

FONDAZIONE C.I.M.E.
CENTRO INTERNAZIONALE MATEMATICO ESTIVO
INTERNATIONAL MATHEMATICAL SUMMER CENTER

“Probability and Analysis”

is the subject of the First 1985 C.I.M.E. Session.

The Session, sponsored by the Consiglio Nazionale delle Ricerche and the Ministero della Pubblica Istruzione, will take place under the scientific direction of Prof. GIORGIO LETTA and Prof. MAURIZIO PRATELLI (Università di Pisa, Italy) at «Villa Monastero», Varenna (Como), Italy, *from May 31 to June 8, 1985.*

Courses

- a) ***Some Applications of Probability to Geometry*** (6 lectures in English).
Prof. Jean-Michel BISMUT (Université Paris-Sud).
- Large deviations and the asymptotics of the heat kernel.
 - The index theorem of Atiyah-Singer for Dirac operators.
 - Some geometrical properties of the loop space of a Riemannian manifold.
 - The Witten complex and its applications.

References

- M.F. Atiyah: Classical groups and classical operators on manifolds. In «Differential operators on manifolds». CIME, Cremonese, Roma 1975.
- M.F. Atiyah, I.M. Singer: The index of elliptic operators III. Ann. of Math. 87 (1968), 546-604.
- J.M. Bismut: Large deviations and the Malliavin calculus. Progress in Math. n. 45, Birkhauser, 1984.
- B. Doubrovine, S. Novikov, A. Fomenko: Géométrie contemporaine I and II. Editions MIR (also English edition by Springer) (see the basics on connections in these two books).
- WITTEN E.: Supersymmetry and Morse theory. J. of Diff. Geom. 17 (1982), 661-692.

- b) ***Martingales and Fourier Analysis in Banach Spaces.*** (6 lectures in English).
Prof. Donald L. BURKHOLDER (University of Illinois, Urbana).
- Martingale transforms and the geometry of Banach spaces.
 - A geometrical condition implying the boundedness of singular integral operators.
 - Bourgain's converse.
 - Optimal control of martingales.
 - Boundary value problems and sharp inequalities for martingale transforms and stochastic integrals.
 - Some other problems and recent progress in probability, geometry, and Fourier Analysis.

References

- J. BOURGAIN, Some remarks on Banach spaces in which martingale difference sequences are unconditional. Ark. Mat. 21 (1983), 163-168.
- D.L. BURKHOLDER, A Geometrical characterization of Banach spaces in which martingale difference sequences are unconditional. Ann. Probab. 9 (1981): 997-1011.
- D.L. BURKHOLDER, A geometric condition that implies the existence of certain singular integrals of Banach-space-valued functions, in «Conference on Harmonic Analysis in Honor of Antoni Zygmund» (W. Beckner, A.P. Calderon, R.F. Fefferman, and P.W. Jones, editors), Wadsworth, Belmont, California, 1983.
- D.L. BURKHOLDER, Boundary value problems and sharp inequalities for martingale transforms. Ann. Probab. 12 (1984), 647-702.

- c) ***Martingale Theory: an Analytical Formulation with some Applications in Analysis.*** (6 lecture in English).
Prof. S. D. CHATTERJI (EPF Lausanne).
- A basic convergence theorem: its statement and discussion. Its relation to martingale, semimartingale et amart convergence theory.
 - Proof of the convergence theorem.
 - Applications:
 - (a) Lebesgue differentiation theorem
 - (b) Product measures
 - (c) Ryll-Nardzewski's fixed point theorem
 - (d) Miscellaneous.

References

- S.D. CHATTERJI, Les martingales et leurs applications analytiques. Lecture Notes in Mathematics, vol. 307, Springer Verlag, Berlin, 1973.

- d) ***Probabilistic Methods in the Geometry of Banach Spaces.*** (6 lectures in English).
Prof. Gilles PISIER (Université Paris VI).

Summary

The course will present the notions of type and cotype of a Banach space together with their geometric interpretations. The duality problem between type and cotype will be discussed and the main results related to the notion of k -convexity will be presented. Moreover, the relations of these notions with the famous theorem of Dvoretzky on the spherical sections of convex bodies will be discussed, using some recent inequalities concerning vector valued Gaussian random variables. The latter inequalities can be advantageously used instead of the isoperimetric inequality on the sphere.

References

- B. MAUREY, G. PISIER, Séries de variables aléatoires vectorielles indépendantes et propriétés géométriques des espaces de Banach. *Studia Math.* 58 (1976), 45-90.
- G. PISIER, Holomorphic semi-groups and the geometry of Banach spaces. *Annals of Math.* 115 (1982), 375-392.
- T. FIGIEL, J. LINDENSTRAUSS, V. MILMAN, The dimension of the spherical sections of convex bodies. *Acta Math.* 139 (1977), 53-94.
- Y. BENYAMINI, Y. GORDON, Random factorization of operators between Banach spaces. *Journal Analyse. Jerusalem.* 39 (1981), 45-74.

Seminars

A number of seminars and special lectures will be offered during the Session.

FONDAZIONE C.I.M.E.
CENTRO INTERNAZIONALE MATEMATICO ESTIVO
INTERNATIONAL MATHEMATICAL SUMMER CENTER

“Some Problems in Nonlinear Diffusion”

is the subject of the Second 1985 C.I.M.E. Session.

