

## CONTENTS

1.1	Introduction	7
1.2	Seeing the Sun's surface	7
1.3	Seeing the Sun's inner atmosphere	18
1.4	Seeing the Sun's outer atmosphere	30
1.5	Summary of Chapter 1	39
2.1	Introduction	43
2.2	Inside the Sun	43
2.3	Solar activity	63
2.4	The Sun in space	74
2.5	Summary of Chapter 2	82
3.1	Introduction	85
3.2	Stars in space	86
3.3	The stars as bodies	100
3.4	Measuring stellar masses and radii using binary stars	112
3.5	Stellar spectroscopy	118
3.6	Summary of Chapter 3	128
4.1	Introduction	133
4.2	The Hertzsprung–Russell diagram	133
4.3	Observing through the interstellar medium	144
4.4	Summary of Chapter 4	153
5.1	Introduction	157
5.2	Conception	157
5.3	Starbirth	165
5.4	Summary of Chapter 5	177
6.1	Introduction	179
6.2	Stellar structure	179
6.3	Nuclear reactions	187
6.4	Stellar masses	193
6.5	Summary of Chapter 6	201

7.1	Introduction	203
7.2	Post main sequence lifetime of low-mass stars	203
7.3	Post main sequence lifetime of high-mass stars	213
7.4	The influence of binarity	220
7.5	Summary of Chapter 7	221
8.1	Introduction	223
8.2	The death of low-mass stars	223
8.3	The death of high-mass stars – supernovae and related events	227
8.4	Feeding the interstellar medium	236
8.5	Summary of Chapter 8	244
9.1	Introduction	247
9.2	White dwarfs	247
9.3	Neutron stars	251
9.4	Black holes	262
9.5	Stellar remnants in binary systems	266
9.6	Gamma-ray bursts	278
9.7	Summary of Chapter 9	280
Appendix A1	Useful quantities and units	329
Appendix A2	Stellar nomenclature	330
Appendix A3	The 50 closest star systems to the Sun	333
Appendix A4	The 100 brightest stars visible from Earth	336
Appendix A5	The chemical elements and their abundances in the solar photosphere	340