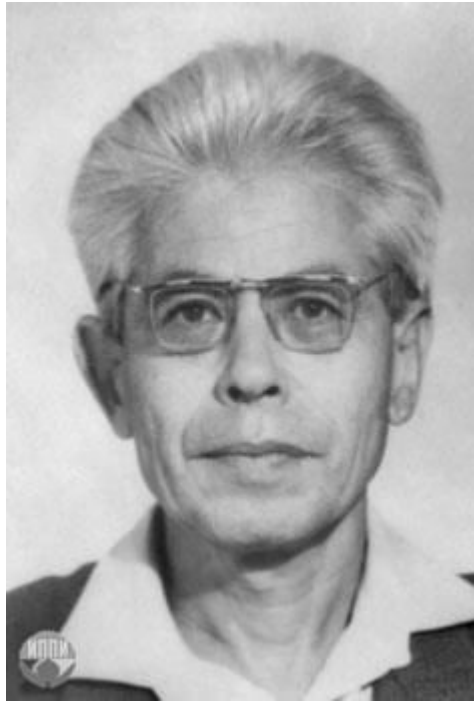


# Арлен Михайлович Ильин



**(08.01.1932 - 23.06.2013)**

**Арлен Михайлович Ильин** родился 8 января 1932 года в Ленинграде. В 1954 году окончил механико-математический факультет МГУ по специальности «Математика». В 1957 г. защитил кандидатскую диссертацию и с 1957 г. по 1963 г. работал преподавателем в МГУ.

С 1963 г. А. М. Ильин работал на Урале, где им создана научная школа. Под его руководством 12 учеников защитили кандидатские диссертации, четверо из них являются докторами физ.-матем. наук.

В 1988 г. А. М. Ильин защитил докторскую диссертацию. С 1988 г. он работал профессором кафедры ВМ и УМФ Уральского политехнического института, являясь одновременно ведущим научным сотрудником Института математики и механики УрО РАН (с 1990 года).

В марте 1994 г. А. М. Ильин был избран членом-корреспондентом Российской академии наук и с апреля этого года по февраль 2002 г. руководил отделом уравнений математической физики ИММ УрО РАН.

В 1995 г. А. М. Ильину была присуждена премия имени И. Г. Петровского Российской академии наук за цикл работ "Асимптотические методы в математической физике" (совместно с О. А. Олейник).

В мае 2000 года был избран действительным членом Российской академии наук.

2000 г. ему также была присуждена Государственная премия (в коллективе с В. С. Буслаевым и М. В. Карасевым) за цикл работ "Асимптотические методы исследования уравнений математической физики".

В 2000-2002 Ильин сотрудничал с Бурятским государственным университетом.

В 2001-2002 –директор Института математики и информатики БГУ.

С сентября 2002 года – профессор кафедры вычислительной математики Челябинского государственного университета.

В последние годы А. М. Ильин много работал в экспертных советах. ВАК И РФФИ.

Главная тематика работ А. М. Ильина и работ его учеников — асимптотика решений краевых задач для дифференциальных уравнений с частными производными. Им разработан метод согласования асимптотических разложений решений сингулярно возмущенных задач, проведено строгое математическое обоснование асимптотики для многих задач. Кроме широкого класса задач для уравнений с малым параметром при старших производных изучены, например, такие задачи, как обтекание тонкого тела плоским потоком идеальной жидкости и влияние малой диссипации на структуру ударной волны. Построены и обоснованы равномерные асимптотические разложения с точностью до любой степени малого параметра. Систематическое описание метода впервые в строго математическом изложении содержится в монографии А. М. Ильина, переведенной и изданной в США.

А.М. Ильина всегда отличали доброжелательность, принципиальность, мудрость, остроумие и обостренное чувство долга.

### **Список основных публикаций:**

1. **Il'in, AM**; Khachai, OY.

**Structure of boundary layers in singular problems**

DOKLADY MATHEMATICS 86(1), 497-499 (2012)

2. **Il'in, AM**; Rep'evskii, SV.

**On the solvability of a boundary-value problem for an elliptic equation**

MATHEMATICAL NOTES 92(1-2), 197-204 (2012)

3. Krasovskii, NN; Eremin, II; **Il'in, AM**; Kryazhimskii, AV; Kurzhan'ski, AB; Berdyshev, VI; Vasin, VV; Makhnev, AA; Matveev, SV; Subbotin, YN; Chentsov, AG; Ushakov, VN; Kabanov, VV; Maksimov, VI.

