References

[1] E. Abakumov and K. Y. Fedorovskiy, Analytic balayage of measures, Carathéodory domains, and badly approximable functions in L^p. *C. R. Math. Acad. Sci. Paris* **356** (2018), no. 8, 870–874

[2] A. V. Abanin and L. H. Khoi, Cauchy transformation and mutual dualities between $A^{-\infty}(\Omega)$ and $A^{\infty}(\Omega^{\complement})$ for Carathéodory domains. *Bull. Belg. Math. Soc. Simon Stevin* **23** (2016), no. 1, 87–102

[3] F. G. Abdullaev and A. A. Dovgoshei, Szegö theorem, Carathéodory domains and boundedness of calculating functionals. *Math. Notes* **77** (2005), no. 1, 3–14

[4] J. T. Anderson, J. A. Cima, N. Levenberg, and T. J. Ransford, Projective hulls and characterizations of meromorphic functions. *Indiana Univ. Math. J.* **61** (2012), no. 6, 2111–2122

[5] N. U. Arakeljan, Uniform approximation on closed sets by entire functions. *Izv. Akad. Nauk SSSR Ser. Mat.* **28** (1964), 1187–1206

[6] S. Axler, Harmonic functions from a complex analysis viewpoint. *Amer. Math. Monthly* **93** (1986), no. 4, 246–258

[7] S. Banach, *Théorie des opérations linéaires*. Chelsea, New York, 1955

[8] A. D. Baranov, J. J. Carmona, and K. Y. Fedorovskiy, Density of certain polynomial modules. *J. Approx. Theory* **206** (2016), 1–16

[9] A. D. Baranov and K. Y. Fedorovskiy, Boundary regularity of Nevanlinna domains and univalent functions in model subspaces. *Sb. Math.* **202** (2011), no. 12, 1723–1740

[10] A. D. Baranov and K. Y. Fedorovskiy, On L^1-estimates of derivatives of univalent rational functions. *J. Anal. Math.* **132** (2017), 63–80

[11] S. Y. Belov and K. Y. Fedorovskiy, Model spaces containing univalent functions. *Russ. Math. Surverys* **73** (2018), no. 1, 172–174

[12] Y. Belov, A. Borichev, and K. Y. Fedorovskiy, Nevanlinna domains with large boundaries. *J. Funct. Anal.* **277** (2019), no. 8, 2617–2643

[13] E. Bishop, Measures orthogonal to polynomials. *Proc. Natl. Acad. Sci. USA* **44** (1958), no. 3, 278–280

[14] E. Bishop, The structure of certain measures. *Duke Math. J.* **25** (1958), 283–289

[15] E. Bishop, Boundary measures of analytic differentials. *Duke Math. J.* **27** (1960), 331–340

[16] A. Boivin, P. M. Gauthier, and P. V. Paramonov, On uniform approximation by n-analytic functions on closed sets in $\mathbb{C}$. *Izv. Math.* **68** (2004), no. 3, 447–459

[17] P. S. Bourdon, Density of the polynomials in Bergman spaces. *Pacific J. Math.* **130** (1987), no. 2, 215–221

[18] S. Browder, *Introduction to function algebras*. W. A. Benjamin, New York-Amsterdam, 1969

[19] R. B. Burckel, *An introduction to classical complex analysis. Vol. 1*. Pure Appl. Math. 82, Academic Press, Harcourt Brace Jovanovich, New York-London, 1979

[20] C. Carathéodory, Untersuchungen über die konformen Abbildungen von festen und veränderlichen Gebieten. *Math. Ann.* **72** (1912), no. 1, 107–144

[21] C. Carathéodory, Über die Begrenzung einfach zusammenhängender Gebiete. *Math. Ann.* **73** (1913), no. 3, 323–370

[22] C. Carathéodory, Über die gegenseitige Beziehung der Ränder bei der konformen Abbildung des Inneren einer Jordanschen Kurve auf einen Kreis. *Math. Ann.* **73** (1913), no. 2, 305–320

