

# A practical guide to lightcurve photometry and analysis

by Brian D. Warner

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Written by a keen amateur astronomer, this book aims to explain and facilitate how one goes about the photometric study of asteroids and (to a lesser extent) variable stars, and in particular how to combine observational data so as to derive the period and form of the lightcurve.

Although some very good books have been written on the topic of photometry, none of these in the past have dealt adequately with this particular subject. So with its appearance, Brian Warner has provided a useful service to all those would-be amateurs, who, equipped with a small telescope and CCD camera, wish to make worthwhile observations to determine the rotation rate, size and shape of asteroids. Though this may sound a rather complex subject, the author has avoided being too technical thereby ensuring a wide readership amongst the amateur community.

Brian Warner is a very active observer himself, and has done much to further the development of asteroid studies. For instance, he writes a regular article in the *Minor Planet Bulletin* and has written a good deal of software including MPO Connections, Canopus and PhotoRed, all of which are available commercially, and which can be used to measure images and carry out photometric analyses. Indeed, although not strictly necessary, the latter two software routines are a useful adjunct to the book itself so if you are interested in acquiring this book you should also look at the software, details of which can also be found on the author's Website, [www.MinorPlanetObserver.com](http://www.MinorPlanetObserver.com).

Being somewhat of a first, the author addresses a wide variety of topics including photometry with filters, transforming to standard magnitudes, air mass, extinction, telescopes, CCD cameras, image acquisition and photometric software. He does not plunge into any one topic in great detail but rather gives a broader perspective, often giving his own view and tips from his first-hand experience with illustrative examples taken from his own observing successes. The author writes in a style which speaks directly to the reader with many anecdotes and raising

many issues and questions, to which he gives his own opinions, advice and answers. As such it is a good book for anyone who has a telescope and CCD camera and who has been looking to contribute to the scientific understanding of asteroids or eclipsing variables but who has not yet summoned up sufficient energy to take the plunge: this book should keep you from drowning!

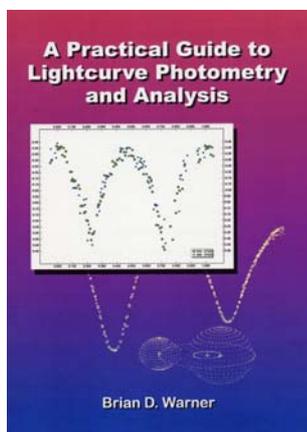
There are some very useful appendices (9 in all) including a bibliography, key websites, worked examples for determining atmospheric extinction, CCD calibration, and charts of fields containing Landolt standard stars

as well as close-up fields (0.5° square) provided by Arne Henden of the US Naval Observatory, Flagstaff containing B, V and R secondary standards suitable for photometric calibration.

As a first edition, written and published by the author himself, the book has some limitations. Notably, it contains numerous errors, most of

which are annoying rather than fatal. Some errors are typographical or grammatical in nature. Others are more serious such as the formula on page 83 for determining extinction by the Hardie method, which is incorrect. This reviewer also found that many of the figures, being computer screen-dumps, were reproduced on too small a scale to be readable: this is where having the MPO software running alongside would have helped. Many graphs are not adequately labelled or are labelled in too small a font size. Also, the observing methodology expounded is very much the personal preference of the author and, as such, is a mirror of the MPO software, although reference to alternative image analysis and photometric software is given in the book.

Overall, the book is certainly a start, a good start, and will be a valuable resource and practical guide for the active observer. The subject of asteroid photometry in the hands of the amateur is a fast-evolving one, with many more advances to be expected in the coming few years. This book should help to facilitate these.



## Richard Miles

*Dr Richard Miles, as Assistant Director of the Asteroids and Remote Planets Section of the BAA, is an old hand at lightcurve photometry, having obtained his first composite lightcurve of an asteroid in 1983 and gone on to determine the rotation periods of several previously-unobserved asteroids.*