

Col 0

STARTING OUT: A Spark of Awe in the Darkness

Col 0

On October 9, 1604, a brilliant spark of light grew to life in the darkness of the night sky over Europe. A few days later, the astronomer Johannes Kepler began to gaze up at the new star that had appeared in the void, outshining all its peers, visible for a time even through the brightness of the day. Kepler wrote extensively on the astronomical properties of the new star, or *stella nova*, whose sudden appearance challenged the conventional wisdom that the heavens were fixed and unchanging [Kepler, [1604] 2004]. Over the ensuing months, the new star faded gradually back into the celestial background. Nothing similar has appeared in our skies to surpass it since then, even four centuries later.

Today's astronomers would have called Kepler's star a *supernova* and could have told him some astonishing details about the nature of the object that captured his attention on that clear night so long ago [FIGURE 1.1]. They could have told him about a star several times more massive than the Sun, reaching the end of a lifespan measured in eons, collapsing suddenly in upon itself to form a core blazing at a hundred billion degrees, then bursting outward again in a cataclysmic explosion that, for a time, shone brighter than the entire surrounding galaxy. The light of that distant explosion was obliged to sear through space to arrive tens of thousands of years later in the night sky over Europe, drawing Col 0 human eyes upward in wonder.

Yet a supernova, for all its magnificence and rarity, is still outshined

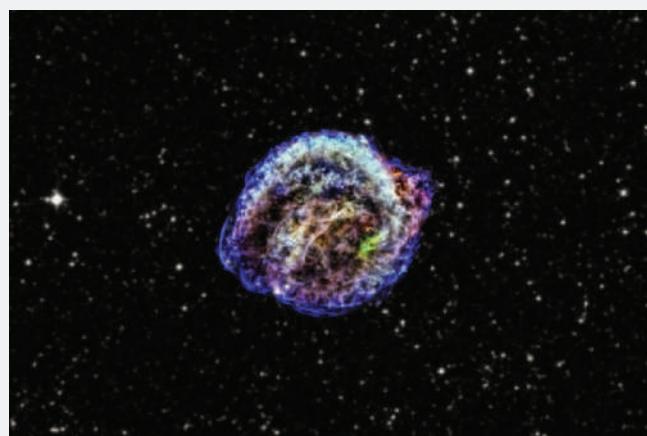


FIGURE 1.1 SN 1604, also known as Kepler's Supernova, as seen through NASA's Chandra X-ray Observatory in 2013. This massive stellar explosion was originally observed in 1604 by the astronomer Johannes Kepler. Supernovae of this type are rare and magnificent events: no similar explosion has been seen in our galaxy since Kepler's time, more than 400 years ago. Yet the human brain, a three-pound piece of universe capable of thought, perception, and feeling, is arguably more remarkable than anything it might chance to observe among the stars of the night sky.

Col 1

by marvels closer to home. As Kepler stood under the stars, beholding the bright spark in the darkness before his eyes, even rarer and more wondrous events were taking place in the darkness *behind* his eyes. In that mysterious vault within his skull, a spark, not of light but of awe, was taking form in the warm, dark passageways of his brain. Where the supernova burned with common light and heat, his mind burned with a rare and incandescent emotion. Where the supernova shed its light blindly in all directions, his mind turned its attention to one tiny facet of the universe beyond, striving to see more clearly. Where the supernova was unaware of its own grandeur, Kepler's mind was capable of reflecting on the curious mystery of its own existence.

Col 2

Take a three-pound piece of universe, arrange its atoms just so, into the knotty network of a human brain, and the resulting object develops remarkable properties. It is capable of *knowing* that it is a piece of the universe. It is capable of knowing of its own existence, capable of perceiving impressions of the other bits of universe around it, and capable of thrumming with internal feelings of awe, fear, joy, hatred, perplexity, and wonder. There is nothing else we know of, anywhere, that can do these things. Minds are inimitable, mysterious, and precious beyond measure. The very least of us, no matter what our failings or faults, by mere dint of being alive and aware, is more remarkable than any orb in the sky. This is what a mind is worth.