[23] T. Carleman, Über die Approximation analytischer Funktionen durch lineare Aggregate von vorgegebenen Potenzen. *Arkiv. Mat. Astron. Fys.* **17** (1922), no. 9, 1–30

[24] L. Carleson, Mergelyan's theorem on uniform polynomial approximation. *Math. Scand.* **15** (1964), 167–175

[25] J. J. Carmona, Mergelyan's approximation theorem for rational modules. *J. Approx. Theory* **44** (1985), no. 2, 113–126

[26] J. J. Carmona and K. Y. Fedorovskiy, Conformal maps and uniform approximation by polyanalytic functions. In *Selected topics in complex analysis*, pp. 109–130, Oper. Theory Adv. Appl. 158, Birkhäuser, Basel, 2005

[27] J. J. Carmona and K. Y. Fedorovskiy, New conditions for uniform approximation by polyanalytic polynomials. *Proc. Stelklov Inst. Math.* **279** (2012), 215–229

[28] J. J. Carmona, K. Y. Fedorovskiy, and P. V. Paramonov, On uniform approximation by polyanalytic polynomials and the Dirichlet problem for bianalytic functions. *Sb. Math.* **193** (2002), no. 10, 1469–1492

[29] J. J. Carmona and C. Pommerenke, On the argument oscillation of conformal maps. *Michigan Math. J.* **46** (1999), no. 2, 297–312

[30] J. J. Carmona and C. Pommerenke, Decomposition of continua and prime ends. *Comput. Methods Funct. Theory* **3** (2003), no. 1-2, 253–272

[31] J. G. Caughran, Polynomial approximation and spectral properties of composition operators on H^2. *Indiana Univ. Math. J.* **21** (1971), 81–84

[32] E. F. Collingwood and A. J. Lohwater, *The theory of cluster sets*. Cambridge Tracts in Math. Phys. 56, Cambridge University Press, Cambridge, 1966

[33] J. B. Conway, *Functions of one complex variable. I*. 2nd edn., Grad. Texts in Math. 11, Springer, New York-Berlin, 1978

[34] J. B. Conway, *The theory of subnormal operators*. Math. Surveys Monogr. 36, American Mathematical Society, Providence, RI, 1991

[35] P. Davis, *The Schwarz function and its applications*. Carus Math. Monogr. 17, Mathematical Association of America, Buffalo, NY, 1974

[36] J. Deny, Sur l'approximation des fonctions harmoniques. *Bull. Soc. Math. France* **73** (1945), 71–73

[37] A. A. Dovgoshei, Polynomial approximation of functions from Hardy classes in simply-connected domains in the plane. *Ukrainian Math. J.* **42** (1990), no. 9, 1126–1130

[38] A. A. Dovgoshei, The F. and M. Riesz' theorem and Carathéodory domains. *Anal. Math.* **21** (1995), no. 3, 165–175

[39] O. Dovgoshey, Certain characterizations of Carathéodory domains. *Comput. Methods Funct. Theory* **5** (2005), no. 2, 489–503

[40] P. Duren, B. W. Romberg, and A. Shields, Linear functionals on H^p spaces with $0 < p < 1$. *J. Reine Angew. Math.* **238** (1969), 32–60

[41] P. Duren and A. Schuster, *Bergman spaces*. Math. Surveys Monogr. 100, American Mathematical Society, Providence, RI, 2004

[42] P. L. Duren, *Theory of* H^p *spaces*. Pure Appl. Math. 38, Academic Press, New York-London, 1970

[43] L. C. Evans and R. F. Gariepy, *Measure theory and fine properties of functions*. Stud. Adv. Math., CRC Press, Boca Raton, FL, 1992

[44] O. J. Farrell, On approximation to a mapping function by polynomials. *Amer. J. Math.* **54** (1932), no. 3, 571–578

