

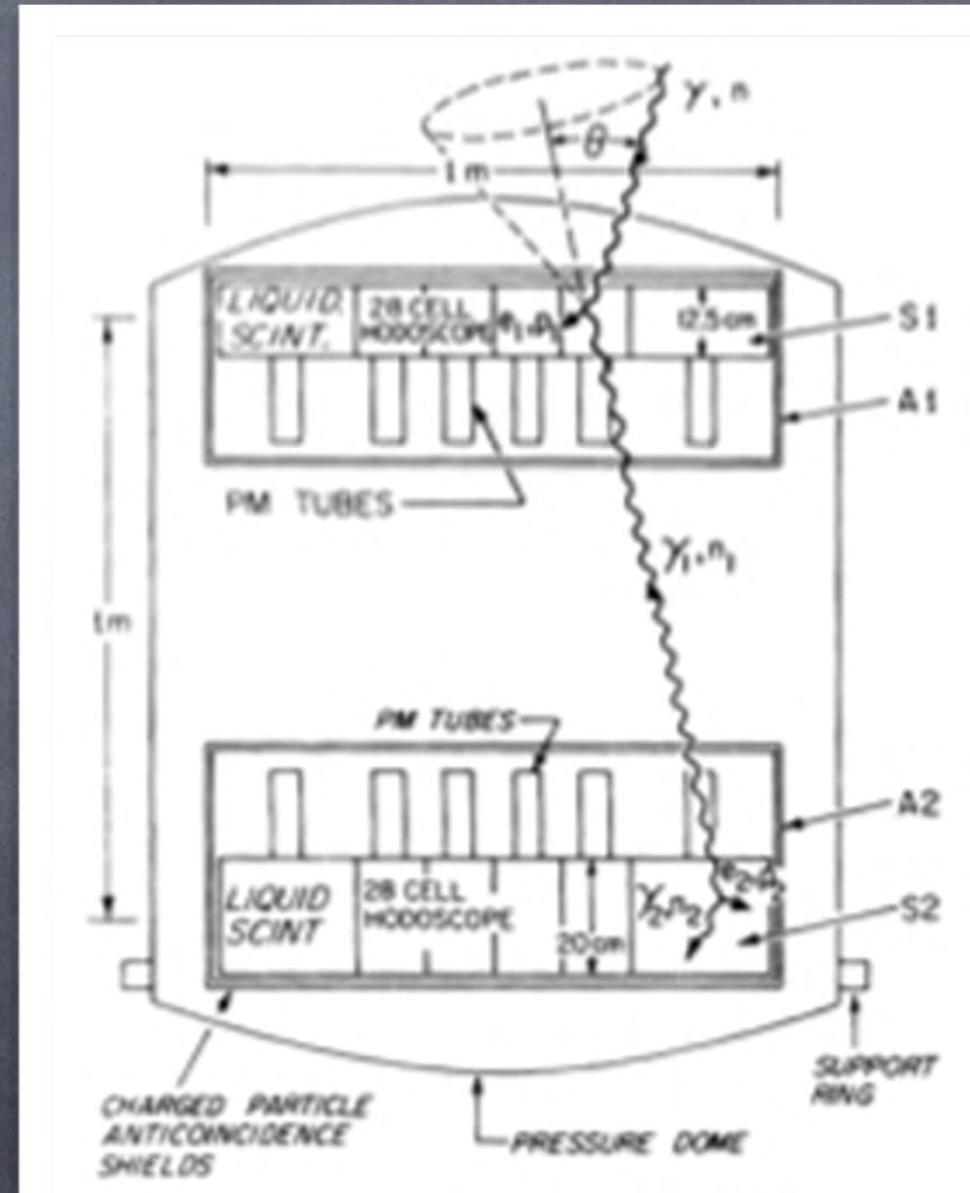
Everything Changes, but Remains the Same

The Double Scatter Telescope Concept
Jim Ryan ('70, '78)

The Basic Concept

Steve White (circa 1965)

