

BOOK REVIEWS

Astrobiology: Science, Ethics, and Public Policy, edited by Octavio Chon Torres, Ted Peters, Joseph Seckbach, and Richard Gordon (Hoboken, John Wiley and Sons, 2021). Pages xx + 424. ISBN 978-1119711162 (hardback). 152 × 229 mm. US\$195.

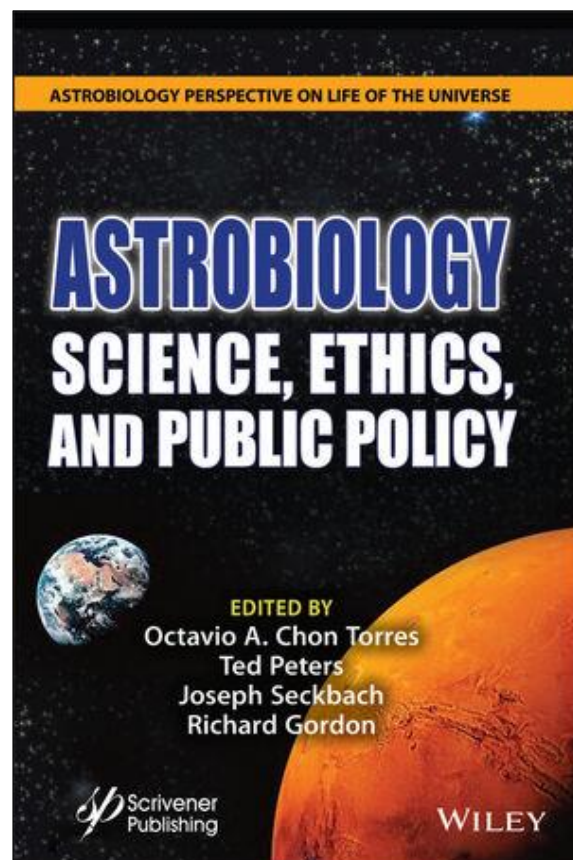
Extraterrestrial Intelligence: Academic and Societal Implications, edited by Jensine Andresen and Octavio A. Chon Torres (Newcastle Upon Tyne, Cambridge Scholars Publishing, 2022). Pages xxiii + 330. ISBN 978-1-5275-7727-5 (hardback). 145 × 210mm. US\$84.

More than other areas of astronomy, the science of astrobiology raises numerous ethical questions in its search for life in the Universe. Does Mars belong to the Martians, even if the Martians are only microbes? What do we say in response to an alien message, and who speaks for Earth? And should we initiate messages with possible extraterrestrials, revealing our location, when we

ion of space. Situated in Wiley's series on "Astrobiology Perspectives on Life in the Universe," it is part of a laudable and growing series of works on the societal impact of astrobiology, wherein theologians, humanities and social science scholars address the implications of finding life—especially intelligent life—beyond Earth (Dick, 2018a). There is even a Society for Social and Conceptual Issues in Astrobiology (Smith and Mariscal, 2019), and ten years ago NASA began funding the Baruch S. Blumberg NASA/Library of Congress Chair in Astrobiology specifically to study humanistic aspects of the subject (Library of Congress, 2022). The search for such life has been a Holy Grail of astronomy over centuries (Crowe, 1986; Dick, 1982; 1996; Guthke, 1990), and thus a valid subject for historians of astronomy interested in science attempting to function at its limits on a question of profound import.

Lest readers of this journal think astrobioethics is a rather far-out subject, that it is a recognizable subdiscipline is not only evident in the works cited above and many others (e.g. Dick, 2019; Impey, 2013), but also in institutional settings; the International Association for Geoethics, for example, has a working group on the subject, and NASA's Astrobiology Strategy (Hays, 2015) recognizes the subject in the same way that other science projects such as the Human Genome Project have Ethical, Legal, and Social Impact (ELSI) components. Legal, ethical, and social aspects are the three fundamental axes for astrobioethics also, with this volume focusing on the ethical aspects. The subject is now made more urgent by the discovery that virtually every star has planets (5,000 confirmed at last count), some Earth-sized and in their star's habitable zone, and by the fact that with the discovery of extremophiles on Earth the limits of life are known to be much broader than once thought (Kolb, 2019; Lingam and Loeb, 2021).

