

James Rovnyak
Curriculum Vitae

I. Education

B.A., Lafayette College, 1960
M.A., Yale University, 1962
Ph.D., Yale University, 1963

II. Employment

Assistant Professor, Purdue University, 1963
Associate Professor, University of Virginia, 1967
Professor, University of Virginia, 1974; Chair, 1974–75
Professor Emeritus, University of Virginia, 2005

Visiting positions:

Institute for Advanced Study, Princeton, 1966–67
Institute for Defense Analyses, Princeton, 1968 (summer)
Rhein.-Westf. Techn. Hochschule Aachen and Universität Tübingen, 1979–80
University College London, 1984–85, 1991 (spring), 2002 (spring)
Mathematical Sciences Research Institute, Berkeley, 1995 (fall)
Ben-Gurion University of the Negev, Israel, 1996 (summer)

III. Professional

My research area is operator theory and analysis. I gratefully acknowledge generous support from the National Science Foundation up to my retirement in 2005.

Member: *American Mathematical Society*

Reviewer for *Mathematical Reviews*, 1963–.

Co-Chair: AMS Library Committee, 1990–1997

U.S. Senior Scientist Award (Humboldt Prize), F.R. Germany, 1979–1980

Special Libraries Association Physics–Astronomy–Mathematics Award, 1994

Editorial board: *Integral Equations and Operator Theory*

IV. Doctoral students

Bruce Call Orcutt, 1969

Canonical Differential Equations

Victor Wayne Daniel, 1970

Invariant Subspaces of Convolution Operators

Richard Eugene Sours, 1971

Vectorial Toeplitz Operators

Richard Edward Frankfurt, 1974

Spectral Analysis of Finite Convolution Operators

Larry Thomas Hill, 1979

Spectral Analysis of Finite Convolution Operators with Matrix Kernels

Steven Michael Seubert, 1987

Semigroups of Finite Convolution Operators

Michael Anthony Dritschel, 1989

Extension Theorems for Operators on Kreĭn Spaces

Darryl Arthur Linde, 1990

Some Operators on the Newton Spaces

Gene Barton Christner, 1993

Applications of the Extension Properties of Operators on Kreĭn Spaces

Troy James Siemers, 1999

Some Kreĭn Space Realizations of Generalized Schur Functions

Christian John Hellings, 2000

Two-Isometries on Pontryagin Spaces

V. Some invited lectures

The operator Fejér-Riesz theorem, International Workshop on Operator Theory and its Applications, Berlin 2010

Generalized difference kernels having a finite number of negative squares, International Workshop on Operator Theory and its Applications, Williamsburg, July 2008.

Operator identities in the study of canonical differential systems, Modern Analysis and Applications, Odessa, April 2007

Inverse problems for canonical differential equations with singularities, International Workshop on Operator Theory and its Applications, Storrs, July 2005

Indefinite cases of operator identities which arise in interpolation theory, International Workshop on Operator Theory and its Applications, Newcastle upon Tyne, July 2004

Spectral problems for some indefinite generalizations of canonical differential and difference equations, International Workshop on Operator Theory and its Applications, Blacksburg, August 2002

On Darlington representations of generalized Schur functions, Newcastle Operator Theory Day, Newcastle upon Tyne, March 2002

Nudel'man's problem and interpolation in the generalized Schur class, colloquium lecture, University College London, February 2002; Yorkshire Functional Analysis Group, York University, May 2002.

