

Contents



<i>Preface</i>	ix
1. The Basics	1
Orbits	1
Formation Flying	9
Safety Tethers	11
Artificial Gravity	13
Probe Towing	16
Comet and Asteroid Sample Return	17
Aerobraking	18
Artificial Gravity Assist	18
Momentum Exchange	20
Cable Catapults	22
Electrodynamic Tethers	23
Electrostatic Tethers	27
Beanstalks	29
2. Disruptive Technology	33
New Machines	33
Rocket Propulsion Limits and Limitations	34
Electric Propulsion	43
Solar Sailing	45
Another Way Forward	47
3. Dreams and Ideas	49
Visions of the Future	49
Fiction and Fascination	55
4. Early Experiments	59
Gemini 11	59
Gemini 12	63

Suborbital	65
Space Shuttle Experiments	70
Satellite Experiments	76
Still Learning	92
5. Into Earth Orbit and Beyond	93
De-Orbiting	93
Spacecraft Stabilization	98
Atmospheric Research	99
Let's Stay Together	101
Gravity in Space	106
One Up, One Down	111
From the Ground Up	124
Tether Propulsion	130
Jupiter	134
Cleaning Up the Belts	138
6. Space Elevators	143
Who Wants a Space Elevator?	143
Building a Beanstalk	147
12,000,000th Floor: Space	153
Out of Order	162
Step by Step	166
Elevators on the Moon and Mars	169
The Aerovator Alternative	172
Space Elevator Versus the Aerovator	176
7. Challenges	179
Cable Material	179
Tether Stability and Control	182
Damage Protection	185
The Price Tag	188
8. Conclusion	193
<i>More to Read</i>	194
<i>Bibliography</i>	197
<i>Books and Reports</i>	197
<i>Papers, Articles, and Presentations</i>	199
<i>Webpages</i>	209
<i>Index</i>	213



<http://www.springer.com/978-0-387-76555-6>

Space Tethers and Space Elevators

van Pelt, M.

2009, X, 215 p., Hardcover

ISBN: 978-0-387-76555-6