[45] O. J. Farrell, On approximation to an analytic function by polynomials. *Bull. Amer. Math. Soc.* **40** (1934), no. 12, 908–914

[46] O. J. Farrell, On approximation by polynomials to a function analytic in a simply connected region. *Bull. Amer. Math. Soc.* **41** (1935), no. 10, 707–711

[47] O. J. Farrell, On the representation of bounded analytic functions by sequences of polynomials. *Amer. J. Math.* **60** (1938), no. 3, 573–576

[48] O. J. Farrell, On approximation measured by a surface integral. *SIAM J. Numer. Anal.* **3** (1966), 236–247

[49] K. Y. Fedorovskiy, Uniform n-analytic polynomial approximation of functions on rectifiable contours in $\mathbb{C}$. *Math. Notes* **59** (1996), no. 4, 435–439

[50] K. Y. Fedorovskiy, On some properties and examples of Nevanlinna domains. *Proc. Steklov Inst. Math.* **253** (2006), 186–194

[51] K. Y. Fedorovskiy, Carathéodory domains and Rudin's converse of the maximum modulus principle. *Sb. Math.* **206** (2015), no. 1, 161–174

[52] K. Y. Fedorovskiy, Carathéodory sets and analytic balayage of measures. *Sb. Math.* **209** (2018), no. 9, 1376–1389

[53] K. Y. Fedorovskiy and P. Paramonov, On Lip^m-reflection of harmonic functions over boundaries of simple Carathéodory domains. *Anal. Math. Phys.* **9** (2019), no. 3, 1031–1042

[54] S. D. Fisher, *Function theory on planar domains*. Pure Math. Appl. (New York), John Wiley, New York, 1983

[55] D. Gaier, *Lectures on complex approximation*. Birkhäuser, Boston, MA, 1987

[56] T. W. Gamelin, *Uniform algebras*. Chelsea, New York, 1984

[57] S. Gardiner, *Harmonic approximation*. London Math. Soc. Lecture Note Ser. 221, Cambridge University Press, Cambridge, 1995

[58] J. Garnett, *Bounded analytic functions*. Pure Appl. Math. 96, Academic Press, Harcourt Brace Jovanovich, New York-London, 1981

[59] J. B. Garnett and D. E. Marshall, *Harmonic measure*. New Math. Monogr. 2, Cambridge University Press, Cambridge, 2005

[60] I. Glicksberg, The abstract F. and M. Riesz theorem. *J. Functional Analysis* **1** (1967), 109–122

[61] G. M. Goluzin, *Geometric theory of functions of a complex variable*. Transl. Math. Monogr. 26, American Mathematical Society, Providence, RI, 1969

[62] F. Hartogs and A. Rosenthal, Über Folgen analytischer Funktionen. *Math. Ann.* **104** (1931), no. 1, 606–610

[63] V. P. Havin, Approximation in the mean by analytic functions. *Dokl. Akad. Nauk SSSR* **178** (1968), 1025–1028

[64] L. I. Hedberg, Weighted mean approximation in Carathéodory regions. *Math. Scand.* **23** (1968), 113–122

[65] L. I. Hedberg and T. H. Wolff, Thin sets in nonlinear potential theory. *Ann. Inst. Fourier (Grenoble)* **33** (1983), no. 4, 161–187

[66] H. Hedenmalm, B. Korenblum, and K. Zhu, *Theory of Bergman spaces*. Grad. Texts in Math. 199, Springer, New York, 2000

[67] L. L. Helms, *Introduction to potential theory*. Pure Appl. Math. XXII, Wiley-Interscience A division of John Wiley, New York-London-Sydney, 1969

[68] J. G. Hocking and G. S. Young, *Topology*. Addison-Wesley, Reading, Mass.-London, 1961

[69] K. Hoffman, *Banach spaces of analytic functions*. Dover, New York, 1988

[70] G. P. Kapoor and A. Nautiyal, Approximation of entire functions over Carathéodory domains. *Bull. Austral. Math. Soc.* **25** (1982), no. 2, 221–229

