

Contents

Dedication vii

Foreword..... ix

Foreword to the First Edition xi

Preface to the First Edition xiii

Preface to the Second Edition xvii

Acknowledgments xxi

About the Authors..... xxiii

Part I Space Engines: Past and Present

1 An Historical Introduction to Space Propulsion 3

2 The Rocket: How It Works in Space 13

3 Rocket Problems and Limitations 23

4 Non-Rocket In-Space Propulsion 35

5 The Solar Sail Option: From the Oceans to Space 45

Part II Space Missions by Sail

6 Principles of Space Sailing 61

7 What Is a Space Sailcraft? 67

8 Sails Versus Rockets..... 73

9 Exploring and Developing Space by Sailcraft 83

10 Riding a Beam of Light..... 103

Part III Construction of Sailcraft

11 Designing a Solar Sail..... 113

12 Building a Sailcraft 127

13 Progress to Date 143

14 Future Plans 155

Part IV Breakthroughs in Space

15 The JAXA IKAROS Mission as a Technological Breakthrough 165

16 The NanoSAIL-D2 NASA Mission 173

17 New Projects in Progress 179

Part V Space Sailing: Some Technical Aspects

18 Space Sources of Light..... 189

19 Modeling Thrust from Electromagnetic Radiation Pressure..... 205

20 Sailcraft Trajectories 223

21 Sails in the Space Environment 247

Glossary 261

Index..... 267

Solar Sails

A Novel Approach to Interplanetary Travel

Vulpetti, G.; Johnson, L.; Matloff, G.L.

2015, XXIV, 277 p. 89 illus., 39 illus. in color., Softcover

ISBN: 978-1-4939-0940-7