**On the 75th Birthday of Academician of the Russian Academy of Sciences Yurii Sergeevich Osipov**

PROCEEDINGS OF THE STEKLOV INSTITUTE OF MATHEMATICS 276, S1-S3 (2012)

4. Degtyarev, DO; **Il'in, AM**.

**The asymptotics of a solution of a parabolic equation as time increases without bound**

SBORNIK MATHEMATICS 203(11), 1589-1610 (2012)

5. **Il'in, A.M.**; Khachai, A.Yu..

**The Structure of Boundary Layers in Singular Problems**

Dokl. Akad. Nauk 445(3), 256 (2012)

6. **Il'in, AM**; Lelikova, EF.

**ON ASYMPTOTIC APPROXIMATIONS OF SOLUTIONS OF AN EQUATION WITH A SMALL PARAMETER**

ST PETERSBURG MATHEMATICAL JOURNAL 22(6), 927-939 (2011)

7. **Il'in, A. M.**; Markov, B. A..

**Nonlinear diffusion equation and Liesegang rings**

Dokl. Akad. Nauk 440, 164 (2011)

8. **Il'in, AM**; Ershov, AA.

**Asymptotics of two-dimensional integrals depending singularly on a small parameter**

PROCEEDINGS OF THE STEKLOV INSTITUTE OF MATHEMATICS 268, 131-142 (2010)

9. **Il'in, AM**; Leonychev, YA; Khachay, OY.

**The asymptotic behaviour of the solution to a system of differential equations with a small parameter and singular initial point**

SBORNIK MATHEMATICS 201(1-2), 79-101 (2010)

10. Gadyl'shin, RR; **Il'in, AM**.

**On the spectrum of the Neumann problem for Laplace equation in a domain with a narrow slit**

ASYMPTOTIC ANALYSIS 67(3-4), 167-189 (2010)

11. **Il'in, AM**; Suleimanov, BI.

**Asymptotic behaviour of a special solution of Abel's equation relating to a cusp catastrophe. II. Large values of the parameter  $t$**

SBORNIK MATHEMATICS 198(9-10), 1299-1324 (2007)

12. Dolbeeva, SF; **Il'in, AM**.

**Asymptotic behavior of the solution to a differential equation with a small parameter when the stability lines of the limit solution intersect**

DOKLADY MATHEMATICS 73(3), 388-390 (2006)

13. **Il'in, AM**; Suleimanov, BI.

**Asymptotic behaviour of a special solution of Abel's equation relating to a cusp catastrophe**

SBORNIK MATHEMATICS 197(1-2), 53-67 (2006)

14. Il'in, A. M.; Danilin, A. R.; Zakharov, S. V..

**Application of the concordance method of asymptotic expansion to solve boundary-value problems**

J. Math. Sci 125, 610 (2005)

15. **Il'in, AM**; Suleimanov, BI.

**Birth of step-like contrast structures connected with a cusp catastrophe**

SBORNIK MATHEMATICS 195(11-12), 1727-1746 (2004)

16. Danilin, A. R.; Zakharov, S. V.; **Il'in, A. M.**

**Application of the method of matching asymptotic expansions to the solution of boundary value problems**

Asimptot. Metody Funkts. Anal. 5, 33 (2003)

17. **Il'in, AM**; Suleimanov, BI.

**On two special functions related to fold singularities**

DOKLADY MATHEMATICS 66(3), 327-329 (2002)

18. Ilyin, A.M.; Kalashnikov, A.S.; Oleynik, O.A..

**Linear second-order partial differential equations of the parabolic type**

Russ. Math. Surv. 108(4), 435 (2002)

19. **Il'in, A**; Khasminskii, RZ; Yin, G.

**Asymptotic properties of solutions of parabolic equations arising from transient**

## **diffusions**

Acta Math. Appl. Sinica 18, 353 (2002)

20. **Il'in, A. M.**; Kalashnikov, A. S.; Oleinik, O. A..

### **Second-order linear equations of parabolic type**

J. Math. Sci. 108, 435 (2002)

21. Zakharov, SV; **Il'in, AM.**

### **From weak discontinuity to gradient catastrophe**

SBORNIK MATHEMATICS 192(9-10), 1417-1433 (2001)

22. **Il'in, AM**; Gadyl'shin, RR.

