sabadini).

123. *Confluent Vandermonde matrices, divided differences, and Lagrange-Hermite interpolation over quaternions*, Comm. Algebra **45** (2017), no. 2, 575-599.

124. *Contractive multipliers from Hardy space to weighted Hardy space*, Proc. Amer. Math. Soc. **145** (2017), 2411–2425 (with J. A. Ball).

125. *Zeros, factorizations and least common multiples of quaternion polynomials*, J. Algebra and Appl. **16** (2017), no. 10, 1750181, 23 pp.

126. *Divided differences and two-sided polynomial interpolation over quaternions.* in *Advances in complex analysis and operator theory*, pp. 1935, Trends Math., Birkhüser/Springer, Cham, 2017.

127. *The bitangential matrix Nevanlinna-Pick interpolation problem revisited.* in: *Indefinite inner product spaces, Schur analysis, and differential equations*, Oper. Theory Adv. Appl., **263** (2018), 107–161. (with J.A. Ball)

128. *Boundary interpolation by finite Blaschke products*, in: *Complex analysis and dynamical systems*, pp. 39-65, Trends Math., Birkhüser/Springer, Cham, 2018.

129. *Multiplicative Steltjes functions and associated pairs of reproducing kernel Hilbert spaces*, in: *Linear systems, signal processing and hypercomplex analysis* 1–47, Oper. Theory Adv. Appl., **275**, Birkhüser/Springer, Cham, 2019 (with J.A. Ball).

130. *Several inequalities for the Schwarzian derivative of a bounded analytic function*, Complex Var. Elliptic Equ. **64** (2019), no. 7, 1093-1102.

131. *Pseudo-contractions, rigidity, fixed points and related questions*, Anal. Math. Phys. **10** (2020), no. 1, Art. 7, 26 pp.

132. *Interpolation by contractive multipliers between Fock spaces*, Oper. Theory Adv. Appl. **280** (2020), 79–139 (with J.A. Ball).

133. *Finite Blaschke products over quaternions: unitary realizations and zero structure*, Anal. Math. Phys. **10** (2020), no. 4, 39 pp.

134. *Lagrange interpolation over division rings*, Comm. Algebra **48** (2020), no. 9, 4065-4084.

135. *On the Carathéodory-Fejér interpolation problem for Stieltjes functions*, in: *New directions in function theory: from complex to hypercomplex to non-commutative*, pp. 53–85, Operator Theory: Advances and Applications **286**, Birkhúser-Springer, 2021.

136. *On a Sylvester equation over a division ring*, in: *Current Trends in Analysis, its Applications and Computation*, pp. 577–588, Birkhüser, Cham, 2022.

137. *The rational interpolation problem: Grassmanian and Loewner-matrix approaches*, in: *Realization and Model Reduction of Dynamical Systems*, A Festschrift in Honor of Thanos Antoulas, pp. 3–21, Springer, Cham, 2022 (with J.A. Ball).

138. *Cyclic matrices and polynomial interpolation over division rings*, Linear Algebra Appl. **646** (2022), 132–174.

139. *Multivariable Beurling-Lax representations: the commutative and free noncommutative settings*, Acta Sci. Math. (Szeged) **88** (2022), no. 1–2, 5–52 (with J.A. Ball).

140. *Interpolation in multivariable de Branges-Rovnyak spaces*, Oper. Theory Adv. Appl. **290** (2023), 27–88 (with J. A. Ball and S. ter Horst).

141. *On the intersection of left and right ideals in the ring of quaternion polynomials*, J. Algebra Appl. **22**22 (2023), no. 12, Paper No. 2350249, 23 pp.

142. *Weighted Hardy spaces over the unit ball: the freely noncommutative and commutative settings*, Oper. Theory Adv. Appl. **295** (2024) (with J.A. Ball) to appear.

143. *Inequalities for derivatives at fixed points of certain analytic functions on the unit disk*, Rev. Roumaine Math. Pures Appl. (with D. Shoikhet) to appear.

144. *On the Carathéodory-Schur interpolation problem over quaternions*, Adv. Oper. Theory, to appear.

8.4 Other Publications (non-refereed)

1. *Integral representations of the positive definite kernels of the form* $k(t,\tau) = s(t+\tau) + f(t-\tau)$. Ukr.NIINTI, manuscript # 1307 (1984).

2. *Integral representations of a class of descrete positive definite kernels.* Ukr.NIINTI, manuscript # 2093 (1985).

3. *Parametrization of the J-elementary multiple factor of incomplete rank with the pole at the boundary of a domain.* Ukr.NIINTI, manuscript # 2097 (1985).

