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Books in Review

Barry B. Luokkala
Exploring Science Through Science Fiction
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Reviewed by **Jen Jenkins**

As the title suggests, Barry B. Luokkala's *Exploring Science Through Science Fiction* offers a wide-ranging treatment of fundamental scientific questions and concepts as dramatized in science fiction. Designed for an undergraduate science course, this textbook addresses the varying degree of plausibility inherent to many popular science fiction constructs, from time travel to jet boots, and ranks them as currently possible, theoretically possible given further technological advancement, or likely impossible. Each chapter serves as a focal point for larger theoretical questions, including: the nature of space, time, and the universe; the probability of advanced technology like self-aware AI; and the responsibilities inherent to "good" science. By tapping into the popularity of science fiction stories, Luokkala aims to "make science accessible to a broad audience" (vii), igniting interest and providing clear guidance without sacrificing complexity. This journey from science fiction to science fact provides an engaging and surprisingly approachable read, exploring scientific theory and enlightening the nontechnical reader, although the brevity and sheer variety of examples necessarily prevents a deeper engagement with some of the technical concepts.

The opening and closing chapters provide an effective framework, establishing current theories and finishing with a call to greater possibilities within the future of science, offering the rapid advancement of the last few decades as proof of fantastical things to come. This context orients the nontechnical reader, providing a compass for a potentially alien landscape, thus converting anxiety of the unknown into excitement over the undiscovered. Subsequent chapters tackle major theoretical concepts in brief, digestible portions, offering practical problems and discussion to facilitate a grounded, practice-based understanding of how scientific theory works.

For example, chapter three asks "What is the universe made of?," using the fictional concept of a "baryon sweep" from an episode of *Star Trek: The Next Generation* to launch a discussion of large-scale physics and quantum mechanics. The conversation moves through models of particle physics, the makeup of atomic nuclei, the varying states of matter, and how matter transitions via energy – the latter culminating in an estimation problem which calculates the energy requirement needed to vaporize Jean Luc Picard by phaser blast – before transitioning into exploration topics and suggestions for further reading. Luokkala not only successfully explains a highly technical abstract concept, but keeps the discussion grounded in something tangible. The account of *Star Trek*'s technobabble offers a fun, engaging access point into the world of quarks and leptons, how we define them, and how their definitions have evolved over time.

While this approach effectively introduces the concepts that carry through the rest of the chapter, each subchapter also offers several other science fiction tie-ins from varying sources. Luokkala logically presents these examples based on their applicability to the concept under discussion, but the sheer variance between sources and situations can distract the reader, forcing the occasional pause to verify in which fictional universe a particular example can be found

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as the text moves quickly from one concept to the next. From a technical perspective, the linkage between concepts and their examples makes perfect sense, but for the nontechnical reader – the desired audience – the transitions can sometimes be jarring. For example, Luokkala discusses the nature of matter in several related sections, one detailing transparent solids in *Star Trek IV*, while the second moves into camouflage via the James Bond film *Die Another Day* and creatures in *Predator*. From there, stealth and cloaking technology comprise a third section which uses a different Bond film and Harry Potter's invisibility cloak as examples, with all three sections covered in the span of four pages. The brevity involved in making so many scenarios work in limited space leaves behind a desire for more information – even for something as simple as estimating the number of micro cameras needed to camouflage James Bond's car. However, the examples clearly relate to each concept, and offer understandable answers to questions regarding the nature of universe within the limits of known science.

Each subsequent chapter engages in a similar mode of discussion, tackling a plethora of scientific topics with plenty of nods toward popular questions science fiction aficionados have long debated – is the truth really out there? What does it mean to be human? – while packing in a wealth of information and theory into its scant 200 pages. A robust index offers guidance for the reader who needs information on a particular topic or episode, while the appendices include another forty well-organized pages of starting points, further reading, episode watching, and practice equation solutions. Although the book contains far more content than coverable in a single semester, the modular format of each chapter allows instructors to choose the material that fits their course structure without losing organizational flow, offering a compact, flexible approach to general education science courses. On the whole, *Exploring Science through Science Fiction* strikes a delicate compromise, introducing readers to the fantastical side of science without being completely overwhelming.