

Celebration of the 80th birthday of Prof George Kalms

Rutherford Appleton Laboratory

16 April 2015

From Bubble Chamber Holography to the DELPHI solenoid

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Bubble Chamber Holography

- Why? -- Discovery of short-lived particles, expected from 1974

Conventional optics:

$$\text{Angular resolution } \alpha = 1.22 \lambda / a$$

$$\text{But depth of field } D \sim \text{Res}^2$$

- How? -- Holography:

R = reference beam

O = light from object (object beam)

Recorded signal is

$$|R + O|^2$$

C = replay beam

Replayed signal is

$$C|R|^2 + C|O|^2 + CR^*O + CRO^*$$

Resolution is unchanged; Depth of field decoupled from resolution

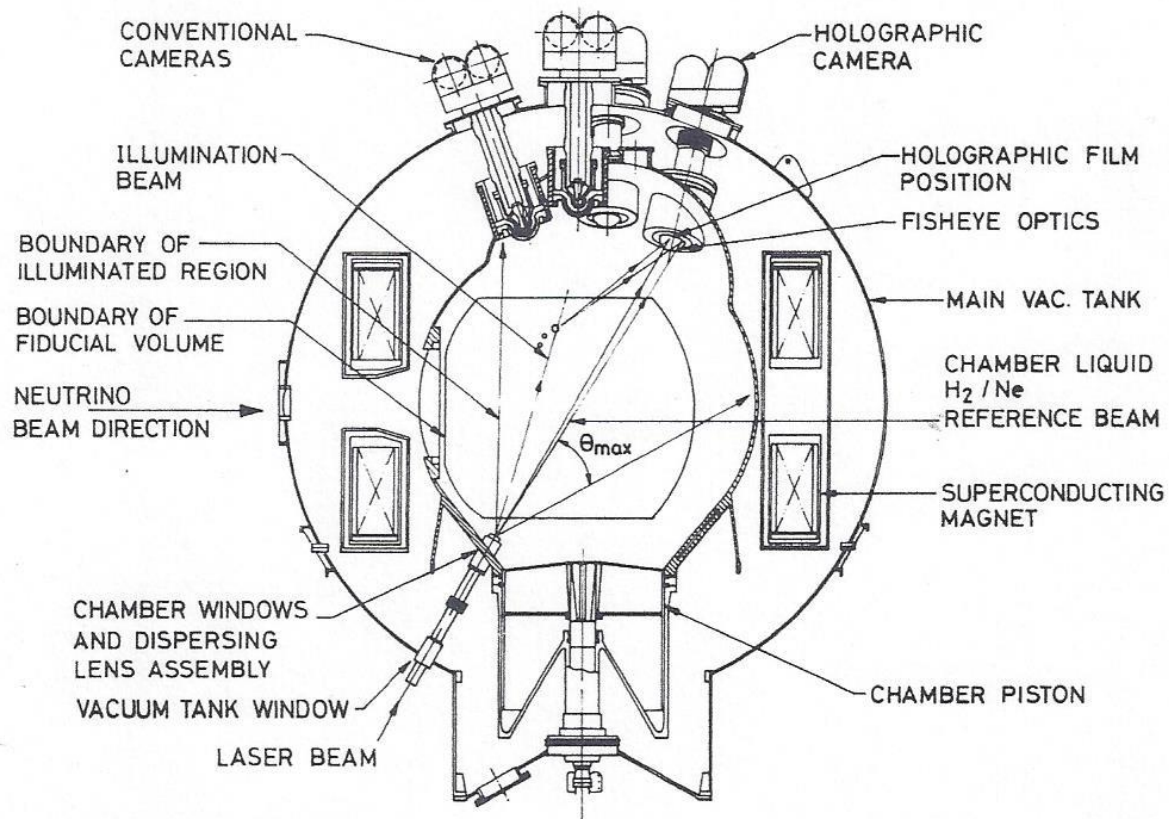
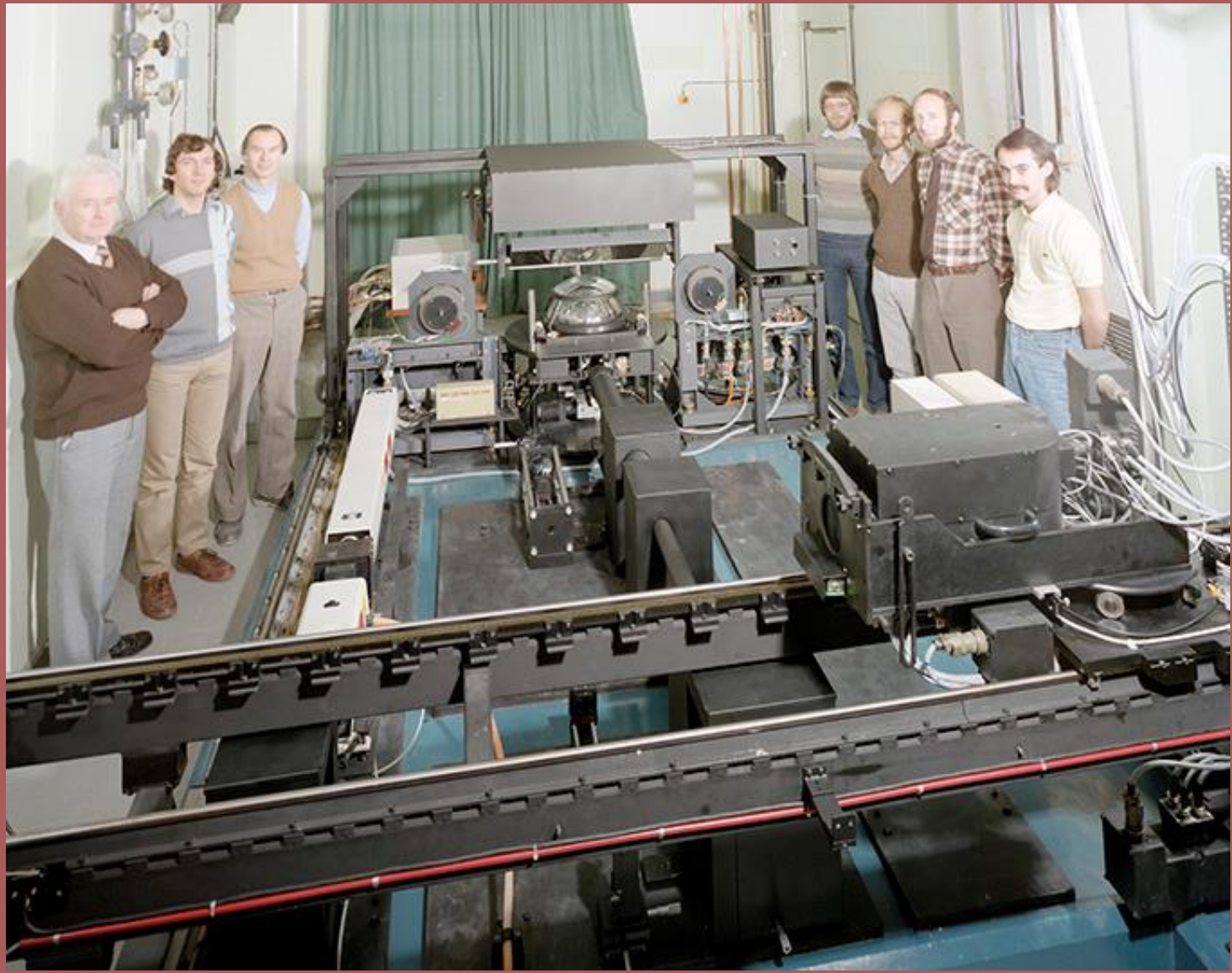