The Session, sponsored by the Consiglio Nazionale delle Ricerche and the Ministero della Pubblica Istruzione, will take place under the scientific direction of Prof. ANTONIO FASANO and Prof. MARIO PRIMICERIO (Università di Firenze, Italy) at Villa «La Querceta», Montecatini Terme (Pistoia), Italy, *from June 10 to June 18, 1985.*

Courses

- a) **The Porous Medium Equation.** (8 lectures in English).
Prof. D. G. ARONSON (University of Minnesota, USA).
- Physical background, elementary properties, basic existence and uniqueness theory.
 - Regularity in one space dimension.
 - Properties of the interface in one space dimension: smoothness, nonsmoothness, waiting time.
 - The relationship between the porous medium pressure equation and a Hamilton-Jacobi equation: limiting behavior as $m \rightarrow 1$.
 - Regularity in \mathbb{R}^d for $d > 1$: Hölder continuity and quasi convexity.
 - Initial trace, existence and uniqueness in \mathbb{R}^d : Harnack-type estimates and growth at infinity.
 - Asymptotic behavior of solutions of the initial-boundary value problem.
 - Stabilization results.

References

- D.G. ARONSON and P. BENILAN, Régularité des solutions de l'équation des milieux poreux dans \mathbb{R}^n . C.R. Acad. Sci. Paris, Série A-B, 288 (1979), 103-105.
- D.G. ARONSON and L.A. CAFFARELLI, The initial trace of a solution of the porous medium equation. Trans. Amer. Math. Soc. 280 (1983), 351-366.
- D.G. ARONSON, L.A. CAFFARELLI and J.L. VAZQUEZ, Interfaces with a corner point in one-dimensional porous medium flow. Comm. Pure Appl. Math., to appear.
- D.G. ARONSON, M.G. CRANDALL and L.A. PELETIER, Stabilization of solutions of a degenerate nonlinear diffusion problem. Nonlinear Analysis 6 (1982), 1002-1022.
- D.G. ARONSON, S. KAMIN and L.A. CAFFARELLI, How an initially stationary interface begins to move in porous medium flow. SIAM J. Math. Anal. 14 (1983), 639-658.
- D.G. ARONSON and L.A. PELETIER, Large time behaviour of solutions of the porous medium equation. J. Diff. Eq. 39 (1981), 378-412.
- P. BENILAN, M.G. CRANDALL and M. PIERRE, Solutions of the porous medium equation in \mathbb{R}^n under optimal conditions on initial values. Indiana Univ. Math. J. 33 (1984), 51-87.
- L.A. CAFFARELLI and A. FRIEDMAN, Continuity of the density of a gas flow in a porous medium. Trans. Amer. Math. Soc. 252 (1979), 99-113.
- L.A. CAFFARELLI and A. FRIEDMAN, Regularity of the free boundary of a gas flow in an n-dimensional porous medium. Indiana U. Math. J. 29 (1980), 361-391.
- B.E.J. DAHLBERG and C.E. KENIG, Nonnegative solutions of the porous medium equation. Comm. P.D.E., to appear.
- B.F. KNERR, The porous medium equation in one dimension. Trans. Amer. Math. Soc. 234 (1977), 381-415.
- O.A. OLEINIK, S.A. KALASHNIKOV and CHZOU YUI-LIN, The Cauchy problem and boundary problems for equations of the type of nonstationary filtration. Izv. Akad. Nauk SSSR Ser. Mat., 22 (1958), 667-704.

- b) ***Qualitative Methods in Reaction-Diffusion Equations.*** (8 lectures in English).

Prof. Joel SMOLLER (University of Michigan).

Outline.

Topological Methods, the Conley Index, Applications to Reaction-Diffusion Equations, the Fitz-Hugh Nagumo equations, Stability and Bifurcation of Stationary Solutions to Predator-Prey Equations, Symmetry-Breaking Solutions of Semilinear Elliptic equations.

References

- J. SMOLLER, Shock Waves and Reaction-Diffusion Equations. Springer Verlag, 1983.

- c) ***Reaction-Diffusion Problems in Chemistry.*** (8 lectures in English).

Prof. I. STAKGOLD (University of Delaware).

- The quasilinear parabolic system of equations for the concentration and temperature of a simple, irreversible reaction.
- The Frank-Kamenetskii, Semenov and Gelfand approximations, The notion of criticality.
- The method of upper and lower solutions.
- Existence, uniqueness and multiplicity of solutions.
- The case of nonlinearities that are not piecewise smooth. Extinction, dead cores and quenching.
- Free boundary problems and related estimates.
- Two-phase problems, particularly gas-solid interactions.
- The pseudo-steady-state approximation and estimates for the conversion.

Seminars

A number of seminars and special lectures will be offered during the Session.

FONDAZIONE C.I.M.E.
CENTRO INTERNAZIONALE MATEMATICO ESTIVO
INTERNATIONAL MATHEMATICAL SUMMER CENTER

“Theory of Moduli”

is the subject of the Third 1985 C.I.M.E. Session.

The Session, sponsored by the Consiglio Nazionale delle Ricerche and the Ministero della Pubblica Istruzione, will take place under the scientific direction of Prof. EDOARDO SERNESI (Università di Roma, Italy) at Villa «La Querceta», Montecatini Terme (Pistoia), Italy, *from June 21 to June 29, 1985.*

Courses

- a) ***Moduli of algebraic surfaces.*** (8 lectures in English).
Prof. Fabrizio CATANESE (Università di Pisa, Italy).
- Deformations of complex structures (theory of Kodaira-Spencer-Kuranishi).
 - Topological and complex analytic invariants of surfaces.
 - Outline of the Enriques-Kodaira classification of complex surfaces.
 - Existence of moduli spaces for algebraic varieties.
 - Surfaces of general type and their moduli spaces.
 - Moduli via periods.