4. *Schur algorithm for degenerate matrix moment problems.* Ukr.NIINTI, manuscript # 1097 (1987)

5. *On bitangential interpolation problem in the Stieltjes class.* VINITI, manuscript # 3848 (1989).

6. *Bitangential Carathéodory–Féjer problem in the Stieltjes class.* VINITI, manuscript # 2478 (1990).

8.5 Papers of undergraduates written under my supervision

1. T. Wang and J. Weiss, *Nevanlinna–Pick interpolation by rational functions with a single pole inside the unit disk*, Comp. Appl. Math. **236** (2012), no. 13, 3123–3136.

8.6 Volumes edited

1. *Topics in operator theory: Operators, Matrices and Analytic Functions*, Operator Theory: Advances and Applications **202**, Basel: Birkhäuser, 2010.

2. *Topics in operator theory: Systems and mathematical physics*, Operator Theory: Advances and Applications **203**, Basel: Birkhäuser, 2010.

3. *Interpolation and Realization Theory with Applications to Control Theory*, Operator Theory: Advances and Applications **272**, Basel: Birkhäuser, 2019.

8.7 Conferences talks

1993
- The annual meeting of Israel Math. Society, Beer–Sheva,
- VIII Haifa matrix conference, Haifa,

1994
- IV International Linear Algebra Society conference, Rotterdam,
- V Conference on Schur analysis, Leipzig,

1995
- II Congress on Industrial and Applied Mathematics, Hamburg
- IX Haifa matrix conference, Haifa,
- IWOTA-95, Regensburg,
- VI Conference on Schur analysis, Leipzig,

1997
- Conference on operator theory in honour of M. Livshits, Beer-Sheva,
- VII conference on Schur analysis, Leipzig,

1998
- The annual meeting of Israel Math. Society, Jerusalem,
- IWOTA-98, Groningen,
- Virginia operator theory and complex analysis meeting (Richmond, VA)

2001
- SouthEastern Analysis Meeting SEAM-17 (Athens, GA)
- SIAM Conference on Signals, Systems and Control (Boston, MA)
- Trends in Banach Spaces and Operator Theory (Memphis, TN),

2002
- South Eastern Analysis Meeting, Chapell Hill,
- Sectional meeting of the AMS (Atlanta, GA),
- The X-th International Linear Algebra Society conference (Auburn, AL),
- Great Plains Operator Theory Symposium (Charlotte, NC)
- International Workshop on Operator Theory and its Applications IWOTA-2002 (Blacksburg, VA),
- MTNS (Mathematical Theory of Networks and Systems) (South Bend, IN),

2003
- South Eastern Analysis Meeting (Knoxville, KY)
- SIAM meeting on Applied Linear Algebra (Williamsburg, VA).
- International Conference on Matrix Analysis (Fort Lauderdale FL),

2005
- South Eastern Analysis Meeting (Lexington, VA)

International Workshop on Operator Theory and its Applications (Storrs, CT)
- Virginia Operator Theory and Complex Analysis Meeting, (Charlottesville, VA)

2006
- International Conference on Matrix Analysis (Fort Lauderdale, FL),

2007
- South Eastern Analysis Meeting, Richmond,
- Classical Analysis conference (Chapel Hill, NC).

2008
- International Workshop on Operator Theory and its Applications

• MTNS (Mathematical Theory of Networks and Systems), Blacksburg

2009 • Workshop on Multivariable Operator Theory, Fields Institute, Toronto.

2010 • Workshop "Open problems in Complex dynamics", Karmiel
• Annual meeting of the Israeli Mathematical Union, Rehovot
• Virginia Operator Theory and Complex Analysis Meeting, Richmond..

2012 • Special Session at the Joint AMS-MAA Meetings (Boston)
• Conference on Operator theory and Operator Algebras (Beer Sheva),

2013 • Special Session at the Joint AMS-MAA Meetings (San Diego)
• Complex Analysis and Dynamical Systems (Nahariya)
• International Linear Algebra Society conference (Providence)

2014 • Noncommutative Analysis Operator Theory and Applications (Milan)

2016 • International Workshop on Operator Theory and its Applications (St Louis, MO)
• International Conference on Complex Analysis and Operator Theory (Chapman University, CA)

2017 • Mathematics, Signal Processing and Linear Systems: New Problems and Directions (Chapman University, CA)

2018 • South Eastern Analysis Meeting (Georgia Tech, Atlanta)
• Perspectives in Modern Analysis (Holon Institute of Technology, Israel)
• Advances in Operator Theory with Applications to Mathematical Physics (Chapman University, CA)

2019 • 30th International Workshop on Operator Theory and its Applications (Instituto Superior Tecnico, Lisbon, Portugal)
• 12th International ISAAC Congress (University of Aveiro, Portugal)
• New Directions in Function Theory: From Complex to Hypercomplex to Non-Commutative (Chapman University, CA)