Fig. 1. Sectional view of the Fermilab 15' Bubble Chamber. The optical scheme used for making holographic recordings is indicated.



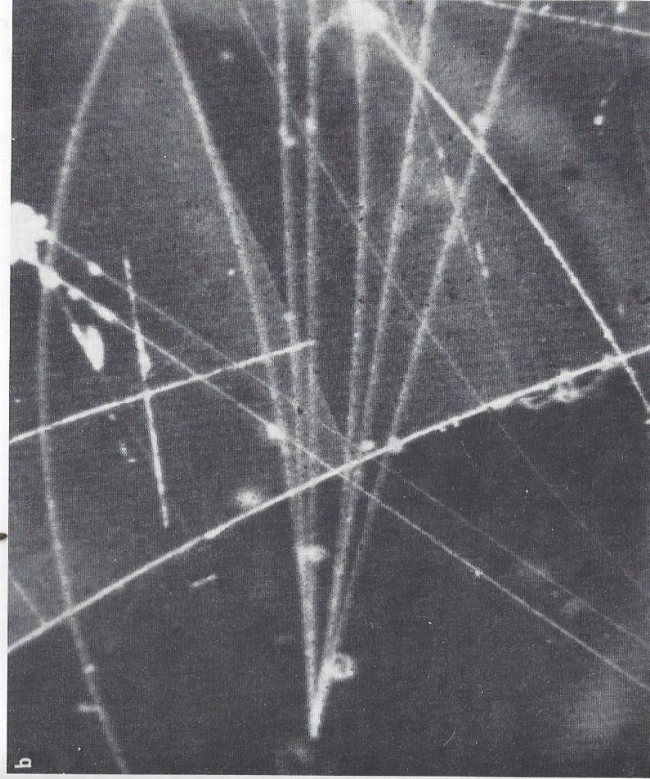
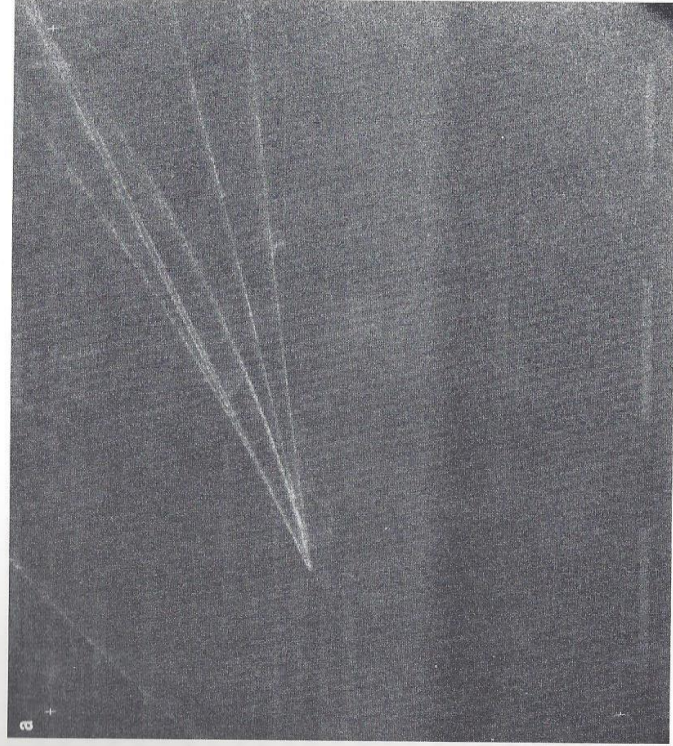


Fig. 7.

Sunday 18 October 1987