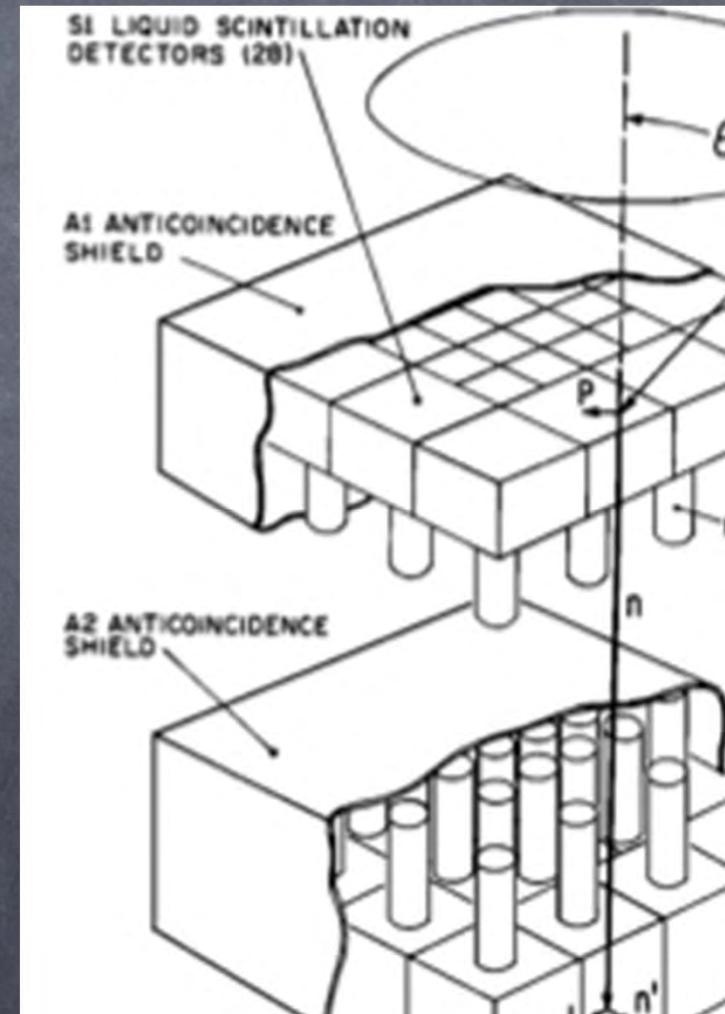
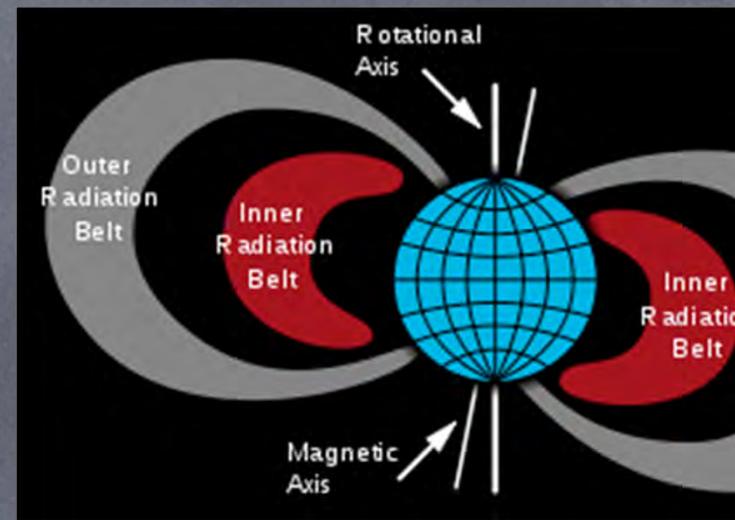
- Two independent detector systems
- Separation provides time of flight
- Ideal for neutral particles (gammas or neutrons)
- Provides energy and restricts entrance

