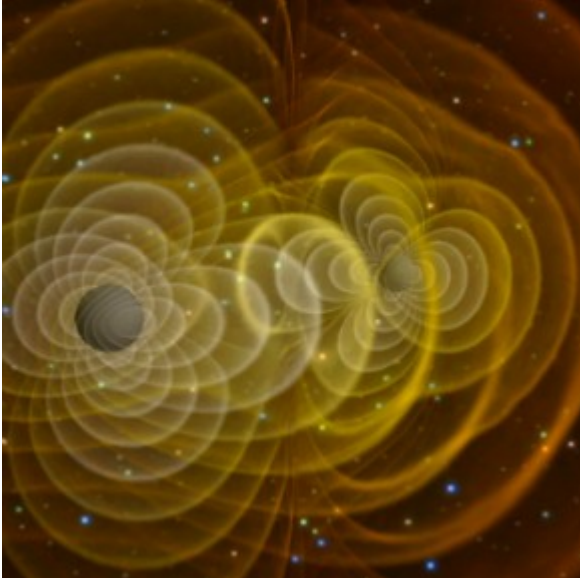


## Beyond the heavens

From the Editors in the [March 16, 2016](#) issue



Researchers used the Columbia supercomputer at the NASA Ames Research Center to create a three-dimensional simulation of merging black holes. [Public domain image](#) by Henze, NASA.

The scientifically minded and the scientifically challenged both paused last month to contemplate the far reaches of the cosmos. Scientists at the Advanced Laser Interferometer Gravitational-Wave Observatory reported that they had detected gravitational waves emanating from the collision of two black holes—places of such heavy gravity that even light cannot escape. These waves, generated a billion light-years away, had the effect of altering, if infinitesimally, earth's space-time continuum. The discovery was the result of a century of collaborative research that began with Albert Einstein and, in recent years, drew on \$0.5 billion in U.S. government funding.

Almost as staggering as thinking about a gravitational event in an unimaginably distant part of the cosmos is the scientific capacity to postulate its existence and verify its occurrence. Observatories 1,900 miles apart in Louisiana and Washington were able to record the different arrival times of the gravitational waves and thereby locate their source.

Einstein remarked that “the most incomprehensible thing about the universe is that it is comprehensible.” The universe discloses itself by way of physical theorems and mathematical formulas. In some fashion, the universe wishes to be known; it allows a creature that is part of that very universe to learn some of its language.

Should half a billion dollars be spent on pure research of little apparent practical value? One response to that reasonable query is that pure research tends to lead eventually to practical benefits. Another is that compared to the \$600 billion spent yearly on the U.S. defense budget, half a billion dollars spent looking for clues to the structure of the cosmos is a deeply humane endeavor.

In Psalm 8, the first of the psalms celebrating creation, the writer begins by praising God, whose fingers made the moon and stars and whose glory is even “above the heavens.” Immediately after celebrating the magnificence of the cosmos, the writer goes on to marvel at the place humans have in creation. Humans are tiny compared to the cosmos, but our capacity to make sense of the cosmos is also marvelous, a source of our peculiar dignity. “You have made them a little lower than God.” And with that position comes the responsibility of stewardship—and praise.

Theologically, the primary marvel of the universe is not how the world is but that it is. Nevertheless, to explore how the world is—in the patient, rigorous, and collaborative way that physicists and astronomers work—is a way of celebrating it. In their own way, research scientists are affirming the ancient words: “O Lord, how majestic is your name in all the earth.”