References

- W. BARTH, C. PETERS, A. van de VEN, Compact complex surfaces. Springer Ergebnisse 4, (1984), Berlin-Heidelberg.
- A. BEAUVILLE, Surfaces algébriques complexes. Astérisque 54 (1978).
- E. BOMBIERI, Canonical models of surfaces of general type. Publ. Scient. I.H. E.S. 42 (1973), 447-495.
- F. CATANESE, On the moduli spaces of surfaces of general type. J. Diff. Geom. 19 (1984), 483-515.
- F. CATANESE, Commutative algebra methods and equations of regular surfaces, in «Algebraic Geometry», Proc. Bucharest 1982, Springer L.N.M. 1056 (1983), 68-111.
- D. GIESEKER, Global moduli for surfaces of general type. Inv. Math. 43 (1977), 233-282.
- K. KODAIRA, Collected papers, vol. II.
- K. KODAIRA, J. MORROW, Complex Manifolds, Holt Rinehart Winston (1971), New York.
- D. MUMFORD, Geometric invariant theory. (2nd edition 1982, with J. FOGARTHY as coauthor). Heidelberg, Springer, 1965.
- H. POPP, Moduli theory and classification theory of algebraic varieties. Springer L.N.M. 620 (1977).
- I. SHAFAREVITCH et al., Algebraic surfaces, Proc. Steklov Inst., A.M.S. Translation (1967), Providence.

- b) ***The Torelli and Schottky Problems.*** (8 lectures in English).
Prof. Ron DONAGI (Northeastern University, Boston).

Outline.

The theory of Prym varieties. Survey of works of Andreotti-Mayer, Beauville, R. Smith, Schottky-Young, van Geemen, Arbarello-De Concini and Shiota. Recent contributions to infinitesimal variations of Hodge structures.

- c) ***Cohomology of the Moduli Space of Curves.*** (8 lecture in English).
Prof. John HARER (University of Maryland).
- Cohomological dimension of the mapping class group.
 - Euler characteristic of the moduli space.
 - Stability theorem.
 - Survey of work of J. Harer, E. Miller, R. Lee, R. Charney, S. Wolpert.

LIST OF C.I.M.E. SEMINARS

	Publisher
1954 - 1. Analisi funzionale	C.I.M.E.
2. Quadratura delle superficie e questioni connesse	"
3. Equazioni differenziali non lineari	"
1955 - 4. Teorema di Riemann-Roch e questioni connesse	"
5. Teoria dei numeri	"
6. Topologia	"
7. Teorie non linearizzate in elasticità, idrodinamica, aerodinamica	"
8. Geometria proiettivo-differenziale	"
1956 - 9. Equazioni alle derivate parziali a caratteristiche reali	"
10. Propagazione delle onde elettromagnetiche	"
11. Teoria della funzioni di più variabili complesse e delle funzioni automorfe	"
1957 - 12. Geometria aritmetica e algebrica (2 vol.)	"
13. Integrali singolari e questioni connesse	"
14. Teoria della turbolenza (2 vol.)	"
1958 - 15. Vedute e problemi attuali in relatività generale	"
16. Problemi di geometria differenziale in grande	"
17. Il principio di minimo e le sue applicazioni alle equazioni funzionali	"
1959 - 18. Induzione e statistica	"
19. Teoria algebrica dei meccanismi automatici (2 vol.)	"
20. Gruppi, anelli di Lie e teoria della coomologia	"
1960 - 21. Sistemi dinamici e teoremi ergodici	"
22. Forme differenziali e loro integrali	"
1961 - 23. Geometria del calcolo delle variazioni (2 vol.)	"
24. Teoria delle distribuzioni	"
25. Onde superficiali	"
1962 - 26. Topologia differenziale	"
27. Autovalori e autosoluzioni	"
28. Magnetofluidodinamica	"
1963 - 29. Equazioni differenziali astratte	"
30. Funzioni e varietà complesse	"
31. Proprietà di media e teoremi di confronto in Fisica Matematica	"

1964 -	32. Relatività generale	C.I.M.E.
	33. Dinamica dei gas rarefatti	"
	34. Alcune questioni di analisi numerica	"
	35. Equazioni differenziali non lineari	"
1965 -	36. Non-linear continuum theories	"
	37. Some aspects of ring theory	"
	38. Mathematical optimization in economics	"
1966 -	39. Calculus of variations	Ed. Cremonese, Firenze
	40. Economia matematica	"
	41. Classi caratteristiche e questioni connesse	"
	42. Some aspects of diffusion theory	"
1967 -	43. Modern questions of celestial mechanics	"
	44. Numerical analysis of partial differential equations	"
	45. Geometry of homogeneous bounded domains	"
1968 -	46. Controllability and observability	"
	47. Pseudo-differential operators	"
	48. Aspects of mathematical logic	"
1969 -	49. Potential theory	"
	50. Non-linear continuum theories in mechanics and physics and their applications	"
	51. Questions of algebraic varieties	"
1970 -	52. Relativistic fluid dynamics	"
	53. Theory of group representations and Fourier analysis	"
	54. Functional equations and inequalities	"
	55. Problems in non-linear analysis	"
1971 -	56. Stereodynamics	"
	57. Constructive aspects of functional analysis (2 vol.)	"
	58. Categories and commutative algebra	"
1972 -	59. Non-linear mechanics	"
	60. Finite geometric structures and their applications	"
	61. Geometric measure theory and minimal surfaces	"
1973 -	62. Complex analysis	"
	63. New variational techniques in mathematical physics	"
	64. Spectral analysis	"

