Contents

Part I Summary A Historical Glimpse of Some Topics in Complex Geometry 3 Lizhen Ji Part II Comments on Yau and His Work Calabi-Yau Manifolds at the Interface of Mathematics and Physics 81 Shiu-Yuen Cheng, Lizhen Ji, Liping Wang, and Hao Xu Lizhen Ji Part III Selected Papers in Complex Geometry Foundations for a General Theory of Functions of a Complex Variable Bernhard Riemann

ii Contents

The Hypotheses on Which Geometry Is Based Bernhard Riemann	125
A Mathematical Work That Seeks to Answer the Question Posed by the Most Distinguished Academy of Paris Bernhard Riemann	129
About a Remarkable Hermitian Metric	133
Characteristic Classes of Hermitian Manifolds	149
On Compact Complex Analytic Varieties	189
The Space of Kähler Metrics	209
On Kähler Manifolds with Vanishing Canonical Class Eugenio Calabi	211
On a Differential-Geometric Method in the Theory of Analytic Stacks	223
On Kähler Varieties of Restricted Type	231
On the Complex Projective Spaces	253
A Lefschetz Fixed Point Formula for Elliptic Differential Operators Michael Atiyah and Raoul Bott	269
Calabi's Conjecture and Some New Results in Algebraic Geometry Shing-Tung Yau	277

Contents iii

On the Ricci Curvature of a Compact Kähler Manifold and	
the Complex Monge-Ampère Equation, I	285
Compact Kähler Manifolds of Positive Bisectional Curvature Yum-Tong Siu and Shing-Tung Yau	349
The Complex-Analyticity of Harmonic Maps and the Strong Rigidity of Compact Kähler Manifolds	367
A New Proof of a Theorem of Narasimhan and Seshadri Simon Donaldson	411
Anti Self-Dual Yang-Mills Connections over Complex Algebraic Surfaces and Stable Vector Bundles	421
On the Existence of Hermitian Yang-Mills Connections in Stable Vector Bundles Karen Uhlenbeck and Shing-Tung Yau	453
A Brief History of Kähler Geometry	489
$\mathbf{Part} \mathbf{I\!V}$	
Selected Commentaries by Shing-Tung Yau	523
Part V	
A List of Classic Papers	631
Some Classic Papers in Geometric Analysis in the 20th Century Ligher Ligand Shing Tung Very	633
Lizhen Ji and Shing-Tung Yau	