Monotone and almost monotone matrix functions of a matrix argument, Minisymposium on Operator Theory and Systems, SIAM Control Conference, San Diego, July 2001

Recent trends in Kreĭn space operator theory, biennial Toeplitz lecturer, Tel Aviv, March 1999

VI. Publications

BOOKS

1. L. de Branges and J. Rovnyak, *Square summable power series*, Holt, Rinehart and Winston, New York, 1966.
2. M. Rosenblum and J. Rovnyak, *Hardy classes and operator theory*, Oxford Mathematical Monographs, Oxford University Press, New York, 1985. Reprinted by Dover, Mineola, NY, 1997.
3. M. Rosenblum and J. Rovnyak, *Topics in Hardy classes and univalent functions*, Birkhäuser Advanced Texts, Birkhäuser Verlag, Basel, 1994.
4. D. Alpay, A. Dijksma, J. Rovnyak, and H. S. V. de Snoo, *Schur functions, operator colligations, and reproducing kernel Pontryagin spaces*, Oper. Theory Adv. Appl., vol. 96, Birkhäuser Verlag, Basel, 1997.

PAPERS

1. J. Rovnyak, *Ideals of square summable power series*, Math. Mag. **33** (1959/1960), 265–270.
2. J. Rovnyak, *Ideals of square summable power series*, Proc. Amer. Math. Soc. **13** (1962), 360–365.
3. L. de Branges and J. Rovnyak, *The existence of invariant subspaces*, Bull. Amer. Math. Soc. **70** (1964), 718–721. *Correction to “The existence of invariant subspaces,”* ibid. **71** (1965), 396.
4. J. Rovnyak, *Ideals of square summable power series. II*, Proc. Amer. Math. Soc. **16** (1965), 209–212.
5. L. de Branges and J. Rovnyak, *Canonical models in quantum scattering theory*, Perturbation Theory and its Applications in Quantum Mechanics (Proc. Adv. Sem. Math. Res. Center, U.S. Army, Theoret. Chem. Inst., Univ. of Wisconsin, Madison, Wis., 1965) (New York), Wiley, 1966, pp. 295–392.
6. J. Rovnyak and V. Rovnyak, *Self-reciprocal functions for the Hankel transformation of interger order*, Duke Math. J. **34** (1967), 771–785.
7. J. Rovnyak and V. Rovnyak, *Sonine spaces on entire functions*, J. Math. Anal. Appl. **27** (1969), 68–100.
8. J. D. Pincus and J. Rovnyak, *A representation theorem for determining functions*, Proc. Amer. Math. Soc. **22** (1969), 498–502.
9. J. D. Pincus and J. Rovnyak, *A spectral theory for unbounded self-adjoint singular integral operators*, Amer. J. Math. **91** (1969), 619–636.
10. M. Rosenblum and J. Rovnyak, *Factorization of operator valued entire functions*, Bull. Amer. Math. Soc. **75** (1969), 1343–1346.
11. J. Rovnyak, *On the theory of unbounded Toeplitz operators*, Pacific J. Math. **31** (1969), 481–496.
12. J. Rovnyak, *The Hilbert matrix as a singular integral operator*, Acta Sci. Math. (Szeged) **31** (1970), 347–350.