1974 - 65. Stability problems	Ed. Cremonese, Firenze
66. Singularities of analytic spaces	"
67. Eigenvalues of non linear problems	"
1975 - 68. Theoretical computer sciences	"
69. Model theory and applications	"
70. Differential operators and manifolds	"
1976 - 71. Statistical Mechanics	Ed. Liguori, Napoli
72. Hyperbolicity	"
73. Differential topology	"
1977 - 74. Materials with memory	"
75. Pseudodifferential operators with applications	"
76. Algebraic surfaces	"
1978 - 77. Stochastic differential equations	"
78. Dynamical systems	Ed. Liguori, Napoli and Birkhäuser Verlag
1979 - 79. Recursion theory and computational complexity	Ed. Liguori, Napoli
80. Mathematics of biology	"
1980 - 81. Wave propagation	"
82. Harmonic analysis and group representations	"
83. Matroid theory and its applications	"
1981 - 84. Kinetic Theories and the Boltzmann Equation	(LNM 1048)Springer-Verlag
85. Algebraic Threefolds	(LNM 947) "
86. Nonlinear Filtering and Stochastic Control	(LNM 972) "
1982 - 87. Invariant Theory	(LNM 996) "
88. Thermodynamics and Constitutive Equations	(LN Physics 228) "
89. Fluid Dynamics	(LNM 1047) "
1983 - 90. Complete Intersections	(LNM 1092) "
91. Bifurcation Theory and Applications	(LNM 1057) "
92. Numerical Methods in Fluid Dynamics	(LNM 1127) "
1984 93. Harmonic Mappings and Minimal Immersions	(LNM 1161) "
94. Schrödinger Operators	(LNM 1159) "
95. Buildings and the Geometry of Diagrams	to appear "
1985 - 96. Probability and Analysis	to appear "
97. Some Problems in Nonlinear Diffusion	to appear "
98. Theory of Moduli	to appear "

Note: Volumes 1 to 38 are out of print. A few copies of volumes 23,28,31,32,33,34,36,38 are available on request from C.I.M.E.

