

Progress in Mathematics

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Yan Soibelman • Yuri Tschinkel
Editors

Algebra, Geometry, and Physics in the 21st Century

Kontsevich Festschrift

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Photo courtesy of M. Kontsevich

Preface

This volume is a tribute to Maxim Kontsevich, one of the most original and influential mathematicians of our time.

Maxim's vision has inspired major developments in countless areas of mathematics, ranging all the way from probability theory to motives over finite fields, and brought forth a paradigm shift at the interface of modern geometry and mathematical physics. Kontsevich integrals (in knot theory), Kontsevich complex (in Hodge theory), Kontsevich propagator (in deformation quantization), Kontsevich conjecture (in combinatorics) are now firmly part of the *lingua franca* of modern mathematics. Many of his papers have opened completely new directions of research. The list of Maxim's spectacular achievements starts already with his Ph.D. thesis on the proof of Witten's conjecture. Soon thereafter, his formulation of Homological Mirror Symmetry became a catalyst for major developments in symplectic geometry, algebraic geometry, and string theory alike; and his work on deformation quantization has fundamentally changed the way mathematicians think about the subject.

Many of his lectures became turning points in the respective subjects. To mention just two such examples: motivic integration originated in his 1995 talk at Université Paris-Sud in Orsay, and Fukaya–Seidel categories were introduced in his 1998 lectures proposing a vast extension of the framework for mirror symmetry. More recent examples abound, some of them still waiting to be fully digested by the mathematical community; Maxim continues to open vast new mathematical landscapes for the rest of us to explore.

As a student of Israel Gelfand, Maxim inherited his ideas about the unity of mathematics. Undoubtedly, Maxim's work is itself a brilliant illustration of the unity of modern mathematics, as well as its deep connections to theoretical physics.

We have been fortunate to have interacted with Maxim on various mathematical projects. We have marveled many times at the avalanche of ideas that he generates in response to a question, even seemingly far-removed from his main research interests; the facility with which he resolves, instantaneously, difficult technical problems; his vision; his generosity, curiosity, and kindness. We offer this volume to him, in friendship and admiration.

August 2016

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