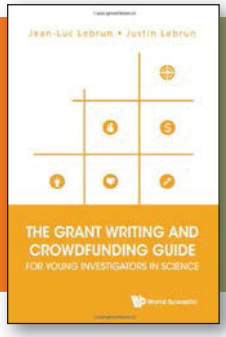
Chapter 7 offers a peek at energy supplies and focuses on technologies that can reduce carbon dioxide emissions or limit global temperature rise. Chapter 8 discusses the synthesis of a variety of materials, such as rare earths, ultrapure materials, size-controlled powders, thin films, and DNA. Chapter 9 puts a spotlight on disruptive materials technologies, including gene editing, ceramic superconductors, three-dimensional (3D) printing, graphene, and metamaterials.

Chapter 10 touches upon the role of microstructure in determining materials properties; chapter 11 covers intellectual property; and chapter 12 mentions the materials associated with commonly used products. Chapter 13 hints that protein-based materials may come to define the 21st century. It concludes with a cautionary note regarding optimistic claims about the potential application of novel materials, such as ceramic superconductors and graphene, or processes, such as 3D printing. A list of references is included at the end of each chapter.

The author has included as much popular materials science as possible in the short chapters. The narrative feels disjointed as it jumps across a dizzying array of topics. A given chapter may cover van der Waals forces, biodegradable polymers, cotton candy, silicon chips, stevia-based sweeteners, and radioactive fission products. Equations and formulas are kept to a bare minimum, and there is a paucity of graphics in the chapters.

The glossary is the strength of this book. Entries in the glossary introduce topics in lay terms and present references that the reader can use for further exploration. Unusual topics, such as artificial nails, electronic ink, faded jeans, hairy adhesives, iridescent organisms, patent trolls, stain-resistant clothing, and wound dressing, are covered. Overall, this book is a useful reference volume for anyone curious about materials science and engineering.

***Reviewer: Ram Devanathan**, Technical Group Manager in the Energy and Environment Directorate at Pacific Northwest National Laboratory, USA.*



The Grant Writing and Crowdfunding Guide for Young Investigators in Science

Jean-Luc Lebrun and Justin Lebrun
World Scientific, 2017
240 pages, $58.00
(softcover $28.00, e-book $22.00)
ISBN 978-981-3223-23-3

The primary aim of this book is to shine some light on the grant writing and review processes, but it also provides some insights on how scientists can use crowdfunding to support research efforts. The authors base their commentary on conversations they held with senior investigators and grant administrators, most of whom live and work in Asia.

The authors provide an abridged version of typical advice that new faculty are given by senior colleagues, but it stops short of providing meaningful insights into specific funding agencies that are regularly targeted by researchers in North America or elsewhere. As a result, most of the advice in the book lacks the highly tailored understanding of grants that can be gained by attending an agency-centric grant-writing workshop.

After a short chapter on finding the right grant for which to apply, the authors provide insights on "the first steps" for investigators. Suggestions include: work on a proof of concept, build a track record in publications, become a grant reviewer, and seek mentors who have experience in writing grants. The third chapter provides a list of considerations to be mindful of when offered the opportunity to write a collaborative grant. Chapter 4, perhaps the best chapter in the book, provides a brief but valuable service by explaining some of the vocabulary used in the world of grants.

The book then turns its attention toward different sections of the written document and the purpose of each. Chapters 5–9 are devoted to individual components of the grant, namely, the title, abstract, specific aims, budget, and significance of the work. Each of these chapters provides imaginary examples and exercises to help the reader think through the craft behind each section. Chapter 10 looks at the value and pitfalls of innovation, while chapter 12 discusses the various types of risks associated with grants and grant writing. Chapters 11 and 13 discuss the actual grant review process and how to deal with having your grant rejected. The final chapter briefly explains crowdfunding for scientific research purposes.

This book includes many of the typical soundbites of advice that a new professor should hear within or prior to the first year. However, what this book covers in breadth, it often lacks in depth. Many ideas are limited to a page or less. Furthermore, by focusing on a global audience from across the sciences, there is little discussion on specific funding agencies that new professors in materials science, chemistry, engineering, physics, and related disciplines would be interested in targeting.

The authors use a diverse set of fonts and include some commentary in the page margins, which result in a distracted reading experience. For future investigators who are looking for that first academic position, this book can serve as a simple introduction to the grant writing process, but it should not be the only resource that investigators rely upon when writing a first grant or when turning to a crowdfunding website for the first time.

***Reviewer: Anthony Stender**, assistant professor of analytical chemistry at Ohio University, USA.*