13. M. Rosenblum and J. Rovnyak, *Factorization of operator valued entire functions*, Indiana Univ. Math. J. **20** (1970/1971), 157–173.
14. M. Rosenblum and J. Rovnyak, *An algebraic approach to the factorization problem for non-negative Toeplitz operators*, Indiana Univ. Math. J. **20** (1971), no. 10, 939–940.
15. M. Rosenblum and J. Rovnyak, *The factorization problem for nonnegative operator valued functions*, Bull. Amer. Math. Soc. **77** (1971), 287–318.
16. J. Rovnyak, *The absolutely continuous component of a selfadjoint Toeplitz operator*, Indiana Univ. Math. J. **21** (1971/1972), 751–757.
17. M. Rosenblum and J. Rovnyak, *Two theorems on finite Hilbert transforms*, J. Math. Anal. Appl. **48** (1974), 708–720.
18. M. Rosenblum and J. Rovnyak, *Restrictions of analytic functions. I*, Proc. Amer. Math. Soc. **48** (1975), 113–119.
19. M. Rosenblum and J. Rovnyak, *Restrictions of analytic functions. II*, Proc. Amer. Math. Soc. **51** (1975), 335–343.
20. M. Rosenblum and J. Rovnyak, *Restrictions of analytic functions. III*, Proc. Amer. Math. Soc. **52** (1975), 222–226.
21. B. Moore, M. Rosenblum, and J. Rovnyak, *Toeplitz operators associated with isometries*, Proc. Amer. Math. Soc. **49** (1975), 189–194.
22. R. Frankfurt and J. Rovnyak, *Finite convolution operators*, J. Math. Anal. Appl. **49** (1975), 347–374.
23. M. Rosenblum and J. Rovnyak, *Cayley inner functions and best approximation*, J. Approximation Theory **17** (1976), no. 3, 241–253.
24. R. Frankfurt and J. Rovnyak, *Recent results and unsolved problems on finite convolution operators*, Linear spaces and approximation (Proc. Conf., Math. Res. Inst., Oberwolfach, 1977) (Basel), Internat. Schriftenreihe Numer. Math., vol. 40, Birkhäuser, 1978, pp. 133–150.
25. M. Rosenblum and J. Rovnyak, *Change of variables formulas with Cayley inner functions*, Topics in functional analysis (essays dedicated to M. G. Kreĭn on the occasion of his 70th birthday) (New York), Adv. in Math. Suppl. Stud., vol. 3, Academic Press, 1978, pp. 283–320.
26. M. Rosenblum and J. Rovnyak, *An operator-theoretic approach to theorems of the Pick-Nevanlinna and Loewner types. I*, Integral Equations Operator Theory **3** (1980), no. 3, 408–436.
27. M. Rosenblum and J. Rovnyak, *An operator-theoretic approach to theorems of the Pick-Nevanlinna and Loewner types. II*, Integral Equations Operator Theory **5** (1982), no. 6, 870–887.
28. J. Rovnyak, *A converse to von Neumann's inequality*, Proc. Amer. Math. Soc. **84** (1982), no. 3, 370–372.
29. J. Rovnyak, *Optimal approximants and Szegő's infimum*, Anniversary volume on approximation theory and functional analysis (Oberwolfach, 1983) (Basel), Internat. Schriftenreihe Numer. Math., vol. 65, Birkhäuser, 1984, pp. 329–334.

