IN MEMORIAM

John Tompkins Lyman
(May 25, 1932 – May 30, 2018)

John Tompkins Lyman died peacefully in Walnut Creek, CA, on May 30th 2018, a few days after his 86th birthday. John was a key member of the pioneering Radiation Biophysics group led by Cornelius Tobias and John Lawrence at the Donner Laboratory at UC Berkeley in collaboration with the Lawrence Radiation Laboratory (now the Lawrence Berkeley National Laboratory). The focus of this group was to study how beams from the cyclotrons conceived and built by John Lawrence’s brother, Ernest, could be applied in biology and medicine.

John’s contributions ranged from development of ingenious instrumentation and methods for shaping and controlling the beams from these accelerators, to extremely valuable insights into how best to apply these beams for clinical use. John developed highly flexible parallel plate ionization chambers (I), using the recently-developed extremely thin and strong large-area mylar and Kapton films, on which atomic thicknesses of aluminum or gold could be deposited. With clever thin-line masking, metalized coatings could be deposited in different geometrical configurations on the films, such as concentric circles for measuring the dose profile over the field, or quadrants to aid in centering and tuning the beam. A large guard ring deposited outside the collecting electrodes ensured that the electric field was uniform and parallel, and hence that ion collection could accurately reflect delivered dose. The charge from each element was fed to a capacitor in a so-called recycling integrator. When the voltage reached a certain level, the capacitor would be discharged, and a pulse would be sent to a counter. This method of digitizing the dose predated the modern computer techniques for dose collection.

John also developed brass ridge filters to modulate the Bragg peak in these beams, shaping the tool that cut the spiral groove in the brass to conform to isosurvival curves at different points in the “spread-out Bragg peak.” Working with