Contents

Preface vii

Discriminants and Local Invariants of Planar Fronts
Francesca Aicardi 1

Crofton Densities, Symplectic Geometry and Hilbert's Fourth Problem
J.C. Alvarez, I.M. Gelfand, and M. Smirnov 77

Projective Convex Curves
S. Anisov 93

Topological Classification of Real Trigonometric Polynomials and Cyclic Serpents Polyhedron
V. Arnold 101

Singularities of Short Linear Waves on the Plane
Ilia A. Bogaevski 107

New Generalizations of Poincaré's Geometric Theorem
Yu. V. Chekanov 113

Explicit Formulas for Arnold's Generic Curve Invariants
S. Chmutov and S. Duzhin 123

Nonlinear Integrable Equations and Nonlinear Fourier Transform
A.S. Fokas, I.M. Gelfand, and M.V. Zyskin 139

Elliptic Solutions of the Yang-Baxter Equation and Modular Hypergeometric Functions
Igor B. Frenkel and Vladimir G. Turaev 171

Combinatorics of Hypergeometric Functions Associated with Positive Roots
Israel M. Gelfand, Mark I. Graev, and Alexander Postnikov 205

Local Invariants of Mappings of Surfaces into Three-Space
Victor V. Goryunov 223

Theorem on Six Vertices of a Plane Curve Via Sturm Theory
L. Guieu, E. Mourre, and V. Yu. Ovsienko 257

The Arf-Invariant and the Arnold Invariants of Plane Curves
S.M. Gusein-Zade and S.M. Natanzon 267

Produit cyclique d'espaces et opérations de Steenrod
Max Karoubi 281

Characteristic Classes of Singularity Theory
M.É. Kazarian 325

Value of Generalized Hypergeometric Function at Unity
A. Kasarnovski-Krol 341

Harish-Chandra Decomposition for Zonal Spherical Function of type A_n
A. Kazarnovski-Krol 347

Positive Paths in the Linear Symplectic Group
François Lalonde and Dusa McDuff 361

Invariants of Submanifolds in Euclidean Space
V.D. Sedykh 389

On Combinatorics and Topology of Pairwise Intersections of Schubert Cells in SL_n/B
Boris Shapiro, Michael Shapiro, and Alek Vainshtein 397