30. J. M. Anderson, M. Rosenblum, and J. Rovnyak, *Hilbert space extremal problems with constraints*, J. London Math. Soc. (2) **31** (1985), no. 3, 517–525.
31. C. Markett, M. Rosenblum, and J. Rovnyak, *A Plancherel theory for Newton spaces*, Integral Equations Operator Theory **9** (1986), no. 6, 831–862.
32. J. Rovnyak, *Note on characteristic polynomials*, Amer. Math. Monthly **94** (1987), no. 3, 289–290.
33. J. M. Anderson, J. G. Clunie, M. Rosenblum, and J. Rovnyak, *Some problems of best approximation with constraints*, J. Approx. Theory **52** (1988), no. 1, 82–106.
34. J. Rovnyak, *Euler spaces of analytic functions*, Trans. Amer. Math. Soc. **308** (1988), no. 1, 197–208.
35. J. Rovnyak, *Coefficient estimates for Riemann mapping functions*, J. Analyse Math. **52** (1989), 53–93.
36. J. Rovnyak, *Operator-valued analytic functions of constant norm*, Czechoslovak Math. J. **39(114)** (1989), no. 1, 165–168.
37. J. Rovnyak, *A vector extension of Loewner's differential equation*, Linear operators in function spaces (Timișoara, 1988), Oper. Theory Adv. Appl., vol. 43, Birkhäuser, Basel, 1990, pp. 301–308.
38. M. A. Dritschel and J. Rovnyak, *Extension theorems for contraction operators on Kreĭn spaces*, Extension and interpolation of linear operators and matrix functions, Oper. Theory Adv. Appl., vol. 47, Birkhäuser Verlag, Basel, 1990, pp. 221–305.
39. J. Rovnyak, *Ernst David Hellinger 1883–1950: Göttingen, Frankfurt idyll, and the New World*, Topics in operator theory: Ernst D. Hellinger memorial volume (Basel), Oper. Theory Adv. Appl., vol. 48, Birkhäuser, 1990, pp. 1–41.
40. C. Markett and J. Rovnyak, *An incomplete gamma transform and applications to factorial series*, Analysis **12** (1992), no. 1-2, 159–186.
41. M. A. Dritschel and J. Rovnyak, *Julia operators and complementation in Kreĭn spaces*, Indiana Univ. Math. J. **40** (1991), no. 3, 885–901.
42. Kin Y. Li and J. Rovnyak, *On the coefficients of Riemann mappings of the unit disk into itself*, Contributions to operator theory and its applications (Basel), Oper. Theory Adv. Appl., vol. 62, Birkhäuser, 1993, pp. 145–163.
43. G. Christner, Kin Y. Li, and J. Rovnyak, *Julia operators and coefficient problems*, Nonselfadjoint operators and related topics (Beer Sheva, 1992) (Basel), Oper. Theory Adv. Appl., vol. 73, Birkhäuser, 1994, pp. 138–181.
44. D. Dreibelbis, J. Rovnyak, and Kin Y. Li, *Coefficients of bounded univalent functions*, Proceedings of the Conference on Complex Analysis (Tianjin, 1992) (Cambridge, MA), Conf. Proc. Lecture Notes Anal., I, Internat. Press, 1994, pp. 45–58.
45. G. Christner and J. Rovnyak, *Julia operators and the Schur algorithm*, Harmonic analysis and operator theory (Caracas, 1994) (Providence, RI), Contemp. Math., vol. 189, Amer. Math. Soc., 1995, pp. 135–160.
46. M. A. Dritschel and J. Rovnyak, *Operators on indefinite inner product spaces*, Lectures on operator theory and its applications (Waterloo, ON, 1994), Fields Inst. Monogr., vol. 3, Amer. Math. Soc., Providence, RI, 1996, pp. 141–232.