-
- Vol. 1008: Algebraic Geometry. Proceedings, 1981. Edited by J. Dolgachev. V, 138 pages. 1983.
- Vol. 1009: T.A. Chapman, Controlled Simple Homotopy Theory and Applications. III, 94 pages. 1983.
- Vol. 1010: J.-E. Dies, Chânes de Markov sur les permutations. IX, 226 pages. 1983.
- Vol. 1011: J.M. Sigal. Scattering Theory for Many-Body Quantum Mechanical Systems. IV, 132 pages. 1983.
- Vol. 1012: S. Kantorovitz, Spectral Theory of Banach Space Operators. V, 179 pages. 1983.
- Vol. 1013: Complex Analysis – Fifth Romanian-Finnish Seminar. Part 1. Proceedings, 1981. Edited by C. Andreian Cazacu, N. Boboc, M. Jurchescu and I. Suciu. XX, 393 pages. 1983.
- Vol. 1014: Complex Analysis – Fifth Romanian-Finnish Seminar. Part 2. Proceedings, 1981. Edited by C. Andreian Cazacu, N. Boboc, M. Jurchescu and I. Suciu. XX, 334 pages. 1983.
- Vol. 1015: Equations différentielles et systèmes de Pfaff dans le champ complexe – II. Seminar. Edited by R. Gérard et J.P. Ramis. V, 411 pages. 1983.
- Vol. 1016: Algebraic Geometry. Proceedings, 1982. Edited by M. Raynaud and T. Shioda. VIII, 528 pages. 1983.
- Vol. 1017: Equadiff 82. Proceedings, 1982. Edited by H.W. Knobloch and K. Schmitt. XXIII, 666 pages. 1983.
- Vol. 1018: Graph Theory, Łągów 1981. Proceedings, 1981. Edited by M. Borowiecki, J.W. Kennedy and M.M. Sysło. X, 289 pages. 1983.
- Vol. 1019: Cabal Seminar 79–81. Proceedings, 1979–81. Edited by A.S. Kechris, D.A. Martin and Y.N. Moschovakis. V, 284 pages. 1983.
- Vol. 1020: Non Commutative Harmonic Analysis and Lie Groups. Proceedings, 1982. Edited by J. Carmona and M. Vergne. V, 187 pages. 1983.
- Vol. 1021: Probability Theory and Mathematical Statistics. Proceedings, 1982. Edited by K. Itô and J.V. Prokhorov. VIII, 747 pages. 1983.
- Vol. 1022: G. Gentili, S. Salamon and J.-P. Vigué. Geometry Seminar "Luigi Bianchi", 1982. Edited by E. Vesentini. VI, 177 pages. 1983.
- Vol. 1023: S. McAdam, Asymptotic Prime Divisors. IX, 118 pages. 1983.
- Vol. 1024: Lie Group Representations I. Proceedings, 1982–1983. Edited by R. Herb, R. Lipsman and J. Rosenberg. IX, 369 pages. 1983.
- Vol. 1025: D. Tanré, Homotopie Rationnelle: Modèles de Chen, Quillen, Sullivan. X, 211 pages. 1983.
- Vol. 1026: W. Plesken, Group Rings of Finite Groups Over p -adic Integers. V, 151 pages. 1983.
- Vol. 1027: M. Hasumi, Hardy Classes on Infinitely Connected Riemann Surfaces. XII, 280 pages. 1983.
- Vol. 1028: Séminaire d'Analyse P. Lelong – P. Dolbeault – H. Skoda. Années 1981/1983. Édité par P. Lelong, P. Dolbeault et H. Skoda. VIII, 328 pages. 1983.
- Vol. 1029: Séminaire d'Algèbre Paul Dubreil et Marie-Paule Malliavin. Proceedings, 1982. Édité par M.-P. Malliavin. V, 339 pages. 1983.
- Vol. 1030: U. Christian, Selberg's Zeta-, L-, and Eisensteinseries. XII, 196 pages. 1983.
- Vol. 1031: Dynamics and Processes. Proceedings, 1981. Edited by Ph. Blanchard and L. Streit. IX, 213 pages. 1983.
- Vol. 1032: Ordinary Differential Equations and Operators. Proceedings, 1982. Edited by W.N. Everitt and R. T. Lewis. XV, 521 pages. 1983.
- Vol. 1033: Measure Theory and its Applications. Proceedings, 1982. Edited by J.M. Belley, J. Dubois and P. Morales. XV, 317 pages. 1983.
- Vol. 1034: J. Musielak, Orlicz Spaces and Modular Spaces. V, 222 pages. 1983.