[71] M. V. Keldych, Sur l'approximation en moyenne quadratique des fonctions analytiques. *Rec. Math. [Mat. Sbornik] N.S.* **5** (1939), no. 47, 391–401

[72] M. V. Keldych, Sur la represénotations par des séries de polynomes des functions d'una variable complex dans de domains fermés. *Rec. Math. [Mat. Sbornik] N.S.* **8** (1940), no. 50, 137–148

[73] M. V. Keldych, Sur l'approximation en moyenne par polynomes des fonctions d'une variable complexe. *Rec. Math. [Mat. Sbornik] N.S.* **16** (1945), no. 58, 1–20

[74] D. Khavinson, F. and M. Riesz theorem, analytic balayage, and problems in rational approximation. *Constr. Approx.* **4** (1988), no. 4, 341–356

[75] S. Ya. Khavinson, On some extremal problems of the theory of analytic functions. *Moskov. Gos. Univ. Učenye Zapiski Matematika* **148** (1951), no. 4, 133–143. English translation: Amer. Math. Soc. Transl. (2) **32** (1963), 139–154

[76] J. Kim and W. Y. Lee, Invariant subspaces for operators whose spectra are Carathéodory regions. *J. Math. Anal. Appl.* **371** (2010), no. 1, 184–189

[77] P. Koosis, *Introduction to H_p spaces*. 2nd edn., Cambridge Tracts in Math. 115, Cambridge University Press, Cambridge, 1998

[78] K. Kuratowski, *Topology. Vol. II*. Academic Press, New York-London, 1968

[79] M. A. Lavrentiev, *Sur les fonctions d'une variable complex représentables par des séries de polynômes*. Hermann, Paris, 1936

[80] H. Lebesgue, Sur le problème de Dirichlet. *Rend. Circ. Mat. di Palermo* **29** (1907), no. 1, 371–402

[81] D. H. Luecking and L. A. Rubel, *Complex analysis*. Universitext, Springer, New York, 1984

[82] F.-Y. Maeda and N. Suzuki, The integrability of superharmonic functions on Lipschitz domains. *Bull. London Math. Soc.* **21** (1989), no. 3, 270–278

[83] A. I. Markouchevitch, Sur la représentation conforme des domaines à frontières variables. *Rec. Math. [Mat. Sbornik] N.S.* **1(43)** (1936), no. 6, 863–886

[84] A. I. Markushevich, *Conformal mapping of regions with variable boundary and application to the approximation of analytic functions by polynomials*. Ph.D. thesis, Moscow, 1934

[85] A. I. Markushevich, Theory of analytic functions. Vols. 1 and 2. *Prentice-Hall, Englewood Cliffs, NJ* (1965)

[86] M. Y. Mazalov, Example of a nonrectifiable Nevanlinna contour. *St. Petersburg Math. J.* **27** (2016), no. 4, 625–630

[87] M. Y. Mazalov, On Nevanlinna domains with fractal boundaries. *St. Petersburg Math. J.* **29** (2018), no. 5, 777–791

[88] M. Y. Mazalov, P. V. Paramonov, and K. Y. Fedorovskiy, Conditions for the C^m-approximability of functions by solutions of elliptic equations. *Russ. Math. Surveys* **67** (2012), no. 6, 1023–1068

[89] S. Mazurkiewicz, Uber erreichbare Punkte. *Fund. Math.* **26** (1936), 150–155

[90] S. N. Mergelyan, Uniform approximations of functions of a complex variable. *Uspehi Matem. Nauk (N.S.)* **7** (1952), no. 2, 31–122. English translation: Amer. Math. Soc. Transl. (2) **101** (1954)

[91] S. N. Mergelyan, On completeness of systems of analytic functions. *Uspehi Matem. Nauk (N.S.)* **8** (1953), no. 4, 3–63. English translation: Amer. Math. Soc. Transl. (2) **19** (1962), 109–166

