

Philip M. Bagnall

Atlas of Meteor Showers

A Practical Workbook for Meteor Observers

Contents

1	Introduction	1
	About Time!.	2
	Radiants	3
	Major Showers and Minor Showers	5
	Shower Names.	6
	The Zenithal Hourly Rate (ZHR)	6
	Magnitude Distribution Graphs.	8
2	Meteors	11
	A Meteor Event	15
	The Zodiacal Dust Cloud.	18
	The View from Earth	20
	References	23
3	Meteoroid Steams and Meteor Showers	25
	The Structure of the Solar System.	25
	The Structure and Behaviour of Comets	30
	Comets and Meteoroid Streams.	31
	Active Asteroids and Meteoroid Streams	33
	Types of Meteor Showers	33
	Summary	35
	References	36
4	Observing Meteor Showers.	37
	Before You Start.	38
	Essentials.	43
	The Observing Session	44
	Fireballs and Bolides	48
	Adding a Camera to Your Meteor Watch.	48
	Analysing Your Observations	48
	Mathematical Approach.	50
	And Why Not Try...	52

5 The Major Meteor Showers: January to August	53
Introduction	53
Activity and Additional Data Tables	53
Charts, Graphs and Diagrams	55
The Quadrantids	58
The April Lyrids	78
The η -Aquariids	100
The Southern δ -Aquariids	120
The Perseids	142
References	168
6 The Major Meteor Showers: October to December	171
The Orionids	171
The Taurids	196
The Leonids	224
The Geminids	246
The Ursids	270
References	285
7 Discovering Minor Showers	287
Type 1: Remnant Shower	287
Type 2: Close Approach	290
Type 3: One-Off Display	290
Type 4: New Shower	290
Type 5: Developing Shower	296
Type 6: Variable Activity Shower	299
Ones to Watch	304
α -Centaurids (ACE)	304
June Boötids (JBO)	306
Aurigids (AUR)	310
Piscis Austrinids (PAU)	312
September ϵ -Perseids (SPE)	315
November Orionids (NOO)	318
Southern χ -Orionids (ORS)	318
σ -Hydrids (HYD)	318
Phoenicids (PHO)	320
December Monocerotids (MON)	323
Puppis-Velids (PUP)	324
Observing Minor Showers	326
References	327
Appendix A: Greek Alphabet	329
Appendix B: Constellation Abbreviations and Meteor Shower Names	331
Appendix C: Right Ascension to Degrees Conversion Table	335
Appendix D: Glossary, Symbols and Abbreviations	337
Appendix E: Wind Chill Chart	345

Contents	xix
Appendix F: Visual Meteor Observation Form	347
Appendix G: Magnitude Comparison Charts	349
Appendix H: Gnomonic Plotting Charts	367
Appendix I: Minor Meteor Showers	397
Appendix J: Major Meteor Showers	401
Author Index	403
Subject Index	407