- Vol. 1035: The Mathematics and Physics of Disordered Media. Proceedings, 1983. Edited by B.D. Hughes and B.W. Ninham. VII, 432 pages. 1983.
- Vol. 1036: Combinatorial Mathematics X. Proceedings, 1982. Edited by L.R.A. Casse. XI, 419 pages. 1983.
- Vol. 1037: Non-linear Partial Differential Operators and Quantization Procedures. Proceedings, 1981. Edited by S.I. Andersson and H.-D. Doebner. VII, 334 pages. 1983.
- Vol. 1038: F. Borceux, G. Van den Bossche, Algebra in a Localic Topos with Applications to Ring Theory. IX, 240 pages. 1983.
- Vol. 1039: Analytic Functions, Błażejewko 1982. Proceedings. Edited by J. Ławrynowicz. X, 494 pages. 1983.
- Vol. 1040: A. Good, Local Analysis of Selberg's Trace Formula. III, 128 pages. 1983.
- Vol. 1041: Lie Group Representations II. Proceedings 1982–1983. Edited by R. Herb, S. Kudla, R. Lipsman and J. Rosenberg. IX, 340 pages. 1984.
- Vol. 1042: A. Gut, K.D. Schmidt, Amarts and Set Function Processes. III, 258 pages. 1983.
- Vol. 1043: Linear and Complex Analysis Problem Book. Edited by V.P. Havin, S.V. Hruščëv and N.K. Nikol'skii. XVIII, 721 pages. 1984.
- Vol. 1044: E. Gekeler, Discretization Methods for Stable Initial Value Problems. VIII, 201 pages. 1984.
- Vol. 1045: Differential Geometry. Proceedings, 1982. Edited by A.M. Naveira. VIII, 194 pages. 1984.
- Vol. 1046: Algebraic K-Theory, Number Theory, Geometry and Analysis. Proceedings, 1982. Edited by A. Bak. IX, 464 pages. 1984.
- Vol. 1047: Fluid Dynamics. Seminar, 1982. Edited by H. Beirão da Veiga. VII, 193 pages. 1984.
- Vol. 1048: Kinetic Theories and the Boltzmann Equation. Seminar, 1981. Edited by C. Cercignani. VII, 248 pages. 1984.
- Vol. 1049: B. Iochum, Cônes autopolaires et algèbres de Jordan. VI, 247 pages. 1984.
- Vol. 1050: A. Prestel, P. Roquette, Formally p -adic Fields. V, 167 pages. 1984.
- Vol. 1051: Algebraic Topology, Aarhus 1982. Proceedings. Edited by I. Madsen and B. Oliver. X, 665 pages. 1984.
- Vol. 1052: Number Theory. Seminar, 1982. Edited by D.V. Chudnovsky, G.V. Chudnovsky, H. Cohn and M.B. Nathanson. V, 309 pages. 1984.
- Vol. 1053: P. Hilton, Nilpotente Gruppen und nilpotente Räume. V, 221 pages. 1984.
- Vol. 1054: V. Thomée, Galerkin Finite Element Methods for Parabolic Problems. VII, 237 pages. 1984.
- Vol. 1055: Quantum Probability and Applications to the Quantum Theory of Irreversible Processes. Proceedings, 1982. Edited by L. Accardi, A. Frigerio and V. Gorini. VI, 411 pages. 1984.
- Vol. 1056: Algebraic Geometry. Bucharest 1982. Proceedings, 1982. Edited by L. Bădescu and D. Popescu. VII, 380 pages. 1984.
- Vol. 1057: Bifurcation Theory and Applications. Seminar, 1983. Edited by L. Salvadori. VII, 233 pages. 1984.
- Vol. 1058: B. Aulbach, Continuous and Discrete Dynamics near Manifolds of Equilibria. IX, 142 pages. 1984.
- Vol. 1059: Séminaire de Probabilités XVIII, 1982/83. Proceedings. Édité par J. Azéma et M. Yor. IV, 518 pages. 1984.
- Vol. 1060: Topology. Proceedings, 1982. Edited by L.D. Faddeev and A.A. Mal'cev. VI, 389 pages. 1984.
- Vol. 1061: Séminaire de Théorie du Potentiel. Paris, No. 7. Proceedings. Directeurs: M. Brelot, G. Choquet et J. Deny. Rédacteurs: F. Hirsch et G. Mokobodzki. IV, 281 pages. 1984.
-

