

## BOOK REVIEW POLICY

Books may be requested from the Book Review Editor, Richard Marchand, by using the online book request form at <http://www.cap.ca>. You must be a residing in Canada to request a book.

CAP members are given the first opportunity to request books. For non-members, only those residing in Canada may request a book. Requests from non-members will only be considered one month after the distribution date of the issue of *Physics in Canada* in which the book was published as being available.

The Book Review Editor reserves the right to limit the number of books provided to reviewers each year. He also reserves the right to modify any submitted review for style and clarity. When rewording is required, the Book Review Editor will endeavour to preserve the intended meaning and, in so doing, may find it necessary to consult the reviewer. Reviewers submit a 300-500 word review for publication in PiC and posting on the website; however, they can choose to submit a longer review for the website together with the shorter one for PiC.

## LA POLITIQUE POUR LA CRITIQUE DE LIVRES

*Si vous voulez faire l'évaluation critique d'un ouvrage, veuillez entrer en contact avec le responsable de la critique de livres, Richard Marchand, en utilisant le formulaire de demande électronique à <http://www.cap.ca>.*

*Les membres de l'ACP auront priorité pour les demandes de livres. Ceux qui ne sont pas membres et qui résident au Canada peuvent faire une demande de livres. Les demandes des non-membres ne seront examinées qu'un mois après la date de distribution du numéro de la Physique au Canada dans lequel le livre aura été déclaré disponible.*

*Le Directeur de la critique de livres se réserve le droit de limiter le nombre de livres confiés chaque année aux examinateurs. Il se réserve, en outre, le droit de modifier toute critique présentée afin d'en améliorer le style et la clarté. S'il lui faut reformuler une critique, il s'efforcera de conserver le sens voulu par l'auteur de la critique et, à cette fin, il pourra juger nécessaire de le consulter. Les critiques pour publication dans la PaC doivent être de 300 à 500 mots. Ces critiques seront aussi affichées sur le web; s'ils le désirent les examinateurs peuvent soumettre une plus longue version pour le web.*

## BOOKS RECEIVED / LIVRES REÇUS

The following titles are a sampling of books that have recently been received for review. Readers are invited to write reviews, in English or French, of books of interest to them. Unless otherwise indicated, all prices are in Canadian dollars.

Lists of all books available for review, books out for review and book reviews published since 2011 are available on-line at [www.cap.ca](http://www.cap.ca) (Publications).

In addition to books listed here, readers are invited to consider writing reviews of recent publications, or comparative reviews on books in topics of interest to the physics community. This could include for example, books used for teaching and learning physics, or technical references aimed at professional researchers.

*Les titres suivants sont une sélection des livres reçus récemment aux fins de critique. Nous invitons nos lecteurs à nous soumettre une critique en anglais ou en français, sur les sujets de leur choix. Sauf indication contraire, tous les prix sont en dollars canadiens.*

*Les listes de tous les livres disponibles pour critique, ceux en voie de révision, ainsi que des critiques publiées depuis 2011 sont disponibles sur : [www.cap.ca](http://www.cap.ca) (Publications).*

*En plus des titres mentionnés ci-dessous, les lecteurs sont invités à soumettre des revues sur des ouvrages récents, ou des revues thématiques comparées sur des sujets particuliers. Celles-ci pourraient par exemple porter sur des ouvrages de nature pédagogique, ou des textes de référence destinés à des professionnels.*

### GENERAL / GÉNÉRAL

**THE PHYSICS OF POLARIZED TARGETS**, Tapio O. Niinikoski, Cambridge University Press, 2020; pp. 530; ISBN: 978-1108475075; Price: 218.95.

**THEORY OF SIMPLE GLASSES: EXACT SOLUTIONS IN INFINITE DIMENSIONS**, Giorgio Parisi, Pierfrancesco Urbani & Francesco Zamponi, Cambridge University Press, 2020; pp. 349; ISBN: 978-1107191075; Price: 91.95.

### UNDERGRADUATE LEVEL / NIVEAU DE PREMIER CYCLE

**PRINCIPLES OF OPTICS: 60TH ANNIVERSARY EDITION**, Max Born & Emil Wolf, Cambridge University Press, 2019; pp. 992; ISBN: 978-1108477437; Price: 79.95.

**THE COSMIC REVOLUTIONARY'S HANDBOOK: (OR: HOW TO BEAT THE BIG BANG)**, Luke A. Barnes & Geraint F. Lewis, Cambridge University Press, 2020; pp. 286; ISBN: 978-1108486705; Price: 25.95.

**THEORETICAL CONCEPTS IN PHYSICS AN ALTERNATIVE VIEW OF THEORETICAL REASONING IN PHYSICS (3D ED.)** [v], Malcolm S. Longair, Cambridge University Press, 2020; pp. 636; ISBN: 9781108484534; Price: 68.95.

### SENIOR LEVEL / NIVEAU SUPÉRIEUR

**INVARIANT IMBEDDING T-MATRIX METHOD FOR LIGHT SCATTERING BY NONSPHERICAL AND INHOMOGENEOUS PARTICLES**, Bingqiang Sun, Lei Bi, Ping Yang, Michael Kahnert and George Kattawar, Elsevier, 2020; pp. 262; ISBN: 978-0-12-818090-7; Price: 158.11.

