

# Contents

<b>1</b>	<b>Overview</b>	1
	Michele K. Dougherty, Larry W. Esposito, and Stamatis M. Krimigis	
<b>2</b>	<b>Review of Knowledge Prior to the Cassini-Huygens Mission and Concurrent Research</b>	9
	Glenn S. Orton, Kevin H. Baines, Dale Cruikshank, Jeffrey N. Cuzzi, Stamatis M. Krimigis, Steve Miller, and Emmanuel Lellouch	
<b>3</b>	<b>Origin of the Saturn System</b>	55
	Torrence V. Johnson and Paul R. Estrada	
<b>4</b>	<b>The Interior of Saturn</b>	75
	William B. Hubbard, Michele K. Dougherty, Daniel Gautier, and Robert Jacobson	
<b>5</b>	<b>Saturn: Composition and Chemistry</b>	83
	Thierry Fouchet, Julianne I. Moses, and Barney J. Conrath	
<b>6</b>	<b>Saturn Atmospheric Structure and Dynamics</b>	113
	Anthony D. Del Genio, Richard K. Achterberg, Kevin H. Baines, F. Michael Flasar, Peter L. Read, Agustín Sánchez-Lavega, and Adam P. Showman	
<b>7</b>	<b>Clouds and Aerosols in Saturn's Atmosphere</b>	161
	R.A. West, K.H. Baines, E. Karkoschka, and A. Sánchez-Lavega	
<b>8</b>	<b>Upper Atmosphere and Ionosphere of Saturn</b>	181
	Andrew F. Nagy, Arvydas J. Kliore, Michael Mendillo, Steve Miller, Luke Moore, Julianne I. Moses, Ingo Müller-Wodarg, and Don Shemansky	
<b>9</b>	<b>Saturn's Magnetospheric Configuration</b>	203
	Tamas I. Gombosi, Thomas P. Armstrong, Christopher S. Arridge, Krishan K. Khurana, Stamatis M. Krimigis, Norbert Krupp, Ann M. Persoon, and Michelle F. Thomsen	
<b>10</b>	<b>The Dynamics of Saturn's Magnetosphere</b>	257
	D.G. Mitchell, J.F. Carbary, S.W.H. Cowley, T.W. Hill, and P. Zarka	
<b>11</b>	<b>Fundamental Plasma Processes in Saturn's Magnetosphere</b>	281
	B.H. Mauk, D.C. Hamilton, T.W. Hill, G.B. Hospodarsky, R.E. Johnson, C. Paranicas, E. Roussos, C.T. Russell, D.E. Shemansky, E.C. Sittler Jr., and R.M. Thorne	

---

<b>12</b>	<b>Auroral Processes</b>	333
	W.S. Kurth, E.J. Bunce, J.T. Clarke, F.J. Crary, D.C. Grodent, A.P. Ingersoll, U.A. Dyudina, L. Lamy, D.G. Mitchell, A.M. Persoon, W.R. Pryor, J. Saur, and T. Stallard	
<b>13</b>	<b>The Structure of Saturn's Rings</b>	375
	J.E. Colwell, P.D. Nicholson, M.S. Tiscareno, C.D. Murray, R.G. French, and E.A. Marouf	
<b>14</b>	<b>Dynamics of Saturn's Dense Rings</b>	413
	Jürgen Schmidt, Keiji Ohtsuki, Nicole Rappaport, Heikki Salo, and Frank Spahn	
<b>15</b>	<b>Ring Particle Composition and Size Distribution</b>	459
	Jeff Cuzzi, Roger Clark, Gianrico Filacchione, Richard French, Robert Johnson, Essam Marouf, and Linda Spilker	
<b>16</b>	<b>Diffuse Rings</b>	511
	M. Horányi, J.A. Burns, M.M. Hedman, G.H. Jones, and S. Kempf	
<b>17</b>	<b>Origin and Evolution of Saturn's Ring System</b>	537
	Sébastien Charnoz, Luke Dones, Larry W. Esposito, Paul R. Estrada, and Matthew M. Hedman	
<b>18</b>	<b>The Thermal Evolution and Internal Structure of Saturn's Mid-Sized Icy Satellites</b>	577
	Dennis L. Matson, Julie C. Castillo-Rogez, Gerald Schubert, Christophe Sotin, and William B. McKinnon	
<b>19</b>	<b>Icy Satellites of Saturn: Impact Cratering and Age Determination</b>	613
	Luke Dones, Clark R. Chapman, William B. McKinnon, H. Jay Melosh, Michelle R. Kirchoff, Gerhard Neukum, and Kevin J. Zahnle	
<b>20</b>	<b>Icy Satellites: Geological Evolution and Surface Processes</b>	637
	Ralf Jaumann, Roger N. Clark, Francis Nimmo, Amanda R. Hendrix, Bonnie J. Buratti, Tilmann Denk, Jeffrey M. Moore, Paul M. Schenk, Steve J. Ostro, and Ralf Srama	
<b>21</b>	<b>Enceladus: An Active Cryovolcanic Satellite</b>	683
	John R. Spencer, Amy C. Barr, Larry W. Esposito, Paul Helfenstein, Andrew P. Ingersoll, Ralf Jaumann, Christopher P. McKay, Francis Nimmo, and J. Hunter Waite	
<b>22</b>	<b>The Cassini Extended Mission</b>	725
	David A. Seal and Brent B. Buffington	
<b>23</b>	<b>Saturn's Exploration Beyond Cassini-Huygens</b>	745
	Tristan Guillot, Sushil Atreya, Sébastien Charnoz, Michele K. Dougherty, and Peter Read	
<b>24</b>	<b>Cartographic Mapping of the Icy Satellites Using ISS and VIMS Data</b>	763
	Th. Roatsch, R. Jaumann, K. Stephan, and P.C. Thomas	
<b>Appendix: The Cassini Orbiter, Behind the Scenes</b>		783
<b>Index</b>		795