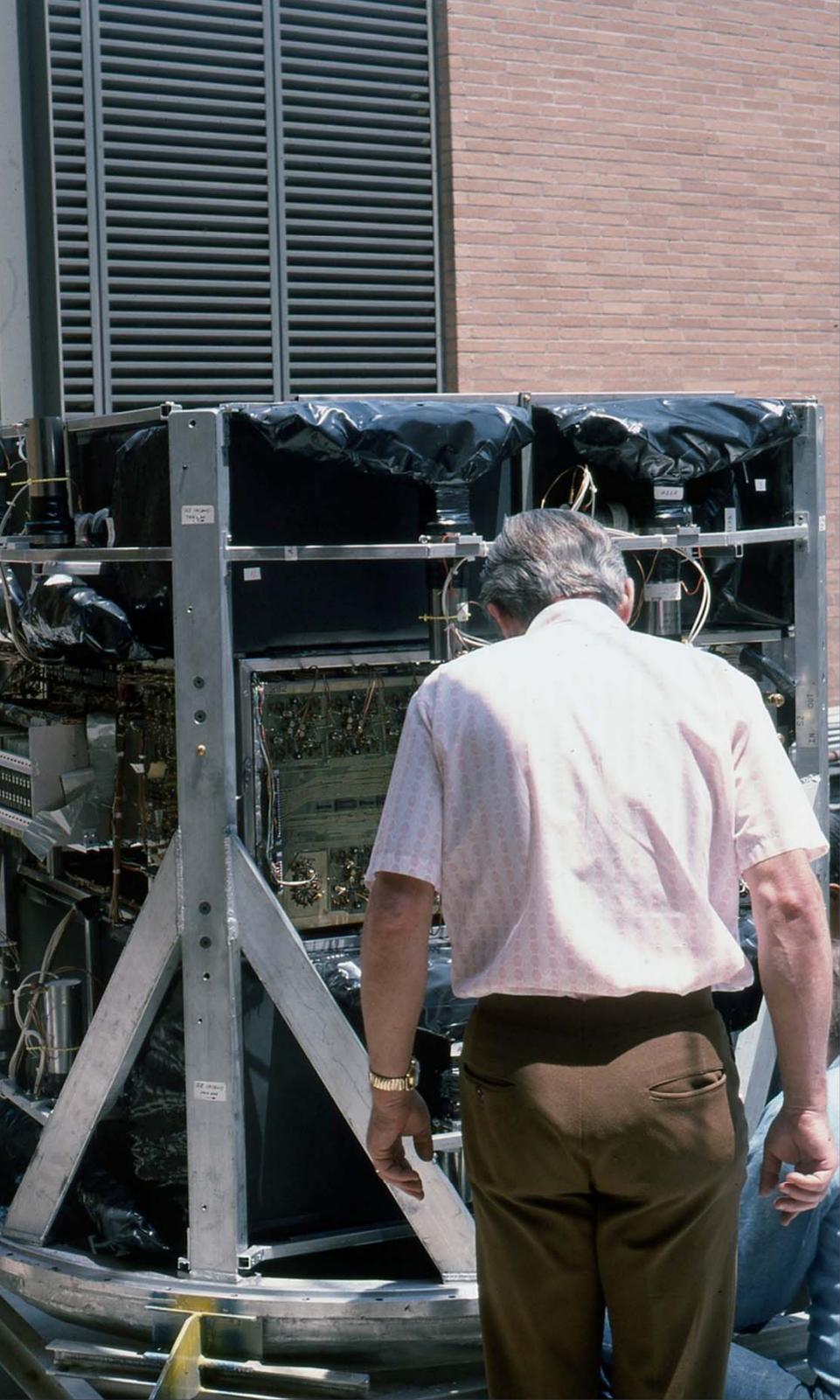


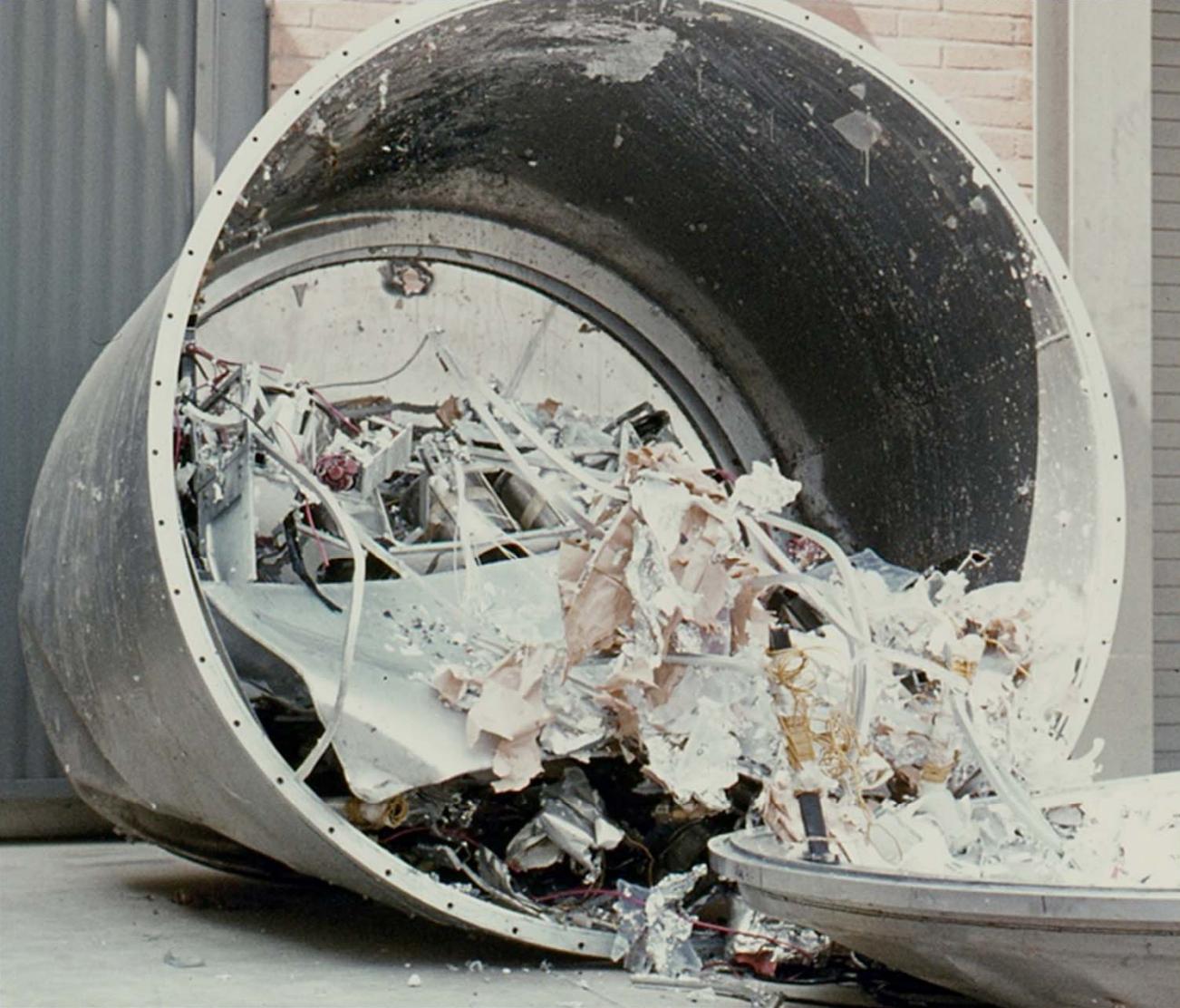
circa 1965

