

S. G. Dani · Athanase Papadopoulos *Editors*

Geometry in History

This is a collection of surveys on important mathematical ideas, their origin, their evolution and their impact in current research. The authors are mathematicians who are leading experts in their fields. The book is addressed to all mathematicians, from undergraduate students to senior researchers, regardless of the specialty.

Mathematics

ISBN 978-3-030-13608-6



► [springer.com](https://www.springer.com)



1	Plato on Geometry and the Geometers	1
	Stelios Negrepontis	
2	Topology and Biology: From Aristotle to Thom	89
	Athanase Papadopoulos	
3	Time and Periodicity from Ptolemy to Schrödinger: Paradigm Shifts vs Continuity in History of Mathematics	129
	Yuri I. Manin	
4	Convexity in Greek Antiquity	139
	Athanase Papadopoulos	
5	On the Concept of Curve: Geometry and Algebra, from Mathematical Modernity to Mathematical Modernism	153
	Arkady Plotnitsky	
6	From Euclid to Riemann and Beyond: How to Describe the Shape of the Universe	213
	Toshikazu Sunada	
7	A Path in History, from Curvature to Convexity	305
	Annette A'Campo-Neuen and Athanase Papadopoulos	
8	The Axiomatic Destiny of the Theorems of Pappus and Desargues...	355
	Victor Pambuccian and Celia Schacht	
9	Projective Configuration Theorems: Old Wine into New Wineskins	401
	Serge Tabachnikov	
10	Poincaré's Geometric Worldview and Philosophy	435
	Ken'ichi Ohshika	

11	Perturbing a Planar Rotation: Normal Hyperbolicity and Angular Twist	451
	Alain Chenciner	
12	René Thom and an Anticipated h-Principle	469
	François Laudenbach	
13	Rigid and Flexible Facets of Symplectic Topology	493
	Yakov Eliashberg	
14	Flat Affine, Projective and Conformal Structures on Manifolds: A Historical Perspective	515
	William M. Goldman	
15	Basic Aspects of Differential Geometry	553
	Marc Chaperon	
16	The Global Study of Riemannian-Finsler Geometry	581
	Katsuhiko Shiohama and Bankteshwar Tiwari	
17	The Poincaré Conjecture and Related Statements	623
	Valerii N. Berestovskii	
18	A Glimpse into the Problems of the Fourth Dimension	687
	Valentin Poénaru	
19	Memories from My Former Life: The Making of a Mathematician	705
	Valentin Poénaru	
	Index	735