-
- Vol. 1062: J. Jost, Harmonic Maps Between Surfaces. X, 133 pages. 1984.
- Vol. 1063: Orienting Polymers. Proceedings, 1983. Edited by J.L. Ericksen. VII, 166 pages. 1984.
- Vol. 1064: Probability Measures on Groups VII. Proceedings, 1983. Edited by H. Heyer. X, 588 pages. 1984.
- Vol. 1065: A. Cuyt, Padé Approximants for Operators: Theory and Applications. IX, 138 pages. 1984.
- Vol. 1066: Numerical Analysis. Proceedings, 1983. Edited by D.F. Griffiths. XI, 275 pages. 1984.
- Vol. 1067: Yasuo Okuyama, Absolute Summability of Fourier Series and Orthogonal Series. VI, 118 pages. 1984.
- Vol. 1068: Number Theory, Noordwijkerhout 1983. Proceedings. Edited by H. Jager. V, 296 pages. 1984.
- Vol. 1069: M. Kreck, Bordism of Diffeomorphisms and Related Topics. III, 144 pages. 1984.
- Vol. 1070: Interpolation Spaces and Allied Topics in Analysis. Proceedings, 1983. Edited by M. Cwikel and J. Peetre. III, 239 pages. 1984.
- Vol. 1071: Padé Approximation and its Applications, Bad Honnef 1983. Proceedings. Edited by H. Werner and H.J. Bünger. VI, 264 pages. 1984.
- Vol. 1072: F. Rothe, Global Solutions of Reaction-Diffusion Systems. V, 216 pages. 1984.
- Vol. 1073: Graph Theory, Singapore 1983. Proceedings. Edited by K.M. Koh and H.P. Yap. XIII, 335 pages. 1984.
- Vol. 1074: E.W. Stredulinsky, Weighted Inequalities and Degenerate Elliptic Partial Differential Equations. III, 143 pages. 1984.
- Vol. 1075: H. Majima, Asymptotic Analysis for Integrable Connections with Irregular Singular Points. IX, 159 pages. 1984.
- Vol. 1076: Infinite-Dimensional Systems. Proceedings, 1983. Edited by F. Kappel and W. Schappacher. VII, 278 pages. 1984.
- Vol. 1077: Lie Group Representations III. Proceedings, 1982–1983. Edited by R. Herb, R. Johnson, R. Lipsman, J. Rosenberg. XI, 454 pages. 1984.
- Vol. 1078: A.J.E.M. Janssen, P. van der Steen, Integration Theory. V, 224 pages. 1984.
- Vol. 1079: W. Ruppert, Compact Semitopological Semigroups: An Intrinsic Theory. V, 260 pages. 1984.
- Vol. 1080: Probability Theory on Vector Spaces III. Proceedings, 1983. Edited by D. Szynal and A. Weron. V, 373 pages. 1984.
- Vol. 1081: D. Benson, Modular Representation Theory: New Trends and Methods. XI, 231 pages. 1984.
- Vol. 1082: C.-G. Schmidt, Arithmetik Abelscher Varietäten mit komplexer Multiplikation. X, 96 Seiten. 1984.
- Vol. 1083: D. Bump, Automorphic Forms on GL (3,IR). XI, 184 pages. 1984.
- Vol. 1084: D. Kletzing, Structure and Representations of Q-Groups. VI, 290 pages. 1984.
- Vol. 1085: G.K. Immink, Asymptotics of Analytic Difference Equations. V, 134 pages. 1984.
- Vol. 1086: Sensitivity of Functionals with Applications to Engineering Sciences. Proceedings, 1983. Edited by V. Komkov. V, 130 pages. 1984.
- Vol. 1087: W. Narkiewicz, Uniform Distribution of Sequences of Integers in Residue Classes. VIII, 125 pages. 1984.
- Vol. 1088: A.V. Kakosyan, L.B. Klebanov, J.A. Melamed, Characterization of Distributions by the Method of Intensively Monotone Operators. X, 175 pages. 1984.
- Vol. 1089: Measure Theory, Oberwolfach 1983. Proceedings. Edited by D. Kölzow and D. Maharam-Stone. XIII, 327 pages. 1984.
- Vol. 1090: Differential Geometry of Submanifolds. Proceedings, 1984. Edited by K. Kenmotsu. VI, 132 pages. 1984.
- Vol. 1091: Multifunctions and Integrands. Proceedings, 1983. Edited by G. Salinetti. V, 234 pages. 1984.
- Vol. 1092: Complete Intersections. Seminar, 1983. Edited by S. Greco and R. Strano. VII, 299 pages. 1984.
- Vol. 1093: A. Prestel, Lectures on Formally Real Fields. XI, 125 pages. 1984.
- Vol. 1094: Analyse Complexe. Proceedings, 1983. Edité par E. Amar, R. Gay et Nguyen Thanh Van. IX, 184 pages. 1984.
- Vol. 1095: Stochastic Analysis and Applications. Proceedings, 1983. Edited by A. Truman and D. Williams. V, 199 pages. 1984.
- Vol. 1096: Théorie du Potentiel. Proceedings, 1983. Edité par G. Mokobodzki et D. Pinchon. IX, 601 pages. 1984.
- Vol. 1097: R.M. Dudley, H. Kunita, F. Ledrappier, École d'Été de Probabilités de Saint-Flour XII – 1982. Edité par P.L. Hennequin. X, 396 pages. 1984.
- Vol. 1098: Groups – Korea 1983. Proceedings. Edited by A.C. Kim and B.H. Neumann. VII, 183 pages. 1984.
- Vol. 1099: C.M. Ringel, Tame Algebras and Integral Quadratic Forms. XIII, 376 pages. 1984.
- Vol. 1100: V. Ivrii, Precise Spectral Asymptotics for Elliptic Operators Acting in Fiberings over Manifolds with Boundary. V, 237 pages. 1984.
- Vol. 1101: V. Cossart, J. Giraud, U. Orbanz, Resolution of Surface Singularities. VII, 132 pages. 1984.
- Vol. 1102: A. Verona, Stratified Mappings – Structure and Triangulability. IX, 160 pages. 1984.
- Vol. 1103: Models and Sets. Proceedings, Logic Colloquium, 1983, Part I. Edited by G.H. Müller and M.M. Richter. VIII, 484 pages. 1984.
- Vol. 1104: Computation and Proof Theory. Proceedings, Logic Colloquium, 1983, Part II. Edited by M.M. Richter, E. Börger, W. Oberschelp, B. Schinzel and W. Thomas. VIII, 475 pages. 1984.
- Vol. 1105: Rational Approximation and Interpolation. Proceedings, 1983. Edited by P.R. Graves-Morris, E.B. Saff and R.S. Varga. XII, 528 pages. 1984.
- Vol. 1106: C.T. Chong, Techniques of Admissible Recursion Theory. IX, 214 pages. 1984.
- Vol. 1107: Nonlinear Analysis and Optimization. Proceedings, 1982. Edited by C. Vinti. V, 224 pages. 1984.
- Vol. 1108: Global Analysis – Studies and Applications I. Edited by Yu.G. Borisovich and Yu.E. Gliklikh. V, 301 pages. 1984.
- Vol. 1109: Stochastic Aspects of Classical and Quantum Systems. Proceedings, 1983. Edited by S. Albeverio, P. Combe and M. Sirugue-Collin. IX, 227 pages. 1985.
- Vol. 1110: R. Jajte, Strong Limit Theorems in Non-Commutative Probability. VI, 152 pages. 1985.
- Vol. 1111: Arbeitstagung Bonn 1984. Proceedings. Edited by F. Hirzebruch, J. Schwermer and S. Suter. V, 481 pages. 1985.
- Vol. 1112: Products of Conjugacy Classes in Groups. Edited by Z. Arad and M. Herzog. V, 244 pages. 1985.
- Vol. 1113: P. Antosik, C. Swartz, Matrix Methods in Analysis. IV, 114 pages. 1985.
- Vol. 1114: Zahlentheoretische Analysis. Seminar. Herausgegeben von E. Hlawka. V, 157 Seiten. 1985.
- Vol. 1115: J. Moulin Ollagnier, Ergodic Theory and Statistical Mechanics. VI, 147 pages. 1985.
- Vol. 1116: S. Stolz, Hochzusammenhängende Mannigfaltigkeiten und ihre Ränder. XXIII, 134 Seiten. 1985.
-