The lead editor of this volume, a Professor of Philosophy in the Program of Liberal Studies at the Universidad de Lima and a leader of the Peruvian Association for Astrobiology, lays out three broad areas of concern in his opening chapter: epistemological, astrotheological, and interplanetary. The epistemological problem overarching all others is that we only have one example of an ethical system: our own. We can imagine what our ethical response might be to finding microbial life, but not until we find intelligent life can we begin to have a true astrobiocentric ethic, which some have called a cosmocentric ethic (Lupisella, 2020). Astrotheology refers broadly to finding meaning in the Universe, whether through modifying current religions, or



know nothing about *their* ethics, which could range from altruistic to destructive? *Astrobiology*, the first volume under review, addresses astroethics, or astrobioethics, as some prefer to call it in order to distinguish the moral implications of the search for life in the Universe from other space exploration ethical issues such as terraforming, resource utilization, and the militarizat-

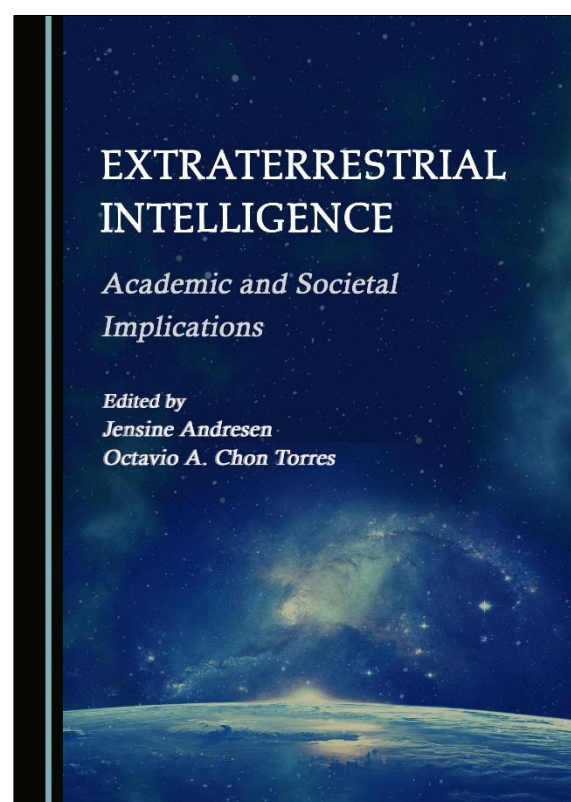
inventing new ways of finding meaning through cosmic religions such as cosmotheology. This aspect has also been the subject of much recent activity (Claremont School of Theology, 2022; Dick, 2018b; Peters, 2018). The interplanetary issue deals with planetary protection, both of Earth and other planets, a problem that NASA and other space agencies have grappled with since space exploration began (Melzer, 2011). Many of the problems here center around the concept of intrinsic versus instrumental value. These three broad areas—epistemological, astrotheological, and interplanetary—are actually not sufficient to cover all the areas of astroethics even in this book, such as the interstellar endeavor of the Search for Extraterrestrial Intelligence (SETI) and Messaging Extraterrestrial Intelligence (METI).

The remainder of the 18 chapters in the volume elaborate on these themes and others, including contamination of other planets and back contamination of Earth (Milligan, Billings, Persson), the humanistic problems of SETI and METI (Haramia and DeMarines, Crawford, Rappaport and colleagues), and even space settlement (Greenall-Sharp et al.). The authors include theologians (Ted Peters, Chris Corbally), ethicists (Jacques Arnould), philosophers (Chelsea Haramia, Tony Milligan, Kelly Smith, Chon Torres), astronomers (Chris Impey), astrobiologists (Julia DeMarines, Julian Chela-Flores) and others. The scope is broad and the issues too many to discuss in this review. The bottom line for many of the authors, even the theologians, is that we need to develop a truly astroethical approach to deal with these issues, as opposed to the anthropocentric approach we now have. Suffice to say readers will find this a stimulating volume that expands the mind in many directions.

