Amateur Radio Leads to a Nobel Prize

Dr. Joseph H. ("Joe") Taylor, Jr., K1JT, is co-winner with Russell A. Hulse, WB2LAV, of 1993 Nobel Prize in Physics for discovery of binary pulsars. Taylor first obtained his amateur radio license as a teenager, which led him to the field of radio astronomy and the Nobel Prize.

In his Nobel biography, Taylor says he and his brother "… built crystal sets, taught each other the code, bought the *ARRL Handbook* and built radios from junk TV sets. We were licensed as KN2ITP (me) and KN2ITQ (Hal) when I was 13. We didn't know what it was to be a scientist, but we knew that we enjoyed learning and experimenting with the laws of nature. We both became professors of physics."

"A senior honors project in physics allowed me to … build a working radio telescope. My principal references were … *The Radio Amateur's Handbook* and an early book on radio astronomy by Pawsey and [the late Stanford professor Ronald] Bracewell." For his Ph.D. thesis at Harvard, Taylor says, "Ron Bracewell again played an unwitting role; his 1965 book *The Fourier Transform and its Applications* came out just in time to give me some crucial insights necessary for analyzing the data for my thesis."

Taylor is admired today for his *pro bono* contributions to amateur-radio weak-signal digital communications. He has adapted contemporary radio-astronomy software techniques that extract a weak signal from noise to permit contacts with limited transmitter bandwidth and power, and restricted antennas. His *WSJT* ("Weak Signal Communication, by K1JT") and related open-source programs work with standard amateur transceivers and a personal computer with a sound card. Some also support cutting-edge amateur Software Defined Radio (SDR) hardware. *WSJT* decodes digital EME (moonbounce), meteor scatter, and ionospheric scatter signals, at VHF/UHF and HF skywave propagation. Stanford's W6YX also applies these and other experimental digital radio techniques to amateur satellite communications.

Taylor is also devoted to the education of young people through amateur radio's "hands-on experimentation with technical devices and equipment — things that may start as play, but can lead to deep self-motivating education."

http://www.nobelprize.org/nobel_prizes/physics/laureates/1993/taylor-bio.html
http://www.physics.princeton.edu/pulsar/K1JT/