-
- Vol. 1117: D. J. Aldous, J. A. Ibragimov, J. Jacod, Ecole d'Été de Probabilités de Saint-Flour XIII – 1983. Édité par P.L. Hennequin. IX, 409 pages. 1985.
- Vol. 1118: Grossissements de filtrations: exemples et applications. Séminaire, 1982/83. Édité par Th. Jeulin et M. Yor. V, 315 pages. 1985.
- Vol. 1119: Recent Mathematical Methods in Dynamic Programming. Proceedings, 1984. Edited by I. Capuzzo Dolcetta, W.H. Fleming and T. Zolezzi. VI, 202 pages. 1985.
- Vol. 1120: K. Jarosz, Perturbations of Banach Algebras. V, 118 pages. 1985.
- Vol. 1121: Singularities and Constructive Methods for Their Treatment. Proceedings, 1983. Edited by P. Grisvard, W. Wendland and J.R. Whiteman. IX, 346 pages. 1985.
- Vol. 1122: Number Theory. Proceedings, 1984. Edited by K. Alladi. VII, 217 pages. 1985.
- Vol. 1123: Séminaire de Probabilités XIX 1983/84. Proceedings. Édité par J. Azéma et M. Yor. IV, 504 pages. 1985.
- Vol. 1124: Algebraic Geometry, Sitges (Barcelona) 1983. Proceedings. Edited by E. Casas-Alvero, G.E. Welters and S. Xambó-Descamps. XI, 416 pages. 1985.
- Vol. 1125: Dynamical Systems and Bifurcations. Proceedings, 1984. Edited by B.L.J. Braaksma, H.W. Broer and F. Takens. V, 129 pages. 1985.
- Vol. 1126: Algebraic and Geometric Topology. Proceedings, 1983. Edited by A. Ranicki, N. Levitt and F. Quinn. V, 523 pages. 1985.
- Vol. 1127: Numerical Methods in Fluid Dynamics. Edited by F. Brezzi. VII, 333 pages. 1985.
- Vol. 1128: J. Elschner, Singular Ordinary Differential Operators and Pseudodifferential Equations. 200 pages. 1985.
- Vol. 1129: Numerical Analysis, Lancaster 1984. Proceedings. Edited by P.R. Turner. XIV, 179 pages. 1985.
- Vol. 1130: Methods in Mathematical Logic. Proceedings, 1983. Edited by C.A. Di Prisco. VII, 407 pages. 1985.
- Vol. 1131: K. Sundaresan, S. Swaminathan, Geometry and Nonlinear Analysis in Banach Spaces. III, 116 pages. 1985.
- Vol. 1132: Operator Algebras and their Connections with Topology and Ergodic Theory. Proceedings, 1983. Edited by H. Araki, C.C. Moore, Ș. Strătilă and C. Voiculescu. VI, 594 pages. 1985.
- Vol. 1133: K. C. Kiwiel, Methods of Descent for Nondifferentiable Optimization. VI, 362 pages. 1985.
- Vol. 1134: G. P. Galdi, S. Rionero, Weighted Energy Methods in Fluid Dynamics and Elasticity. VII, 126 pages. 1985.
- Vol. 1135: Number Theory. Seminar, 1983–1984. Edited by D.V. Chudnovsky, G.V. Chudnovsky, H. Cohn and M. B. Nathanson. V, 283 pages. 1985.
- Vol. 1136: Quantum Probability and Applications II. Proceedings, 1984. Edited by L. Accardi and W. von Waldenfels. VI, 534 pages. 1985.
- Vol. 1137: Xiao G., Surfaces fibrées en courbes de genre deux. IX, 103 pages. 1985.
- Vol. 1138: A. Ocneanu, Actions of Discrete Amenable Groups on von Neumann Algebras. V, 115 pages. 1985.
- Vol. 1139: Differential Geometric Methods in Mathematical Physics. Proceedings, 1983. Edited by H. D. Doebner and J. D. Hennig. VI, 337 pages. 1985.
- Vol. 1140: S. Donkin, Rational Representations of Algebraic Groups. VII, 254 pages. 1985.
- Vol. 1141: Recursion Theory Week. Proceedings, 1984. Edited by H.-D. Ebbinghaus, G.H. Müller and G.E. Sacks. IX, 418 pages. 1985.
- Vol. 1142: Orders and their Applications. Proceedings, 1984. Edited by I. Reiner and K. W. Roggenkamp. X, 306 pages. 1985.
- Vol. 1143: A. Krieg, Modular Forms on Half-Spaces of Quaternions. XIII, 203 pages. 1985.
- Vol. 1144: Knot Theory and Manifolds. Proceedings, 1983. Edited by D. Rolfsen. V, 163 pages. 1985.
- Vol. 1145: G. Winkler, Choquet Order and Simplices. VI, 143 pages. 1985.
- Vol. 1146: Séminaire d'Algèbre Paul Dubreil et Marie-Paule Malliavin. Proceedings, 1983–1984. Édité par M.-P. Malliavin. IV, 420 pages. 1985.
- Vol. 1147: M. Wschebor, Surfaces Aléatoires. VII, 111 pages. 1985.
- Vol. 1148: Mark A. Kon, Probability Distributions in Quantum Statistical Mechanics. V, 121 pages. 1985.
- Vol. 1149: Universal Algebra and Lattice Theory. Proceedings, 1984. Edited by S. D. Comer. VI, 282 pages. 1985.
- Vol. 1150: B. Kawohl, Rearrangements and Convexity of Level Sets in PDE. V, 136 pages. 1985.
- Vol. 1151: Ordinary and Partial Differential Equations. Proceedings, 1984. Edited by B.D. Sleeman and R.J. Jarvis. XIV, 357 pages. 1985.
- Vol. 1152: H. Widom, Asymptotic Expansions for Pseudodifferential Operators on Bounded Domains. V, 150 pages. 1985.
- Vol. 1153: Probability in Banach Spaces V. Proceedings, 1984. Edited by A. Beck, R. Dudley, M. Hahn, J. Kuelbs and M. Marcus. VI, 457 pages. 1985.
- Vol. 1154: D.S. Naidu, A.K. Rao, Singular Perturbation Analysis of Discrete Control Systems. IX, 195 pages. 1985.
- Vol. 1155: Stability Problems for Stochastic Models. Proceedings, 1984. Edited by V.V. Kalashnikov and V.M. Zolotarev. VI, 447 pages. 1985.
- Vol. 1156: Global Differential Geometry and Global Analysis 1984. Proceedings, 1984. Edited by D. Ferus, R.B. Gardner, S. Helgason and U. Simon. V, 339 pages. 1985.
- Vol. 1157: H. Levine, Classifying Immersions into \mathbb{R}^4 over Stable Maps of 3-Manifolds into \mathbb{R}^2 . V, 163 pages. 1985.
- Vol. 1158: Stochastic Processes – Mathematics and Physics. Proceedings, 1984. Edited by S. Albeverio, Ph. Blanchard and L. Streit. VI, 230 pages. 1985.
- Vol. 1159: Schrödinger Operators, Como 1984. Seminar. Edited by S. Graffi. VIII, 272 pages. 1985.
- Vol. 1160: J.-C. van der Meer, The Hamiltonian Hopf Bifurcation. VI, 115 pages. 1985.
- Vol. 1161: Harmonic Mappings and Minimal Immersions, Montecatini 1984. Edited by E. Giusti. VII, 285 pages. 1985.
-