

Electrically Small Antennas: Hansen's Contribution and the State of the Art

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Robert Hansen had a extraordinary career as an antenna engineer. Though I did not know him on a personal level, he had an impact on my career trajectory. As a green graduate student giving my first conference talk on electrically small antennas, Bob was the first person to stand up and ask a question, which I answered without a second thought. He even gave me a few positive words after the talk. Of course, I later learned that he was a prominent figure in the field and that he had a reputation for asking tough questions. A few years later, I had been conducting some work in volumetric electrically small antennas, and Bob requested to use some images of our spherical antennas in his book (R. C. Hansen and R. E. Collin, *Small Antenna Handbook*, 2011). As a PhD student, this was an honor for me and certainly encouraged me that my work was having an impact in the community.

As a student, I studied his book on small antennas (R. C. Hansen, *Electrically Small, Superdirective, and Superconducting Antennas*, 2006) several times. I was particularly struck by his brazen labeling of various designs as “Clever Physics, But Bad Numbers” and “Pathological Antennas”. This was the first time I had seen such a strong rebuke of a number of published authors, and one track where I learned that published results should be considered critically.

In this presentation, we will discuss the current state of the art in small antennas and link this to Bob's lifelong work studying small antenna limits. At the same time, we will give consideration to unconventional approaches that may have been overlooked.