**MEAN FIELD THEORY**, Vladimir M Kolomietz, Shalom Shlomo [v], World Scientific, 2020; pp. 588; ISBN: 978-981-121-177-5; Price: 252.95.

**PEAR-SHAPED NUCLEI**, Suresh C Pancholi, World Scientific, 2020; pp. 192; ISBN: 978-981-121-759-3; Price: 121.61.

**STATISTICS, DATA MINING, AND MACHINE LEARNING IN ASTRONOMY: A PRACTICAL PYTHON GUIDE FOR THE ANALYSIS OF SURVEY DATA, UPDATED EDITION**, Zeljko Ivezić, Andrew J. Connolly, Jacob T. VanderPlas, and Alexander Gray, Princeton University Press, 2019; pp. 560; ISBN: 9780691198309; Price: 103.58.

## BOOK REVIEWS / CRITIQUES DE LIVRES

**FURTHER ADVENTURES OF THE CELESTIAL SLEUTH**, by Olson, Donald W., Springer, 2018, pp. 334, ISBN: 978-3-319-70319-0, price 32.84.

I selected this book because I was intrigued by its premise: using astronomy to solve mysteries regarding the time, date and location of the origins of works of art. As a secondary school physics teacher, I am always interested in finding other ways to teach students about the applications of the knowledge and skills we teach them in school, and this text did not disappoint.

The book reads much like a Sherlock Holmes case file. Donald W. Olson describes how he and his team from Texas State examined paintings, battles, photographs, and literature through an astronomical lens, to locate, re(examine) and challenge their understandings of the works, as well as the conclusions of other researchers. Clues, such as historical documents (e.g., letters, train schedules, tide tables, newspaper clippings) are combined with modern means (e.g., computer planetarium simulations), to build their own portrait, which includes information about the astronomy, as well as the artists themselves.

Broken into four parts — *Astronomy in Art*, *Astronomy in History*, *Astronomy in Literature*, *The Terrestrial Sleuth* — Olson begins each chapter outlining the questions he and his team had set out to solve. In Part One, the challenge was often to deduce the location and date for a painting. Olson works with an underlying assumption that the artist included an accurate representation of what was present in the night sky from their location. From this, he uses stories about the artists and other references to the work, to deduce his answers. Olson also includes in this section an examination of *Times Square Kiss* — and specifically the shadows on the buildings — to add more information to the ongoing discussion on the as-yet

unidentified woman and sailor. In Part Two, the team sought to better understand the factors which influenced strategic battle preparations (such as the case for the Battle of Stirling Bridge or the Battle of Normandy), and worked with data to highlight misconceptions. Part Three focuses on literary passages, to determine their accuracy, in terms of celestial movements and season. Olson uses knowledge of each author's astronomical competence to frame the possible legitimacy of the passages, and then move on to determine whether authors had accurately described astronomical events or celestial movements based on the season or location of a scene. In the final part, Olson turns to two final puzzles: a railway and locating the Millais oak tree.

This is the second *Celestial Sleuth* book, and Olson makes reference to other case files in that volume — although not required to understand what is discussed here. The background knowledge required to understand the text is at the secondary level, and new material and terminology is explained succinctly to allow the reader to follow key ideas of analyses. For me, I felt it did provide some interesting options from which to teach physics at the secondary level, such as Chaucer's description of the moon's path in terms of Kepler's Laws of motion. For the higher education educator, I feel the book gives enough information to provide a roadmap of the kinds of information and tools one would need to endeavor on a similar quest.

Tasha Richardson,  
Teacher, Albert Campbell CI, Toronto District  
School Board

**ON GRAVITY—A BRIEF TOUR OF A WEIGHTY SUBJECT**, by Anthony Zee, Princeton University Press, 2018, ISBN: 9780691174389, price 19.95.

In the preface, Anthony Zee tells his readers that **On Gravity** is supposed to bridge the gap between popular books and textbooks on Einstein gravity. After reading the 142 pages of the main text and the eight-page appendix, I am convinced that he succeeded. The area between popular books and textbooks is somewhat of a no man's land, and especially for individuals with an interest in a particular field (say, gravity, for instance) this can be quite frustrating. What should you read when you already understand the basic idea of gravitation, know the main players in the history of its development, and have perhaps watched a few documentaries on the topic as well?

Well, you should read **On Gravity**.

The book is divided in four parts which consist of a handful of chapters each, and each chapter is again split into digestible sections with fitting and sometimes tongue-in-cheek headlines. Zee is one of the few physics authors who write so fluently and seemingly effortlessly that I didn't even realize I was already halfway through the book. His tone, as usual, is relaxed, conversational, and laid-back, making the seemingly complicated topic of Einstein's General Theory of Relativity a lot more approachable.

In part I, Zee introduces gravity as the weakest of the four fundamental forces in our Universe and explains the nature of electromagnetic (and gravitational) waves. In part II we learn about Einstein's main idea: the principle of relativity. We also learn why we shouldn't call it "principle of relativity." Part III is devoted to a detailed explanation of the action principle in both classical mechanics and gravity theory. Finally, in part IV we learn about black holes, Hawking radiation, gravitons, as well as the concepts of dark matter and dark energy. In the grand finale Zee highlights the importance of gravitational