The outlier in this book is the chapter by Jensine Andresen, an independent scholar with excellent credentials including Princeton, Columbia, and Harvard, who argues that the U.S. Government knows that UFOs "... are real and most likely are of extraterrestrial origin." (page 193). She characterizes this idea, and its possible use as a pretext to rationalize the militarization of space, as two 'elephants in the room' of astrobiology. Her reasoning seems to me highly dubious, and this leads us to the second volume under review, for which she is the lead editor and Chon Torres the second editor. By contrast with the *Astrobiology* book, the *Extraterrestrial Intelligence* volume edited by Andresen and Chon Torres is provocative, curious, and at times strange. On the one hand it fits into the theme of the societal implications of finding extraterrestrial life. On the other hand, it focuses on the most extreme and controversial possibility—not only

that extraterrestrials are out there in space, but that they are already here on Earth. Fully six of the 18 chapters deal explicitly with Unidentified Aerial Phenomena (UAPs), the new buzz words for what were formerly called Unidentified Flying Objects (UFOs). Many of the other chapters deal with them tangentially, so the subject is obviously meant to be a central theme of the book.

What are we to make of this? The extraterrestrial hypothesis (ETH) of UFOs and claims of alien abductions have a long and checkered history in popular culture and among some scientists and scholars such as J. Allen Hynek, John Mack, and Peter Sturrock (Achenbach, 1999; Eghigian, 2014; Jacobs, 1975; Peebles, 1994). I well recall being taken to task by high-



profile people including Apollo 14 astronaut Edgar Mitchell when I failed to include UFOs in the Library of Congress Symposium "Preparing for the Discovery of Life Beyond Earth" held in 2014 (Dick, 2015; Mitchell, 2014). That symposium analyzed the implications of success in mainstream astrobiology and SETI, the latter of which has focused on possible radio or optical transmissions from technical civilizations hundreds or thousands of light years away using standard astronomical techniques. It is true that alien interstellar travel to Earth is a logical possibility. But it is a possibility that most scientists believe lacks robust evidence. Recent revelations of U.S. military involvement in data-collection, Congressional hearings on UAPs, and even official NASA involvement, has brought the subject to

the forefront ([U.S. House of Representatives, 2022](#)). But in the end this debate always comes down to a single word: evidence. And whatever else they may be, in my view the evidence for UAPs as alien spacecraft, the so-called extraterrestrial hypothesis, falls far short.

This volume is not primarily about examining such evidence, but about the implications if extraterrestrial life is found near or on Earth. The authors include three well-known astronomers (including Harvard's Avi Loeb and again the University of Arizona's Chris Impey), two philosophers, three theologians, and six independent scholars—the latter not to be disparaged since many have advanced science degrees, and those of us retired fall into the same category. The book is not the product of a meeting, but of authors solicited and chosen based on their expertise and interest. They represent a variety of views along a spectrum ranging from skeptical to agnostic to true believers in UAPs as extraterrestrial spacecraft. Among the latter is Andersen, who in the opening chapter argues we need to determine the possible academic and societal impact should extraterrestrial intelligence be discovered. So far, so good, but then she states that in order to do this we need to stop and "... consider just how advanced the ETI in our midst right now actually is." Her lengthy closing chapter is even more explicit where she states her belief that "... many UAP are in fact extra-terrestrial in origin." She cites

... considerable historical evidence and analysis ... [and argues that] In addition, tens of millions of people have witnessed UAP, which also have been documented in photographs, on video, and with radar. My view that many UAP are in fact extraterrestrial in origin is supported further by plausible interpretations of various petroglyphs, geoglyphs, and artifacts, and by accounts described in the literature of many cultures extending back thousands of years. (page 281).