2020 • Special Session at the Joint AMS-MAA Meetings (Denver)

2022 • Workshop on Operator Theory with an eye on Linear Systems and Hypercomplex Analysis (May, Chapman University, CA)
• Advances in Operator Theory with Applications to Mathematical Physics (November, Chapman University, CA)

2023 • International Linear Algebra Society conference (Madrid, Spain)

2024 •Workshop on Schur Analysis and applications to Hypercomplex Analysis, Neural Networks and Linear Systems (January, Chapman University, CA)

9 Professional service

1. Reviewer for the AMS Mathematical Reviews (**118** reviews) and for Zentralblatt MATH (**13** reviews).

2. Referee for

   "Abstract and Applied Analysis ",

   "Acta Scientarium Mathematicarum (Szeged)"

   "Advances in Applied Clifford Algebras"

   "Advances in Mathematics"

   "Advances in Operator Theory"

   "Analysis and Mathematical Physics"

   "Applied Mathematics and Computation"

   "Applied Mathematics Letters",

   "Bollettino dell'Unione Matematica Italiana",

   "Bulletin of the London Mathematical Society",

   "Complex Analysis and Operator Theory",

   "Complex Variables and Elliptic Equations",

   "Communications in Mathematical Analysis"

   "Contemporary Mathematics",

   "Electronic Transactions on Numerical Analysis"

   "Fuctiones et Approximatio",

   "IEEE Transactions on Automatic Control",

   "Indian Journal of Pure and Applied Mathematics",

   "Indiana University Mathematics Journal"

   "Integral Equations and Operator Theory",

   "International Journal of Mathematics",

   "International Mathematics Research Notices"

   "Journal d'Analyze Mathematique"

   "Journal of Computational and Applied Mathematics",

   "Journal of Functional Analysis",

"Journal of Function Spaces and Applications"

"Journal of Indian Mathematical Society",

"Journal of London Mathematical Society"

"Journal of Mathematical Analysis and Applications",

"Linear Algebra and Applications",

"Linear and Multilinear Algebra",

"Mathematicheskij Sbornik"

"Mathematische Annalen"

"Mathematische Nachrichten",

"Memoirs of the American Mathematical Society",

"Milan Journal of Mathematics"

"Operators and Matrices",

"Operator Theory: Advances and Applications",

"Positivity"

"Proceedings of the American Mathematical Society",

"Proceedings of Edinburgh Mathematical Society",

"Quaestiones Mathematicae",

"Studia Mathematica"

"Systems and Control Letters"

"Transactions of the American Mathematical Society"

3. Refereed proposals for the Austrian National Science Foundation, Israeli National Science Foundation, Israel-USA Binational Science Foundation.

4. Served as an outside reviewer for seven tenure and promotion cases.

5. Served as an outside reviewer for a Ph.D. thesis (North-West University, Potchefstroom, South Africa)

6. Organizer or co-organizer of special Sessions at the IV-th SIAM Conference on Linear Algebra in Signals, Systems and Control (Boston, MA, August 2001), IWOTA (Blacksburg, VA, August 2002), MTNS (Blacksburg, VA, August 2008), ILAS (Providence, RI, June 2013), IWOTA (Lisbon, 2019), IWOTA (Chapman, 2021).

7. Co-organizer of the International workshop on operator theory and applications (IWOTA, Williamsburg, 2008).

8. Co-organizer of the South-Eastern Analysis Meeting (2021).

9. A member of the Steering Committee of IWOTA.

10 Service within the College

1. Pure Mathematics Unit Director (2014-)
2. Departmental Merit Evaluation Committee (2003–2005, 2007–2008, 2012–2013)
3. Departmental Personnel Committee (Fall 2006–Spring 2007, Fall 2008–Spring 2011, Fall 2012–Spring 2014)
4. Departmental DEI Committee (Chair, 2020-)
5. Departmental Curriculum Committee (2022–2023)
6. Hiring Committees (2006, 2007, 2008, 2014, 2016, 2018, 2021, 2023)
7. Students' advising (since 2005): freshmen/sophomore advising and primary major advising.
8. Participated in Summer REU Programs (2002, 2003, 2011).
9. Served on 7 Honors Theses committees (for Departments of Mathematics, Physics, Chemistry and Computer Science).
10. AD hoc committee to update handbook at the Department of Mathematics (Fall, 2000)
11. Space committee at the Department of Mathematics (2000–2010)
12. Admissions Liaison Committee and Goldwater Advisor (2002)
13. Library (SWEM) representative at the Mathematics Department (Fall 2002–Spring 2005)