

In Memoriam: 1915-2015, Charles Hard Townes, outstanding scientist and international spokesperson for the convergence of science and religion

Charles Hard Townes was born in Greenville, South Carolina, July 28, 1915. At 19 he graduated from Furman University *summa cum laude* with majors in physics and modern languages. After a Masters degree at Duke University he completed his Ph. D. in physics at the California Institute of Technology in 1939. Following several years at Bell Labs he joined the physics department at Columbia University. There in 1951 he conceived the idea of a “maser” (an acronym for “microwave amplification by stimulated emission of radiation”), a device which triggers the release of coherent light from highly energized ammonia molecules. By 1958 he and Arthur Schawlow had extended this research to include visible light in what is now one of the most famous and ubiquitous denizens of the technological world, the “laser.” After serving as Provost of the Massachusetts Institute of Technology he was appointed University Professor at the University of California, Berkeley, in 1967, where he worked until his death on January 27, 2015. Throughout his career and continuing into his late 90s Charlie’s personal work ethic included six days a week and most evenings at the lab; Sundays were reserved for church, friends and family. He received the Nobel Prize in 1964, the Templeton Prize in 2005, and along with dozens of other prestigious prizes and honorary doctorates he was a Fellow of the National Academy of Sciences, a Fellow of the American Academy of Arts and Sciences, and he received the National Medal of Science in 1982.

So much more can be said in tribute to this extraordinary scientist. Yet it is extremely rare for even a distinguished scientist like Charlie Townes, with a list of accolades a football field long, to accomplish something that changes the course of civilization. Yet Charlie has done so with the discovery of the maser and, especially, the laser. From cd-players and bar-code scanners to cataract and cancer surgery and dentistry without anesthetics, from national missile defense and controlled nuclear fusion to optical fibers and lunar laser ranging, from laser desk-top printers to multimedia laser light shows, from identity holograms on credit cards to floating navigational holograms used by airplane pilots, the laser has forever changed the landscape of our technological world.¹

But what is of even greater importance for those of us committed to the responsible dialogue between religion and science is that for all the decades of his scientific research Charlie has been a champion of the intellectual validity and ethical voice of religion to an often skeptical and occasionally dismissive scientific community. Charlie has been unremittingly outspoken in his conviction that science and religion are “convergent”, to use his favorite word for their relationship, rather than conflictive or isolated realms. He first wrote about science and religion in a now-famous 1966 article in the MIT journal *THINK* titled “the convergence of science and religion.” He spelled out the structure of this convergence in “Spiritual Views from a Scientific Base,” a key

¹ See http://en.wikipedia.org/wiki/List_of_laser_applications

chapter in his 1995 autobiography, *Making Waves* (American Institute of Physics publication).

According to Charlie, convergence is possible because science and religion share four factors in common: 1) The role of faith. “Faith is essential to science... Faith is necessary for the scientist to even get started, and deep faith necessary ... to carry out ... tougher tasks.” 2) The role of revelation. Instead of the popular view of the scientific method as strictly deduction from raw data to a complete theory, Charlie argues that scientific discovery requires insight, which like religious inspiration is laced with intuition, accident, and the joy of a “wonderful idea.” 3) The problem of proof. In science we can disprove our theories, but we can never prove them, displaying a remarkable similarity to religious ideas. And religion deals with “working hypotheses, tested and validated by experience,” not so different from science. 4) Limits of paradox and uncertainty. Knowledge in both science and religion is tentative, laced with paradox and constrained by limits.²

In essence, then, science should not be co-opted into the service of materialism and atheism but instead it should be celebrated as a lasting partner with world religions in service to the wider international culture. Over the years Charlie has consistently voiced this conviction on an international stage. As a Nobel laureate in physics, Charlie personally represents the world of theological education and the world’s faith communities in places where most of us could never go and to people who would never listen to us even if we got there. He has addressed packed audiences from Bangalore to UNESCO with the message that science can be a partner with religion in the quest for the ultimate meaning of life.

I have been privileged to know Charlie as a distinguished mentor and, now, dear friend since we first met nearly thirty years ago. Long before, I read his book on microwave spectroscopy³ while I was an undergraduate in physics at Stanford University, and I used it in my doctoral research in low temperature microwave spectroscopy at the University of California, Santa Cruz in the 1970s. Still I first met Charlie not at a physics event but at church! It turns out that Charlie and his dear wife Frances, whom he married in 1941, regularly attended First Congregational Church of Berkeley, United Church of Christ. In 1982, after I returned from teaching physics at Carleton College, Minnesota, to the Bay Area, my wife Charlotte and I became members of FCCB. There I got to know Charlie. I was always struck by his boundless love of nature, his wondrous joy in the beauty of our universe, his quest to know and understand the laws of physics, and his deep appreciation of the sheer gift of life. It’s understandable that he worked such long days at the lab: he simply *enjoyed* doing physics, or as he would put it, “physics is fun!” Charlie was a person of inimitable modesty: “I only want to do something useful.” And

²I had the opportunity to respond twice in writing to Charlie’s thoughtful essay. See “An Appreciative Response to Townes on Science and Religion” in *Amazing Light: A Volume Dedicated to Charles Hard Townes on his 80th Birthday*, Raymond Y. Chiao, editor (New York: Springer, 1996), p. 559-564. See also “The science of light and the light of science: an appreciative theological reflection on the life and work of Charles Hard Townes,” in *Visions of Discovery: New Light on Physics, Cosmology, and Consciousness*, Raymond Y. Chiao, Marvin L. Cohen, Anthony J. Leggett, William D. Phillips, and Charles H. Harper, Jr. (Cambridge: Cambridge University Press, 2011), pp. 751-769.

³*Microwave Spectroscopy*, C. H. Townes and A. L. Shawlow (republished by Dover Publications, 2012).

though a truly extraordinary scientist, he was even moreso a person of deep and abiding faith: he longed to be known more as a man of faith in the Gospel of Jesus Christ than as a Nobel laureate in physics.

In 1987 I invited Charlie to join the Board of Directors of the Center for Theology and the Natural Sciences. Over the past twenty seven years he has served on the Board and he has given energy, vision, and financial support to CTNS. Thanks to his generosity we now have the annual Charles H. Townes Graduate Student Fellowship, which honors the best of our GTU doctoral students in theology and science.

In conclusion I believe that the international science and religion communities are truly blessed that one of our members has lived, thrived and triumphed for a century in the austere world of physics and cosmology to convey and to embody in his life and values our shared good news of hope and faith in God. And while his earthly journey is now ended, the journey to which he committed his life so faithfully and with such personal humility, good sense, and hope is ours to continue for his sake and for the sake of the wider world.

I pray that you rest well, Charlie, until we meet again, by the grace of God, in the coming New Creation.

Amen.