This treads dangerously close to debunked ancient astronaut theories by such people as Erich von Däniken, long discounted by serious scholars. And as far as UAPs in the skies, it seems telling to me that in these days when everyone has a cell phone camera, all we still have are blurry pictures. U.S. Navy radar images indicate an interesting phenomenon that needs to be studied, but are not definitive, certainly not for the extraterrestrial hypothesis.

Most of the authors in this volume do not exhibit such far-out ideas and fall somewhere along the spectrum of skeptical to true believer. Astronomer Chris Impey is unambiguously agnostic for the same reason I am. While he thinks it likely that extraterrestrials exist beyond Earth and keeps an open mind about UAPs, he keeps "...

coming back to the primacy, and the paucity, of physical evidence." (page 27). To him the idea of UAPs interpreted as alien spacecraft is "... a multi-layered hypothetical with unknown probability attached." (page 29). In his lengthy 46-page essay Harvard astronomer Avi Loeb takes a broader view and advocates fresh approaches to SETI, including UAPs. To this end this former Chair of the Harvard Astronomy Department has co-founded the Galileo Project at Harvard to "... conduct a scientifically controlled series of experiments using appropriately tailored instrumentation ..." to collect data, not only for UAPs but also for other anomalous phenomena such as the interstellar asteroid Oumuamua. Loeb has famously written an entire book on this interesting object, proposing that it could be an interstellar light sail due to unusual characteristics such as unexplained acceleration ([Loeb, 2021](#)). He has not convinced many of his astronomical colleagues, but his chapter is an interesting attempt to balance open-mindedness with scientific rigor. Between the far ends of the spectrum of Impey on the one hand and Jensine on the other, the book displays a variety of other positions, not analyzing the data but looking at the social implications. Impey opines:

Carbon chemistry and the second law of thermodynamics may well be universal, but what are the extraterrestrial analogs to Mozart and Shakespeare? (page 28–29).

Such questions open new vistas for the humanities, and for humanity. 'Universal history' may be more worthy of the name if and when we make contact.

In my view UAPs are a phenomenon to be studied, especially for those 3% or so that remain a mystery. But with the evidence we have, it seems to me they are far more likely to be physical phenomena we do not understand, or more sinisterly a national security risk originating with other countries, rather than extraterrestrial spacecraft. We must remain open to the latter, but in studying UAPs we should remember the statement commonly attributed to Nobel Prize physicist Richard Feynman that "... we should keep an open mind, but not so open that our brains fall out." Most of the essays in this volume follow this dictum, although some occasionally step over the line.

Whatever the outcome, the debate will have been worth it if it makes us think about our knowledge and academic biases in a more generalized way—in other words from an extraterrestrial perspective. At the same time we may join Chris Impey and ask the psychological/sociological question: "Why are we so lonely?"

Books such as these on the societal impact of astronomy may be considered part of the

philosophy of astronomy, which I have argued should be part of the history of astronomy's expanded portfolio (Dick, 2020a), just as the broader history and philosophy of science have formed a fruitful symbiotic bond. Although classical history of astronomy will rightly remain a central focus for most practitioners, historians of astronomy should not shy away from studying and critiquing the many issues in the history of space exploration and their implications, and engaging with the community of scholars whose central focus is the modern era and its astonishing revelations about the Universe and our place in it.

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***The Sky Is for Everyone: Women Astronomers in Their Own Words*, edited by Virginia Trimble and David A. Weintraub. (Princeton, Princeton University Press, 2022). Pp. xxvi + 472. ISBN 978-0691207100 (hardcover), 150 × 230 mm, US\$29.94.**

Many of the books reviewed in the pages of the *Journal of Astronomical History and Heritage* are biographical in nature, detailed accounts of the lives and careers of individuals long gone. In *The Sky Is for Everyone* we find thirty-seven brief autobiographies of modern astronomers, all female and very nearly all still with us.

These are not the pioneering women one meets in an introductory astronomy class (Annie Cannon, Henrietta Leavitt, etc.), although we do encounter them in a thirty-page prelude titled “Beginnings”. This concise history of women in astronomy begins with Dorothea Klumpke earn-