I once heard that, for a really good scientist, you cannot predict what he or she will be doing 10 years from now. That certainly fits Dave Staelin. When I returned to MIT in 1965, Dave had been working on radio studies of the planet Venus, and, with Alan Barrett and Bill Lenoir, he was in the midst of balloon observations of the earth, using downward-looking radio telescopes of a very small size. Both lines of work continued, as we shall hear from the speakers who will follow. But they took entirely fresh turns—studies from the Voyager spacecraft of low-frequency radio noise emitted from Jupiter, and revolutionary studies of the earth’s atmosphere from U-2’s and satellites. His entrepreneurial adventures and his innovations in signal technology were not in sight.

A lot of his work has involved adventure, whether chasing downed balloons in remote places, chasing financial backing for new ventures, or grappling with NASA for space on a satellite. Now I will talk a bit about his adventure in cosmology, requiring a journey to Barcroft station at 12,350 ft altitude, forging past formidable 20-ft snowdrifts on a just-opened mountain road to get there. That adventure began when Dave, Marty Ewing, and I were talking about how to extend radio measurements of the cosmic microwave background radiation to the domain of millimeter wavelengths, to see if it still followed Planck’s curve for a blackbody temperature of approximately 3K (all of the existing measurements were at longer wavelengths, below 3 cm.). We quickly sketched out a system that would work, chose 32 CHz as our frequency to get into the millimeter wavelengths, a relatively favorable spot to minimize confusion from atmospheric water and oxygen contamination. Through the good offices of Jack Welch, we received permission to use the high-altitude physiological laboratory of Berkeley on White Mountain. White Mountain is not in New Hampshire—it is a 14,000 foot mountain straddling the border of California and Nevada, well-known for its large forest of ancient Bristlecone Pine. We mounted the expedition in June, 1968, with Marty being in charge of the digital electronics, Dave in charge of the radiometric system, and for me—I guess I was in charge of administration. We chose White Mountain because it should have a dry atmosphere overhead, and is east of the Sierras, which should milk a lot of the water vapor out of the westerly winds off the Pacific. June was the earliest the road to the Barcroft station was open, and Dave and Marty led the way while I administered for a week back at MIT. Their trip up the mountain was exciting—the giant rotary plows had just finished boring through the snowdrifts—and the Barcroft station was soggy from melting snow. There was help at hand—the State had imported a crew of convicts to help dig ditches to drain off the water, but of course certain security concerns then had to be attended to. A long journey, to study the Universe when it was only 370,000 years old! When I arrived a week later, Dave and Marty had set up the electronics in the animal room, filled with marmots who squeaked and whistled cheerfully all day long.
The experiment worked—we got an answer consistent with other measurements—but it was harder than we thought. The atmosphere was reasonably dry, but not as dry as we thought it would be. On many days, around noon, just as we were getting ready to begin our measurements, a cloud would build directly overhead, and it was certainly not spontaneous generation of water. Obviously, the High Sierras were not doing their job. Those giant snowdrifts high on White Mountain did not spring out of the ground—they came from above. In retrospect, we would have done just as well waiting for a cold clear winter’s day in Cambridge, when the big Canadian cryogenic engine freezes out the water, and we could have made our measurements from the roof of Building 20. Well, when you do things, you learn a lot. So now, let us hear from Alan Rogers, about Dave’s adventures in the wilds of exurban Boston, at the Haystack Observatory, where the towns of Westford/Tyngsboro/Groton, Massachusetts meet.