47. D. Alpay, A. Dijksma, J. Rovnyak, and H. S. V. de Snoo, *Fonctions de Schur, colligations d'opérateurs, et espaces de Pontryagin à noyau reproduisant*, C. R. Acad. Sci. Paris Sér. I Math. **322** (1996), no. 1, 15–20.
48. D. Alpay, A. Dijksma, J. Rovnyak, and H. S. V. de Snoo, *Reproducing kernel Pontryagin spaces*, Holomorphic Spaces, eds. S. Axler, J. McCarthy, and D. Sarason, pp. 425–444, Math. Sci. Res. Inst. Publ., vol. 33, Cambridge University Press, 1998.
49. D. Alpay and J. Rovnyak, *Loewner's theorem for kernels having a finite number of negative squares*, Proc. Amer. Math. Soc., **127** (1999), no. 4, 1109–1117.
50. D. Alpay, V. Bolotnikov, A. Dijksma, J. Rovnyak and C. Sadosky, *Hilbert spaces contractively included in the Hardy space of the bidisk*, C. R. Acad. Sci. Paris Sér. I Math. **326** (1998), 1365–1370.
51. D. Alpay, A. Dijksma, J. Rovnyak, and H. S. V. de Snoo, *Realization and factorization in reproducing kernel Pontryagin spaces*, Operator theory, system theory and related topics. The Moshe Livšic anniversary volume (D. Alpay and V. Vinnikov, eds.), Oper. Theory Adv. Appl., vol. 123, Birkhäuser, Basel, 2001, pp. 43–65.
52. D. Alpay, V. Bolotnikov, A. Dijksma, and J. Rovnyak, *Some extensions of Loewner's theory of monotone operator functions*, J. Funct. Anal. **189** (2002), no. 1, 1–20.
53. J. Rovnyak, *Methods of Kreĭn space operator theory*, Interpolation theory, systems theory, and related topics, Oper. Theory Adv. Appl., vol. 134, Birkhäuser, Basel, 2002, pp. 31–66.
54. D. Alpay, T. Constantinescu, A. Dijksma, and J. Rovnyak, *Notes on interpolation in the generalized Schur class. I. Applications of realization theory*, Interpolation theory, systems theory, and related topics, Oper. Theory Adv. Appl., vol. 134, Birkhäuser, Basel, 2002, pp. 67–97.
55. D. Alpay, T. Ya. Azizov, A. Dijksma, and J. Rovnyak, *Colligations in Pontryagin spaces with a symmetric characteristic function*, Linear operators and matrices, Oper. Theory Adv. Appl., vol. 130, Birkhäuser, Basel, 2002, pp. 55–82.
56. J. Rovnyak and L. A. Sakhnovich, *Some indefinite cases of spectral problems for canonical systems of difference equations*, Linear Algebra Appl. **343/344** (2002), 267–289.
57. D. Z. Arov and J. Rovnyak, *On Darlington representations of generalized Schur functions*, appendix in D. Z. Arov: *Stable dissipative linear stationary dynamical scattering systems*, Interpolation theory, systems theory and related topics (Tel Aviv/Rehovot, 1999), Oper. Theory Adv. Appl., vol. 134, Birkhäuser, Basel, 2002, Translated from the Russian [J. Operator Theory **2** (1979), no. 1, 95–126], pp. 99–136.
58. D. Alpay, T. Constantinescu, A. Dijksma, and J. Rovnyak, *Notes on interpolation in the generalized Schur class. II. Nudel'man's problem*, Trans. Amer. Math. Soc. **355** (2003), no. 2, 813–836.
59. J. Rovnyak and L. A. Sakhnovich, *Spectral problems for some indefinite cases of canonical differential equations*, J. Operator Theory **51** (2004), no. 1, 115–139.
60. D. Alpay, A. Dijksma, and J. Rovnyak, *Un théorème de type Beurling-Lax dans la boule unité*, C. R. Math. Acad. Sci. Paris **324** (2002), no. 5, 349–354.

61. D. Alpay, A. Dijksma, and J. Rovnyak, *A theorem of Beurling-Lax type for Hilbert spaces of functions analytic in the unit ball*, Integral Equations Operator Theory **47** (2003), no. 3, 251–274.
62. J. Rovnyak and L. A. Sakhnovich, *On the Kreĭn-Langer integral representation of generalized Nevanlinna functions*, Electronic Journal of Linear Algebra **11** (2004), 1–15.
63. D. Z. Arov, J. Rovnyak, and S. M. Sapirokin, *Linear passive stationary scattering systems with Pontryagin state spaces*, Math. Nachr. **279** (2006), no. 13–14, 1396–1424.
64. J. Rovnyak and L. A. Sakhnovich, *On indefinite cases of operator identities which arise in interpolation theory*, IWOTA 2004 proceedings, Oper. Theory Adv. Appl. 171 (2006), 281–322.
65. J. M. Anderson and J. Rovnyak, *On generalized Schwarz-Pick estimates*, Matematika 53 (2006), 161–168.
66. J. Rovnyak and L. A. Sakhnovich, *Inverse problems for canonical differential equations with singularities*, IWOTA 2005 proceedings, Oper. Theory Adv. Appl. 179 (2007), 257–288.
67. J. Rovnyak and L. A. Sakhnovich, *Interpolation problems for matrix integro-differential operators with difference kernels and with a finite number of negative squares*, Operator Theory, Structured Matrices, and Dilations: Tiberiu Constantinescu Memorial Volume, Theta Foundation, Bucharest, 2007, 325–340.
68. J. Rovnyak and L. A. Sakhnovich, *Integral representations for generalized difference kernels having a finite number of negative squares*, Integral Equations Operator Theory, **63** (2009), no. 2, 281–296.
69. J. M. Anderson, M. A. Dritschel, and J. Rovnyak, *Schwarz-Pick inequalities for the Schur-Agler class on the polydisk and unit ball*, Comput. Methods Funct. Theory **8** (2008), no. 2, 339–361.
70. J. Rovnyak and L. A. Sakhnovich, *Pseudospectral functions for canonical differential systems*, Modern Analysis and Applications: The Mark Krein Centenary Conference, Vol. 2, Oper. Theory Adv. Appl. 191 (2009), 187–219.
71. J. Rovnyak and M. A. Dritschel, *The operator Fejér-Riesz theorem*, A Glimpse at Hilbert Space Operators. Paul R. Halmos in Memoriam, Oper. Theory Adv. Appl. 207 (2010), 223–254.

