

Contents

Foreword: MASS and REU at Penn State University	vii
Preface	ix
Chapter 1. Motivation: Mechanics and Optics	1
Chapter 2. Billiard in the Circle and the Square	21
Chapter 3. Billiard Ball Map and Integral Geometry	33
Chapter 4. Billiards inside Conics and Quadrics	51
Chapter 5. Existence and Non-existence of Caustics	73
Chapter 6. Periodic Trajectories	99
Chapter 7. Billiards in Polygons	113
Chapter 8. Chaotic Billiards	135
Chapter 9. Dual Billiards	147
Bibliography	167
Index	175