Astrophysics for People in a Hurry by Neil de Grasse Tyson is an explanation of the work of astrophysicists and astronomers. The book is intended for audiences who are curious about the nature of astrophysics and astronomy and who may not have the technical knowledge of the nature of the work.

In the book, the author clearly intends to acknowledge the entirety of the tenets of the Nature of Science and Math as they apply to the studies of the universe. Among them, the author masterfully elevates for his audience: A) Scientific Investigations Use a Variety of Methods (and Tools); B) Scientific Knowledge is Based on Empirical Evidence; and C) Scientific Knowledge Assumes and Order and Consistency in Natural Systems.

Scientific Investigations Use a Variety of Methods (and Tools) *and* (consequently) Scientific Knowledge is Based on Empirical Evidence

Dr. Tyson uses several examples of investigations throughout his book to promote the importance of the tenets of Scientific Investigations Use a Variety of Methods (and Tools). He chronicles the evolution of astronomical investigations from the direct visual observations which were made by Nicolas Copernicus and are currently being made by the Hubble Space Telescope, through the mathematical calculations of detectable and undetectable inherencies developed by Sir Isaac Newton and Albert Einstein, to the observations of quasars, hydrogen clouds, and dwarf galaxies only detectable because of developments of observational technology and tools.

By explaining the methods through which astronomical observations are made, Dr. Tyson directly develops the consequential tenet Scientific Knowledge is Based on Empirical Evidence. He certainly intends to address erroneous claims made by "flat-Earthers" with empirical evidence. In chapter "8. On Being Round," he begins his defense of a spherical Earth by stating "(a)part from crystals and broken rocks, not much else in the cosmos comes with sharp angles" (134). This statement is obviously derived from a vast database of empirical visual observations. He goes on to support his examination with physical laws and forces such as surface tension, gravity, and centrifugal force, and proceeds to explain the nature of those laws and forces. He also gives examples of the natural formation of spheres in application, explaining how ball bearings are formed through undulation.

Scientific Knowledge Assumes and Order and Consistency in Natural Systems

Among the most interesting accounts Dr. Tyson makes in the book are the development of the rationalizations of the unobservable or undetectable through the Assumptions of Order and Consistency in Natural Systems. He illustrates this tenet by explaining Albert Einstein's "thought experiment" method, through which Einstein invented models and logically justified the consequences of physical principles in the universe. Einstein's theory of relativity was developed through his thought experiment model. Einstein outlined the mathematical details of the nature

of movement under the influence of gravity. By doing so, he accurately predicted gravitational waves, which were empirically observed in 2016 when astrophysicists developed a method to do so.

Einstein's theoretical observations of gravity were done so from absolute calculations, developed earlier by Sir Isaac Newton, which he adjusted to ensure higher accuracy. In his adjustments, Einstein included a term he called the "cosmological constant." After his cosmological constant was disproven by several scientists, including Edwin Hubble, Einstein declared it his "greatest blunder." However, in 1998, groups of astrophysicists observed particular phenomena of the behavior of distant supernovas, which they concluded could only occur under the premise of Einstein's "cosmological constant." This constant now has given rise to the theory of dark matter, undetectable yet seemingly obvious and influential on the nature of the constructs of movement and gravitational force. Because of the recent developments, Dr. Tyson whimsically declares, "Einstein's greatest blunder was having declared (cosmological constant) was his greatest blunder" (112).

Dr. Tyson's account of Einstein's cosmological constant also highlights the tenet Scientific Knowledge is Open to Revision in Light of New Evidence.

Conclusion

In his book, Dr. Tyson aims to reveal the natural wonders, observational phenomena, meticulous calculations, extraordinary tools, and enlightening explanations applicable to the studies of the universe. He directly addresses an audience, who may or may not possess the appropriate technical knowledge, and which has been captivated by the nature of the universe. He does so by framing his narrative and explanations using all of the tenets of the Nature of Science and Math, especially through the tenets of the methods, evidence, and constants which make the study of astrophysics absolute. Because of his attention to the tenets, this book is an exemplar for how to communicate technical scientific knowledge to the general public.

Reference

Tyson, N. d. (2017). Astrophysics for people in a hurry (First edition.). New York ; London: W.W. Norton & Company.