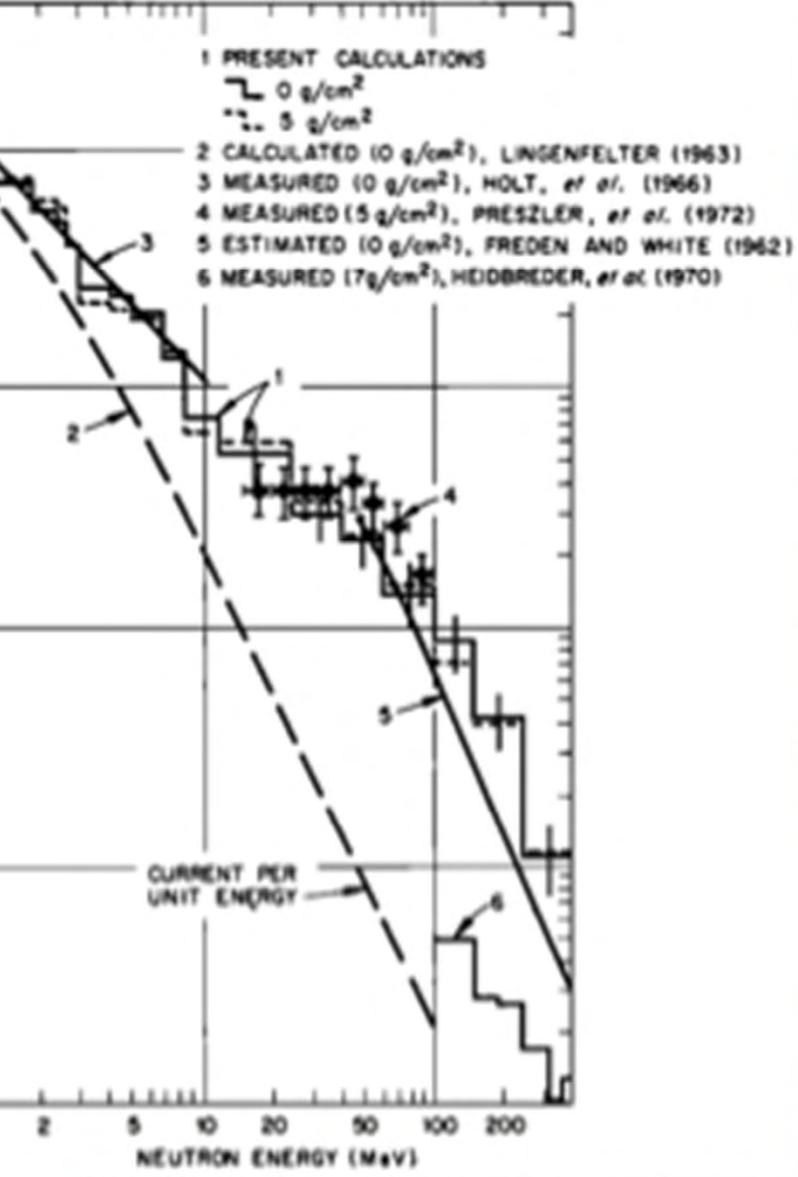
cosmic rays (mostly protons) strike the Earth's atmosphere creating energetic neutrons.