UNPUBLISHED

1. J. Rovnyak, *Characterization of $\mathcal{H}(M)$ spaces*, 1968; an electronic version is available at: <http://people.virginia.edu/~jlr5m/papers/papers.html>

MISCELLANEOUS PUBLICATIONS

1. J. Rovnyak, *Commentary on the Rota model*, published in *Gian-Carlo Rota on analysis and probability*, pp. 93–96. Birkhäuser Boston, Boston, MA, 2003.

2. H. S. V. de Snoo and J. Rovnyak, *Schur functions in complex function theory*, Encyclopaedia of Mathematics, Supplement Volume II, pp. 411–413, Kluwer, Dordrecht, The Netherlands, 2000.
3. J. Rovnyak, *The Fejér-Riesz theorem*, Encyclopaedia of Mathematics, Supplement Volume I, pp. 248–249, Kluwer, Dordrecht, The Netherlands, 1997.
4. N. D. Anderson, K. Dilcher, and J. Rovnyak, *Mathematics research libraries at the end of the twentieth century*, Notices of the Amer. Math. Soc. **44**, no. 11, (1997), 1469–1472; Canadian Mathematical Society Notes **29**, no. 8 (1997), 44–47.
5. J. Rovnyak, review of *Sub-Hardy Hilbert spaces*, by D. Sarason (Lecture Notes in the Mathematical Sciences, vol. 10, Wiley, New York, 1994, xiv+95 pp.), published in Bull. Amer. Math. Soc. **33** (N.S.) (1996), 81–85.
6. J. Rovnyak, review of *Schur's algorithm and several applications*, by M. Bakonyi and T. Constantinescu (Pitman Research Notes, vol. 261, Longman Scientific and Technical, 1992, 190 pp.; copublished in the U. S. by John Wiley & Sons), published in Bull. Amer. Math. Soc. **30** (N.S.) (1994), 270–276.
7. N. D. Anderson and J. Rovnyak, *Mathematics research libraries: a 1990 snapshot*, Notices of the Amer. Math. Soc. **28**, no. 10, (1991), 1258–1262.
8. J. Rovnyak, review of *E. B. Christoffel, The Influence of His Work on Mathematics and the Physical Sciences*, eds. P. L. Butzer and F. Fehér, Birkhäuser, Basel, 1981. xxvi+762 pp., published in Science, 9 July 1982, vol. **217**, no. 4555.

EDITING

1. Co-Editor, *Topics in operator theory: Ernst D. Hellinger memorial volume*, Oper. Theory Adv. Appl., vol. 48, Birkhäuser, Basel, 1990.
2. Editor, M. B. Abrahamse Mathematical Papers, published privately in 2001.
3. Co-editor, *Recent Advances in Matrix and Operator Theory (IWOTA 2005 proceedings)*, Oper. Theory Adv. Appl., vol. 179, Birkhäuser, Basel, 2007.
4. Co-editor, *Operator Theory, Structured Matrices, and Dilations: Tiberiu Constantinescu Memorial Volume*, Theta Foundation, Bucharest, 2007.