### **On the limits of applicability of the regular perturbation theory to a membrane with a narrow aperture**

DOKLADY MATHEMATICS 64(2), 270-273 (2001)

23. **Il'in, AM**; Gadyl'shin, RR.

### **On the limits of applicability of regular perturbation theory for a membrane with a narrow crack (in Russian)**

Dokl Akad Nauk 380, 172 (2001)

24. **Il'in, AM**; Khasminskii, RZ; Yin, G.

### **Asymptotic expansions of solutions of integro-differential equations for transition densities of singularly perturbed switching diffusions: Rapid switchings**

JOURNAL OF MATHEMATICAL ANALYSIS AND APPLICATIONS 238(2), 516-539 (1999)

25. **Il'in, AM**; Khasminskii, RZ; Yin, G.

### **Singularly perturbed switching diffusions: Rapid switchings and fast diffusions**

JOURNAL OF OPTIMIZATION THEORY AND APPLICATIONS 102(3), 555-591 (1999)

26. **Il'in, AM.**

### **On the two-scale method for the problem of perturbed one-frequency oscillations**

THEORETICAL AND MATHEMATICAL PHYSICS 118(3), 301-306 (1999)

27. **Il'in, AM**; Zyryanova, TY.

### **Asymptotics of the solution of an elliptic equation, degenerate on the boundary, with a small parameter at the higher derivatives. The case of weak degeneration**

DIFFERENTIAL EQUATIONS 34(8), 1096-1103 (1998)

28. Gadyl'shin, RR; **Il'in, AM.**

### **Asymptotic behaviour of the eigenvalues of the Dirichlet problem in a domain with a narrow slit**

SBORNIK MATHEMATICS 189(3-4), 503-526 (1998)

29. Danilin, A. R; **Il'in, A. M.**

### **On the structure of the solution of a perturbed time-optimality problem**

Fundam. Prikl. Mat. 4(3), 905 (1998)

30. **Il'in, A.M.**; Fedoryuk, M.V..

### **The exponential boundary layer**

Partial Differential Equations V: Asymptotic Methods for Partial Differential Equations , (1998)

31. **Il'in, AM**; Yalysheva, TY.

**Elliptic equation with small parameter at higher derivatives that degenerates on the boundary of the domain**

DIFFERENTIAL EQUATIONS 33(6), 852-853 (1997)

32. **Ilin, AM**; Neudachin, DI.

**On the influence of a small dissipation on the weakly discontinuous solutions of a hyperbolic system**

DOKLADY AKADEMII NAUK 351(5), 583-585 (1996)

33. Danilin, AR; Ilin, AM.

**Asymptotic behavior of the solution of the optimal-time control problem under perturbed initial data**

DOKLADY AKADEMII NAUK 350(2), 155-157 (1996)

34. **Ilyin, A.**

**Averaging for dissipative dynamical systems with rapidly oscillating right-hand sides**

Mat. Sbornik 187, 15 (1996)

35. DANILIN, AR; ILIN, AM.

**THE ASYMPTOTICS OF THE SOLUTION OF A TIME-OPTIMAL PROBLEM WITH PERTURBED INITIAL CONDITIONS**

JOURNAL OF COMPUTER AND SYSTEMS SCIENCES INTERNATIONAL 33(6), 67-74 (1995)

36. **Ilin, A.M.**; Kalyakin, L.A..

**Perturbation of finite-soliton solutions to the Korteweg-de Vries equation**

Physics-Doklady 40(12), (1995)

36. **ILIN, AM**; KALYAKIN, LA.

**PERTURBATION OF N-SOLITON SOLUTION OF THE KORTEWEG-DEVRIES EQUATION**

DOKLADY AKADEMII NAUK 336(5), 595-598 (1994)

37. **Ilin, A.M.**

**On the asymptotic behaviour of the solution for a boundary value problems with a small parameter**

Math. USSR Izv 34(2), 261 (1990)

38. **ILIN, AM.**

**ON THE ASYMPTOTICS OF THE SOLUTION OF A PROBLEM WITH A SMALL PARAMETER**

MATHEMATICS OF THE USSR-IZVESTIYA 53(2), 261-279 (1989)

39. **Ilin, A.M.**

**On the asymptotic behavior of the solution for a boundary value problem with a small parameter**

Izv. Akad. Nauk Azerb. SSR Ser. Fiz.-Tekh. 53(2), 258 (1989)

