



Astronomical: From Quarks to Quasars: The Science of Space at its Strangest

Tim James

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When seeking to understand how the universe works, “we have to let go of instincts, intuitions and simple explanations,” science teacher Tim James writes. In *Astronomical*, he revels in the oddness of planetary behavior and quantum physics, using diagrams and stories to exemplify the problematic nature of space.

The scale of the cosmos—its age, its size—is hard to grasp. It would take the world’s fastest manned airplane five years to get to the sun; and all of the planets in the solar system are different and “weird,” in that they don’t do what people expect. Even scientists’ best theories, like the Big Bang, raise further questions: in that model, there should be three times as much lithium, and twice as much matter in general, on Earth as there is. “Our facts run out, our equations become shaky,” James acknowledges.

James breaks complex concepts down to the basics to make them intelligible: physics is about big stuff (relativity) versus small stuff (quantum mechanics); black holes, which are heavy but dimensionless, represent both. And popular culture is referenced to illustrate difficult ideas, as with the movie *Interstellar*, which features a black hole designed by physicists to reproduce the most accurate guess.

With a range of reader-friendly tactics, including “what if” questions and sketches featuring stick figures, this is an informal text that’s interspersed with accounts of ancient scientists, the Doppler shift for sound waves, and the myths surrounding Einstein’s hypotheses, with figures and tables that express data in visual form.

To tame the enormity of space into manageable floes of knowledge for general readerships, *Astronomical* address the strangeness of the universe with awe.

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