

## Mirror Symmetry III

### Description

This book presents surveys from a workshop held during the theme year in geometry and topology at the Centre de recherches mathématiques (CRM, University of Montréal). The volume is in some sense a sequel to *Mirror Symmetry I* (1998) and *Mirror Symmetry II* (1996), copublished by the AMS and International Press.

Included are recent developments in the theory of mirror manifolds and the related areas of complex and symplectic geometry. The long introductory articles explain the key physical ideas and motivation, namely conformal field theory, supersymmetry, and string theory. Open problems are emphasized. Thus the book provides an efficient way for a very broad audience of mathematicians and physicists to reach the frontier of research in this fast expanding area.

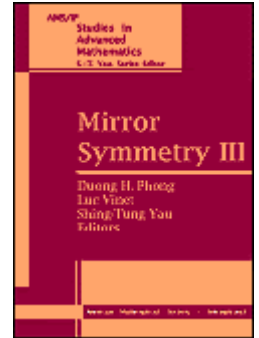
### Features

- *Crucial research pertaining to future developments in algebraic and symplectic geometry and to the physics of unified string theories*
- *Well-known authors who are leaders in the field*
- *Introductory article by Greene and Yau*
- *A solid and even blend of ideas and techniques from both mathematics and*

Editors: Duong H. Phong, Luc Vinet and Shing Tung Yau  
 ISBN:0-8218-1193-2  
 Year Published: 1999  
 Page: 312 pp  
 Binding: Hardcover  
 Price: \$44 (Sales: only \$22 !)

### Table of Contents

1. B. R. Greene ~ Aspects of quantum geometry
2. S.-T. Yau ~ Introduction to enumerative invariants
3. T. H. Parker ~ Compactified moduli spaces of pseudo-holomorphic curves
4. M. Verbitsky ~ Mirror symmetry for hyper-Kähler manifolds
5. M. Gross ~ Connecting the web: A prognosis
6. A. Klemm and P. Mayr ~ Strong coupling singularities and non-abelian gauge symmetries in  $\mathcal{N} = 2$  string theory
7. S. Kachru ~ Remarks on (0,2) Calabi-Yau models
8. K. Liu ~ Relations among fixed point
9. J. Jorgenson and A. Todorov ~ An analytic discriminant for polarized algebraic  $K3$  surfaces
10. D. R. Morrison ~ Through the looking glass
11. B. Siebert ~ An update on (small) quantum cohomology



## Mirror Symmetry IV

### *Calabi-Yau Manifolds, Mirror Symmetry, and Symplectic Geometry*

- B. H. Lian, K. Liu, and S.-T. Yau ~ A survey of mirror principle
- B. R. Greene ~ Mirror symmetry: aspects of the first 10 years
- W.-D. Ruan ~ Lagrangian torus fibrations of Calabi-Yau hypersurfaces in toric varieties and SYZ mirror symmetry conjecture
- G. Liu ~ Moduli space of stable maps
- F. Lalonde and D. McDuff ~ Cohomological properties of ruled symplectic structures

### *Supersymmetric gauge theories and integrable models*

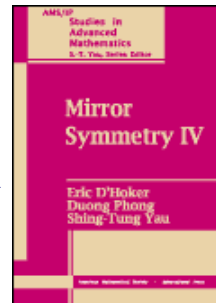
- J. C. Hurtubise ~ Spectral Lax pairs and Calogero-Moser systems
- I. P. Ennes, C. Lozano, S. G. Naculich, H. Rhedin, and H. J. Schnitzer ~ M-theory tested by  $\mathcal{N} = 2$  Seiberg-Witten theory
- I. P. Ennes, C. Lozano, S. G. Naculich, and H. J. Schnitzer ~ Seiberg-Witten curves for elliptic models
- I. Krichever and K. L. Vaninsky ~ The periodic and open Toda lattice
- J.-L. Gervais ~ Exact integration methods for supersymmetric Yang-Mills theory
- *M-theory, D-branes, and non-commutative geometry*
- R. C. Meyers ~ Nonabelian D-branes and noncommutative geometry
- P. Pouliot ~ Evidence for winding states in noncommutative quantum field theory
- K. G. Savvidy ~ The discrete bound state spectrum of the rotating D0-brane system, and its decay by emission of Ramond-Ramond field radiation
- F. Denef ~ On the correspondence between D-branes and stationary supergravity solutions of type II Calabi-Yau compactifications
- M. Faux, D. Lüst, and B. A. Ovrut ~ Phase-transitions and tensor dynamics in M-theory
- N. A. Obers and B. Pioline ~ Duality, Eisenstein series and exact thresholds

### *Strings, gauge theories, and AdS/CFT correspondence*

- E. Witten and S.-T. Yau ~ Connectedness of the boundary in the AdS/CFT correspondence
- S.-T. Yau ~ A note on the topology of the boundary in the AdS/CFT correspondence
- M. Porrati and A. Starinets ~ Holographic duals of 4D field theories
- D. Kabat, G. Lifschytz, and D. A. Lowe ~ Black hole thermodynamics from calculations in strongly-coupled gauge theory
- O. Lunin and S. D. Mathur ~ Correlation functions for orbifolds of the type  $M^N/S^N$

### *Elliptic genera and automorphic forms*

- L. A. Borisov and A. Libgober ~ Elliptic genera of singular varieties, orbifold elliptic genus and chiral de Rham



Editors: E. D'Hoker, D.H. Phong and S. T. Yau  
 ISBN:0-8218-3335-9  
 Year Published: 2002  
 Page: 381 pp  
 Binding: Hardcover  
 Price: \$69

### Description

The volume presents a broad survey of many of the noteworthy developments that have taken place in string theory, geometry, and duality since the mid 1990s. Some of the topics emphasized include the following: Integrable models and supersymmetric gauge theories; theory of M- and D-branes and noncommutative geometry; duality between strings and gauge theories; and elliptic genera and automorphic forms. Several introductory articles present an overview of the geometric and physical aspects of mirror symmetry and of corresponding developments in symplectic geometry. The book provides an efficient way for a very broad audience of mathematicians and physicists to explore the frontiers of research into this rapidly expanding area.