40. **Il'in, A. M.**

**Boundary layer**

Results in Science and Technology 34, 175 (1988)

41. **Ilin, A. M.**

**Investigation of the asymptotic behavior of the solution of an elliptic boundaryvalue problem in a domain with a small hole**

J. Soviet Math. 33, 994 (1986)

42. **ILIN, AM.**

**INVESTIGATION OF SINGULARLY PERTURBED BOUNDARY-VALUE-PROBLEMS BY THE ASYMPTOTIC-EXPANSION-CONSISTENCY METHOD**  
DIFFERENTIAL EQUATIONS 21(10), 1192-1196 (1985)

43. **ILIN, AM.**

**A SUFFICIENT CONDITION FOR STABILIZATION OF SOLUTION OF THE PARABOLIC EQUATION**  
MATHEMATICAL NOTES 37(5-6), 466-469 (1985)

44. **ILIIN, AM.**

**THE CAUCHY-PROBLEM FOR A QUASI-LINEAR PARABOLIC EQUATION WITH A SMALL PARAMETER**  
DOKLADY AKADEMII NAUK SSSR 283(3), 530-534 (1985)

45. **ILIN, AM;** LELIKOVA, EF.

**ASYMPTOTICS OF THE SOLUTIONS OF SOME HIGHER-ORDER ELLIPTIC-EQUATIONS IN CONICAL DOMAINS**  
MATHEMATICS OF THE USSR-SBORNIK 125(1-2), 89-117 (1984)

46. **ILIN, AM;** SULEIMANOV, BI.

**THE ASYMPTOTICS OF THE GREEN-FUNCTION FOR A 2ND-ORDER ELLIPTIC EQUATION NEAR THE BOUNDARY OF THE DOMAIN**  
MATHEMATICS OF THE USSR-IZVESTIYA 47(6), 579-594 (1983)

47. **ILIN, AM.**

**ASYMPTOTICS OF THE SOLUTION OF A BOUNDARY-VALUE PROBLEM FOR POISSONS-EQUATION IN THE EXTERIOR OF A CYLINDER AND A HALF-CYLINDER**  
MATHEMATICS OF THE USSR-SBORNIK 118(2), 183-202 (1982)

48. **ILIN, AM;** LELIKOVA, EF.

**ASYMPTOTICS OF SOLUTIONS OF SOME ELLIPTIC-EQUATIONS IN UNBOUNDED-DOMAINS**  
MATHEMATICS OF THE USSR-SBORNIK 119(3-4), 295-313 (1982)

49. **Il'in, A. M..**

**Analysis of asymptotics of the solution of an elliptic boundary value problem in a domain with a small aperture**  
Tr. Semin. im. I.G. Petrovskogo (6), 77 (1982)

50. **Il'in, A.M..**

**Study of the asymptotic behavior of the solution of an elliptic boundary value problem in a domain with a small hole**  
Tr. Semin. Im. I.G. Petrovskogo (6), 57 (1981)

51. **ILIN, AM;** NESTEROVA, TN.

**ASYMPTOTICS OF CAUCHY-PROBLEM SOLUTION FOR ONE QUASILINEAR PARABOLIC EQUATION WITH SMALL PARAMETER**  
DOKLADY AKADEMII NAUK SSSR 240(1), 11 (1978)

52. **Il'in, A.M..**

**A boundary value problem for a second-order elliptic equation in a domain with a narrow slit. I: The two-dimensional case**

Math. USSR Sb 28, 459 (1978)

53. **ILIN, AM.**

**BOUNDARY-VALUE PROBLEM FOR THE 2ND ORDER ELLIPTIC EQUATION IN A DOMAIN WITH A NARROW SLIT .2. DOMAIN WITH A SMALL CAVITY**  
MATHEMATICS OF THE USSR-SBORNİK 32(2), 227 (1977)

54. Zashkvara, V.V.; **Il'in, A.M.**; Kryuchkov, V.F..

**Focusing of an axisymmetric charged-particle beam in a hyperbolic electrostatic field**

Soviet Physics - Technical Physics 22(7), (1977)

55. **Il'in, A. M..**

**A boundary-value problem for a second-order elliptic equation in a domain with a narrow slit. II. Domain with a small opening**

Mat. Sb. 103(145), 265 (1977)

56. **Il'in, A. M..**

**A boundary value problem with a small parameter**

Uspekhi Mat. Nauk 32(3), 161 (1977)

57. **ILIN, AM**; GORKOV, YP; LELIKOVA, EF.

