

Abstract Submitted
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Boltzmann analyses of swarm experiments over the years
LEANNE PITCHFORD, CNRS and Univ Toulouse — Art Phelps was one of the “grand old men” in field of gaseous electronics. He was a graduate student when the GEC got started and he attended almost all of the meetings over the years. During his remarkably long career, he produced a number of the classic papers in our field as a glance at Web of Science will show. Art was my mentor and friend, and I had the privilege of working with him for many years on various topics related mainly to electron scattering and transport in weakly ionized gases. In this talk, I will discuss the originality of some of his early work on these subjects in the context of their times, focusing in particular on his publications from the mid-1960’s with his colleagues from Westinghouse Research Laboratories. These report the first numerical solutions of the Boltzmann equation for electrons, to my knowledge, and they inspired much subsequent work related to the extraction of quantitative information about low-energy electron scattering with simple gases from measurements of macroscopic parameters (mobility, diffusion,..). I will outline some of the work he and I did together in this topical area using more sophisticated numerical techniques. This and other work in the field eventually led to the establishment of the ongoing GEC Plasma Data Exchange Project which now involves a number of people (the LXCat team), as discussed in Tuesday’s workshop. The LXCat team had completed work on noble gases and had just started working on evaluations of cross sections for simple molecules when Art died. We are fortunate to have had his involvement on these projects. Art had ideas for future work in these areas, and some are included in a long e-mail message from Art a couple of years ago that I will share because it includes some suggestions [to the community] for future work.

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