The weak decay of secondary cosmic-ray neutrons puts energetic protons in confining geomagnetic field.





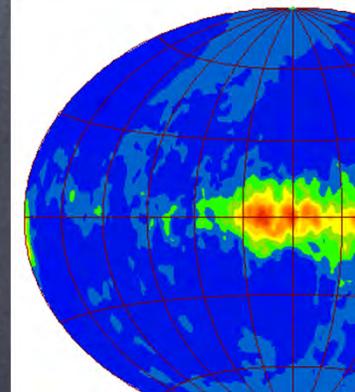
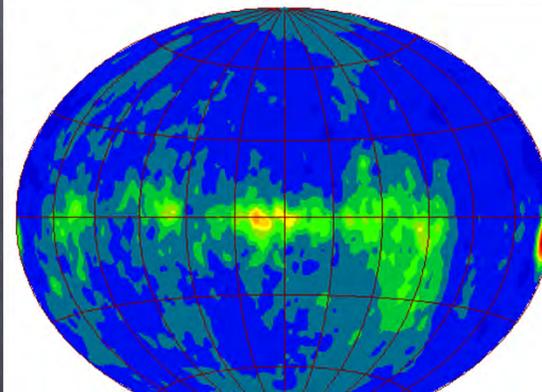
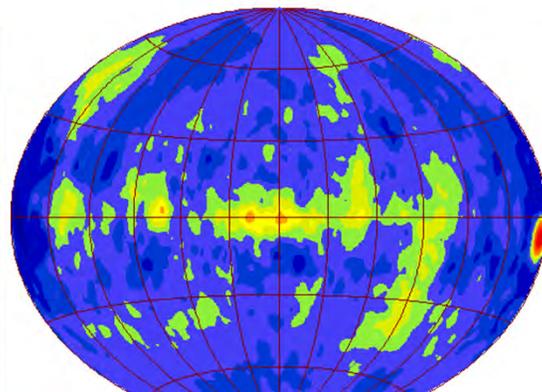
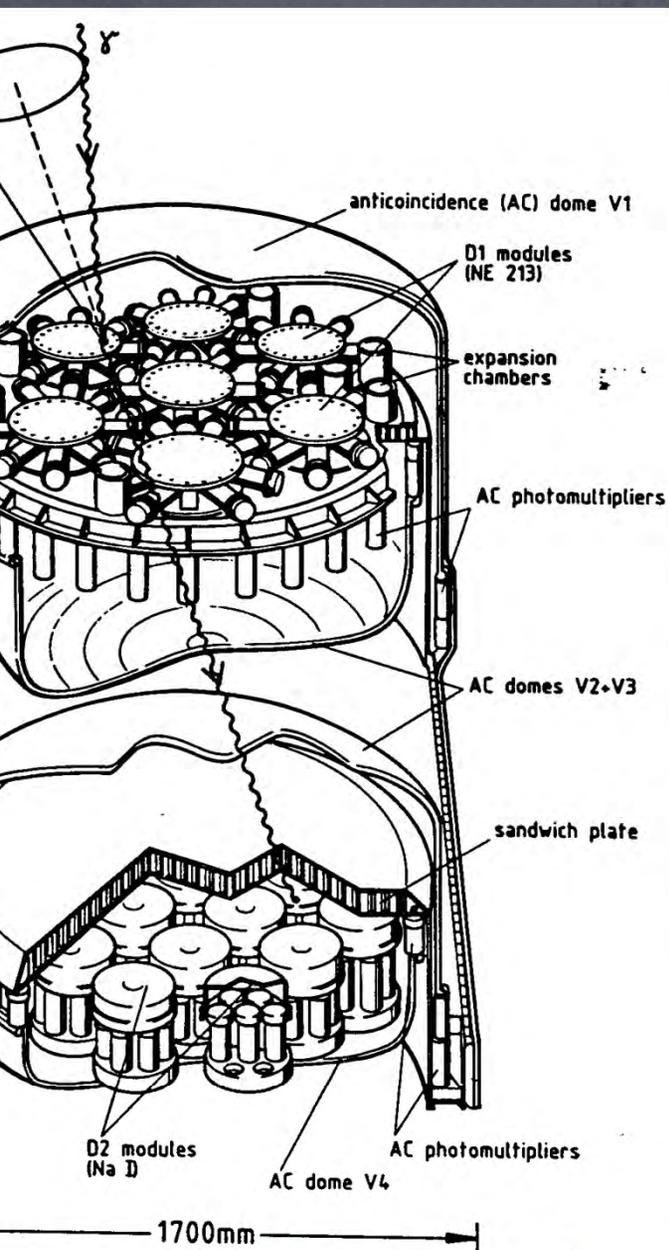