**METHOD OF ASYMPTOTIC EXPANSION JOINING**

DOKLADY AKADEMII NAUK SSSR 217(5), 1033 (1974)

58. **IL'IN, A. M..**

**On the behaviour of the solution of a boundary-value problem when  $t \rightarrow \infty$ ;**

Math. USSR, Sb. 16, 545 (1972)

59. **IL'IN, A. M..**

**Asymptotic properties of a solution of a boundary-value problem**

Math. Notes 8, 625 (1970)

60. **Il'in, A. M..**

**A difference scheme for a differential equation with a small parameter multiplying the highest derivative**

Mat. Zametki 6, 237 (1969)

61. **Il'in, A.M..**

**Differencing scheme for a differential equation with a small parameter affecting the highest derivative**

Math. Notes 6, 592 (1969)

62. **Il'in, A.M..**

**Parabolic equations whose coefficients do not satisfy the Dini condition**

Mat. Zametki 1, 71 (1967)

63. Emel'yanov, K.V; **Il'in, A.M..**

**On the number of arithmetical operations necessary for an approximate solution of Fredholm integral equation of the second kind**

Zhurnal Vychislitel'noi Matematiki i Matematicheskoi Fiziki 7(4), (1967)

64. Emel'yanov, K. V; **Il'in, A. M..**

**Number of arithmetic operations necessary for the approximate solution of Fredholm integral equations**

USSR Comput. Math. Phys 7(4), 259 (1967)

65. **Ilin, A. M.**; Khasminskii, R. Z..

**Asymptotic behavior of solutions of parabolic equations and an ergodic property of nonhomogeneous diffusion processes**

Amer. Math. Soc. Transl. 60(102), 241 (1965)

67. **ILIN, AM.**

**EIGEN-FUNCTIONS OF ELLIPTIC OPERATOR IN CERTAIN UNBOUNDED REGIONS**

DOKLADY AKADEMII NAUK SSSR 161(4), 757 (1965)

68. **Il'in, A. M.**; Khas'minskii, R. Z..

**On equations of brownian motion**

Theory of Probability and Its Applications 9(3), 421 (1964)

69. **ILIN, AM.**

**ON CLASS OF ULTRAPARABOLIC EQUATIONS**

DOKLADY AKADEMII NAUK SSSR 159(6), 1214 (1964)

70. **Il'in, A.M.**; Oleinik, O.A..

**Behavior of the solution of the Cauchy problem for certain quasi-linear equations for unbounded increase of time**

Amer. Math. Soc. Transl. 42, 19 (1964)

71. **ILIN, AM.**

**FUNDAMENTAL SOLUTION TO A PARABOLIC EQUATION**

DOKLADY AKADEMII NAUK SSSR 147(4), 768 (1962)

72. **Ilin, A.M.**; Kalashnikov, A.S.; Oleinik, O.A..

**Second order linear equations of parabolic type**

Russian Math. Surveys 17(3), 1 (1962)

73. **Il'in, A. M.**; Kalashnikov, A. S.; Oleynik, O. A..

**Linear second order equations of parabolic type**

Usp. Mat. Nauk 105, 3 (1962)

74. **Il'in, A. M.**

**On the behaviour of the solution of the Cauchy problem for a parabolic equation under unrestricted growth of time**

Uspekhi Mat. Nauk 16(2), 115 (1961)

75. **Il'in, A. M.**

**Degenerating elliptic and parabolic equations**

Mat. Sb. 50, 443 (1960)

76. **Iljin, A.M.**; Oleinik, O.A..

**Asymptotic long-time behavior of the Cauchy problem for some quasilinear equation**

Mat. Sb. 51, 191 (1960)

77. **Il'in, A. M.**; Oleinik, O. A..

**Asymptotic behavior of the solutions of the Cauchy problem for some quasi-linear equations for large values of the time**

Mat. Sb. 51, 191 (1960)

78. **Il'in, A. M.**

**Degenerating elliptic and parabolic equations, research reports of higher schools**

Phis. Math. 2, 48 (1958)



79. **Il'in, A. M.**

**On degenerating equations of elliptic and parabolic type**

Usp. Mat. Nauk 11, 176 (1956)