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## An Evaluation of Evidence for the Age of the Universe

A group of Christians professionally trained in astronomical research has reviewed presentations by Drs. Danny Faulkner and Hugh Ross, covering arguments on the age of the universe. We appreciated the civility and respect of the discourse on a topic often generating more heat than light within the Christian community. Our analysis concentrates on arguments made by the speakers dealing with astronomical data and calculations, rather than about Biblical interpretation or biological evolution, because the former are our areas of professional expertise. We do note that, for example, one's view of Scriptural interpretation and theology will affect the range of models one would consider.

Our aim has been to assess the evidence for the age of the universe in the light of the arguments presented, using a standard scientific approach. Science seeks to make progress in understanding the physical world through inductive reasoning, rather than the watertight proofs found in mathematics. This means that scientific understanding advances through an enormous amount of focused, incremental efforts with many consistency checks in the context of a mutually accountable scientific community. Drawing sound conclusions about a general question such as the age of the universe cannot be done on the basis of one argument alone but requires many different independent experiments including tests that could falsify competing claims. Any conclusions, along with an evaluation of their certainty, are then made on the basis of the overall weight of the available evidence. There will often be some data that appear to disagree with the rest of the evidence; this does not automatically provide evidence for alternative hypotheses but often means that our theoretical understanding is not yet entirely complete.

Ross's arguments provide solid evidence that the universe is billions of years old. He presents several independent arguments, based on a wide range of data, indicating that the universe and most objects in it are much older than ten thousand years. The light-travel-time argument is particularly strong in both its basis in physical principles and its simplicity. Faulkner does not present evidence for a universe thousands of years old but rather makes claims for isolated inconsistencies in the case for great age. While it is common scientific practice to look for holes in well-established theories, the new contrary evidence must either be very strong to counter the existing evidence for the theory or else be supported by a new theory that readily explains both the new evidence and the old. We judge that the "inconsistencies" pointed out by Faulkner do not meet either of these criteria. In some instances the observations are completely consistent with our current understanding of these physical systems in the context of an old universe; in others, while universally accepted interpretations don't exist today and our knowledge is often still incomplete, such explanations are likely to be forthcoming as observations and theory progress. It is our professional judgment that the weight of the evidence overwhelmingly supports a universe that is billions of years old.

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