altitude considered, both the present cal-
 and the recent experimental data of
et al. [1972] give a neutron albedo
 reports the Crand theory as the source
 high-energy protons trapped in the inner

Neutrons led to Gammas

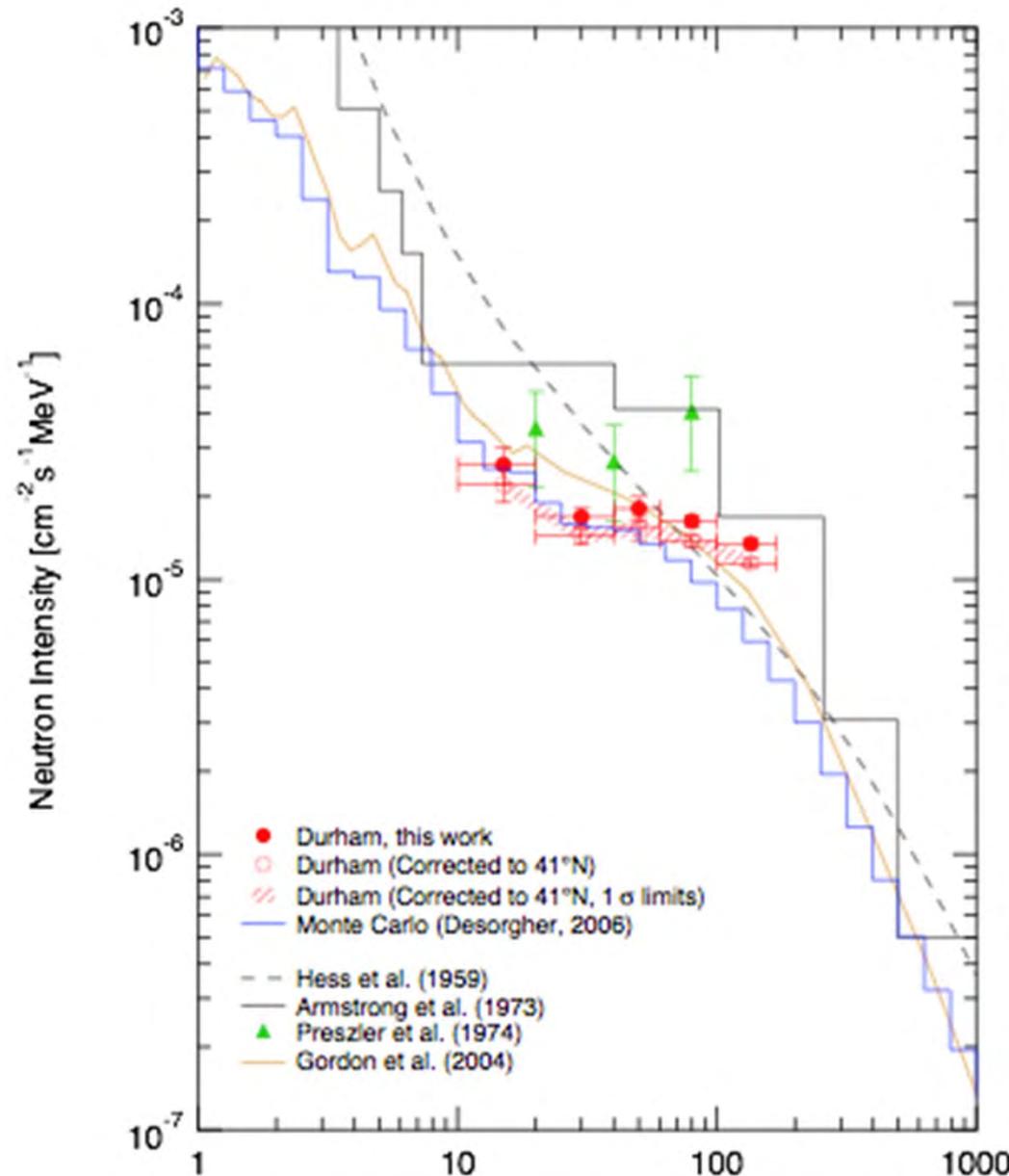
Pursued in parallel by U
and MPE



