

# Ralph Alpher, 86, Expert in Work on the Big Bang, Dies

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Ralph Alpher, a physicist whose early calculations and theoretical predictions supported the Big Bang concept for the origin of the universe, though his role was largely overlooked as later discoveries proved him right, died last Sunday in Austin, Tex. He was 86.

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Union College, 1999

Ralph Alpher

His death was announced by Union College in Schenectady, N.Y., where he was a professor emeritus. The announcement said he had been living in Austin and been in failing health since breaking his hip in February.

Only last month, Dr. Alpher was awarded the National Medal of Science at a White House ceremony where he was cited for “his unprecedented work” on the origin of cosmic particles, “for his prediction that universe expansion leaves behind background radiation and for providing the model for the Big Bang theory.”

It was the science establishment’s last effort to make amends to a “forgotten father of the Big Bang” for the failure to recognize fully and earlier Dr. Alpher’s role in the theory’s foundations. He was unable to accept the award in person.

When he was a graduate student at [George Washington University](#) in the 1940s, some scientists had for about two decades hypothesized that the universe had begun in an

explosion of condensed matter and had been expanding ever since. But some still favored the steady-state theory, which held that the universe had always existed in more or less its current state.

In 1948, Dr. Alpher published two papers based on research for his doctoral dissertation. The first was written with his adviser, George Gamow, a Russian-born physicist with a puckish turn of mind who obtained permission to include as a co-author Hans Bethe, an authority on the origin of cosmic elements. The authorship by Alpher, Bethe and Gamow was a scientific pun on the first letters of the Greek alphabet, which seemed appropriate for a paper on cosmic genesis.

The paper reported Dr. Alpher's calculations on how, as the initial universe cooled, the remaining particles combined to form all the chemical elements in the world. This elemental radiation and matter he dubbed ylem, for the Greek term defining the chaos out of which the world was born.

The research also offered an explanation for the varying abundances of the known elements. It yielded the estimate that there should be 10 atoms of hydrogen for every one atom of helium in the universe, as astronomers have observed.

Months later, Dr. Alpher collaborated with Robert Herman of the Applied Physics Laboratory at [Johns Hopkins University](#) on a paper predicting that the explosive moment of creation would have released radiation that should still be echoing through space as radio waves. Astronomers, perhaps thinking it impossible to detect any residual radiation or still doubting the Big Bang theory, did not bother to search.

Then, in 1964, the radio astronomers Arno Penzias and [Robert Wilson](#) of Bell Telephone Laboratories in New Jersey accidentally detected the hiss of background radiation. Astrophysicists at [Princeton University](#) proposed that this was the radio echo from the Big Bang, which they had independently predicted and been looking for.

Dr. Alpher and Dr. Herman had been vindicated, except that no one involved in the discovery so much as tipped a hat in their direction. Belatedly, scientists have acknowledged the slight.

In his authoritative 1977 book, "The First Three Minutes," Steven Weinberg, a Nobel laureate physicist at the [University of Texas](#), described Dr. Alpher's research as "the first thoroughly modern analysis of the early history of the universe."

Dr. Weinberg said in an e-mail message that the calculations by Dr. Alpher and Dr. Herman "had for the first time given an idea of the temperature of radiation left over from the early universe." But, he added, "what is strange is that Alpher and Herman did not push radio astronomers to look for this radiation."

While Dr. Penzias and Dr. Wilson later received [Nobel Prizes](#), Dr. Alpher and Dr. Herman soon dropped out of cosmology and were later seldom credited for their

contribution. Dr. Alpher joined the General Electric Research and Development Center in Schenectady in 1955 and became a research professor of physics at Union College in 1986, retiring in 2004.

Ralph Asher Alpher was born in Washington. The [Massachusetts Institute of Technology](#) offered him a full scholarship, but after he disclosed that he was Jewish, he said, the scholarship was withdrawn without explanation. Instead, he attended George Washington University at nights while working at the Naval Ordnance Laboratory in Washington and at the Johns Hopkins physics laboratory.

Dr. Alpher is survived by a son, Victor, of Austin; a daughter, Harriet Lebetkin of Danbury, Conn.; and two granddaughters. His wife, the former Louise Simons, died in 2004.

In a 1999 article in Discover magazine, Dr. Alpher spoke of the ache of being the forgotten man of Big Bang science.

“Was I hurt?” he said. “Yes! How the hell did they think I’d feel? I was miffed at the time that they’d never even invited us down to see the damned radiotelescope. It was silly to be annoyed, but I was.”