[92] K. Miller, Extremal barriers on cones with Phragmén–Lindelöf theorems and other applications. *Ann. Mat. Pura Appl. (4)* **90** (1971), 297–329

[93] Z. Nehari, *Conformal mapping*. Dover, New York, 1975

[94] M. H. Newman, *Elements of the topology of plane sets of points*. Cambridge University Press, New York, 1964

[95] A. G. O'Farrell, A generalised Walsh–Lebesgue theorem. *Proc. Roy. Soc. Edinburgh Sect. A* **73** (1975), 231–234

[96] A. G. O'Farrell, Theorems of Walsh–Lebesgue type. In *Aspects of contemporary complex analysis (Proc. NATO Adv. Study Inst., Univ. Durham, Durham, 1979)*, edited by D. A. Brannan and J. G. Clunie, pp. 461–467, Academic Press, London-New York, 1980

[97] A. G. O'Farrell, Five generalisations of the Weierstrass approximation theorem. *Proc. Roy. Irish Acad. Sect. A* **81** (1981), no. 1, 65–69

[98] A. G. O'Farrell and F. Pérez-González, Pointwise bounded approximation by polynomials. *Math. Proc. Cambridge Philos. Soc.* **112** (1992), no. 1, 147–155

[99] P. V. Paramonov, C^m-approximations by harmonic polynomials on compact sets in $\mathbb{R}^n$. *Russian Acad. Sci. Sb. Math.* **78** (1994), no. 1, 231–251

[100] P. V. Paramonov, C^1-extension and C^1-reflection of subharmonic functions from Lyapunov–Dini domains into $\mathbb{R}^N$. *Sb. Math.* **199** (2008), no. 12, 1809–1846

[101] P. V. Paramonov, On Lip^m and C^m-reflection of harmonic functions with respect to boundaries of Carathéodory domains in $\mathbb{R}^2$. *Vestn. Mosk. Gos. Tekh. Univ. im. N.E. Baumana, Estestv. Nauki [Herald of the Bauman Moscow State Tech. Univ., Nat. Sci.]* (2018), no. 4, 36–45

[102] P. V. Paramonov and K. Y. Fedorovskiy, On C^m-reflection of harmonic functions and C^m-approximation by harmonic polynomials. *Sb. Math.* **211** (2020), no. 8, 1159–1170

[103] C. Pommerenke, *Univalent functions*. Studia Math./Mathematische Lehrbücher XXV, Vandenhoeck & Ruprecht, Göttingen, 1973

[104] C. Pommerenke, *Boundary behaviour of conformal maps*. Grundlehren Math. Wiss. 299, Springer, Berlin, 1992

[105] I. I. Privalov, *Boundary properties of analytic functions*. 2nd edn., GITTL, Moscow, 1950. German translation: *Randeigenschaften analytischer Funktionen*, Hochschulbücher für Mathematik, Bd. 25. VEB Deutscher Verlag der Wissenschaften, Berlin, 1956

[106] J. Z. Qiu, Density of polynomials. *Houston J. Math.* **21** (1995), no. 1, 109–118

[107] T. Ransford, *Potential theory in the complex plane*. London Math. Soc. Stud. Texts 28, Cambridge University Press, Cambridge, 1995

[108] R. C. Roan, Weak* generators of H^∞ and l^1. *Pacific J. Math.* **71** (1977), no. 2, 537–544

[109] R. C. Roan, Composition operators on H^p with dense range. *Indiana Univ. Math. J.* **27** (1978), no. 1, 159–162

[110] A. Roth, Approximationseigenschaften und Strahlengrenzwerte meromorpher und ganzer Funktionen. *Comment. Math. Helv.* **11** (1938), no. 1, 77–125

[111] L. A. Rubel and A. L. Shields, Bounded approximation by polynomials. *Bull. Amer. Math. Soc.* **69** (1963), 591–593