Neutrons return to fashion (mid 80s)

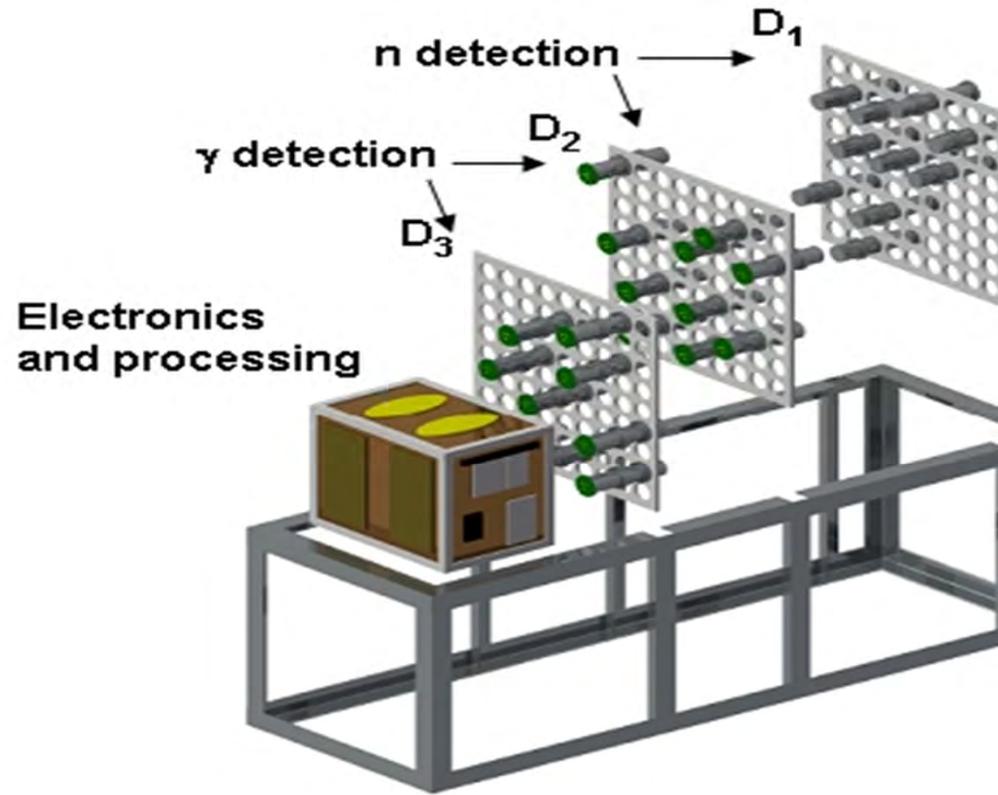
Microelectronic industry was experiencing cosmic-ray effects.

Short ground level measurements by Preszler were not good enough



- Critical need to detect, identify and isolate fissile material

- Neutron/γ signature is unique



Astronomy?