[112] L. A. Rubel and A. L. Shields, Bounded approximation by polynomials. *Acta Math.* **112** (1964), 145–162

[113] W. Rudin, Analyticity, and the maximum modulus principle. *Duke Math. J.* **20** (1953), no. 3, 449–457

[114] W. Rudin, *Functional analysis*. Tata McGraw-Hill, New Delhi, 1977

[115] W. Rudin, *Real and complex analysis*. 3rd edn., McGraw-Hill, New York, 1987

[116] C. Runge, Zur Theorie der Eindeutigen Analytischen Functionen. *Acta Math.* **6** (1885), no. 1, 229–244

[117] A. L. Šaginyan, On approximation in the mean by harmonic polynomials. *Akad. Nauk Armyan. SSR Dokl.* **19** (1954), 97–103

[118] S. Saks and A. Zygmund, *Fonctions analytiques*. Masson et Cie, Éditeurs, Paris, 1970

[119] D. Sarason, Invariant subspaces and unstarred operator algebras. *Pacific J. Math.* **17** (1966), 511–517

[120] D. Sarason, Weak-star generators of H^∞. *Pacific J. Math.* **17** (1966), 519–528

[121] D. Sarason, On the order of a simply connected domain. *Michigan Math. J.* **15** (1968), 129–133

[122] A. Shields, Carathéodory and conformal mapping. *Math. Intelligencer* **10** (1988), no. 1, 18–22

[123] S. O. Sinanjan, Approximation by analytical functions and polynomials in the mean with respect to the area. *Mat. Sb. (N.S.)* **69** (1966), 546–578. English translation: Amer. Math. Soc. Transl. (2) **74** (1968), 91–124

[124] V. I. Smirnov and N. A. Lebedev, *Functions of a complex variable: Constructive theory*. The MIT Press, Cambridge, MA, 1968

[125] E. L. Stout, *The theory of uniform algebras*. Bogden & Quigley, Tarrytown-on-Hudson, NY, 1971

[126] A. Stray, Pointwise bounded approximation by functions satisfying a side condition. *Pacific J. Math.* **51** (1974), 301–305

[127] P. K. Suetin, Polynomials orthogonal over a region and Bieberbach polynomials. *Proc. Steklov Inst. Math.* **100** (1974), 1–91

[128] A. G. Vitushkin, The analytic capacity of sets in problems of approximation theory. *Russian Math. Surveys* **22** (1967), no. 6, 139–200

[129] J. L. Walsh, Über die Entwicklung einer analytischen Funktion nach Polynomen. *Math. Ann.* **96** (1927), no. 1, 430–436

[130] J. L. Walsh, Über die Entwicklung einer Funktion einer komplexen Veränderlichen nach Polynomen. *Math. Ann.* **96** (1927), no. 1, 437–450

[131] J. L. Walsh, On approximation to an arbitrary function of a complex variable by polynomials. *Trans. Amer. Math. Soc.* **30** (1928), no. 3, 472–482

[132] J. L. Walsh, Über die Entwicklung einer harmonischen Funktion nach harmonischen Polynomen. *J. Reine Angew. Math.* **159** (1928), 197–209

[133] J. L. Walsh, The approximation of harmonic functions by harmonic polynomials and by harmonic rational functions. *Bull. Amer. Math. Soc.* **35** (1929), no. 4, 499–544

[134] J. L. Walsh, *Interpolation and approximation by rational functions in the complex domain*. Amer. Math. Soc. Colloq. Publ. XX, American Mathematical Society, Providence, RI, 1969

[135] J. Wermer, On algebras of continuous functions. *Proc. Amer. Math. Soc.* **4** (1953), 866–869

[136] G. T. Whyburn, *Analytic topology*. Amer. Math. Soc. Colloq. Publ. 28, American Mathematical Society, New York, 1971

[137] T. Winiarski, Approximation and interpolation of entire functions. *Ann. Polon. Math.* **23** (1970), 259–273