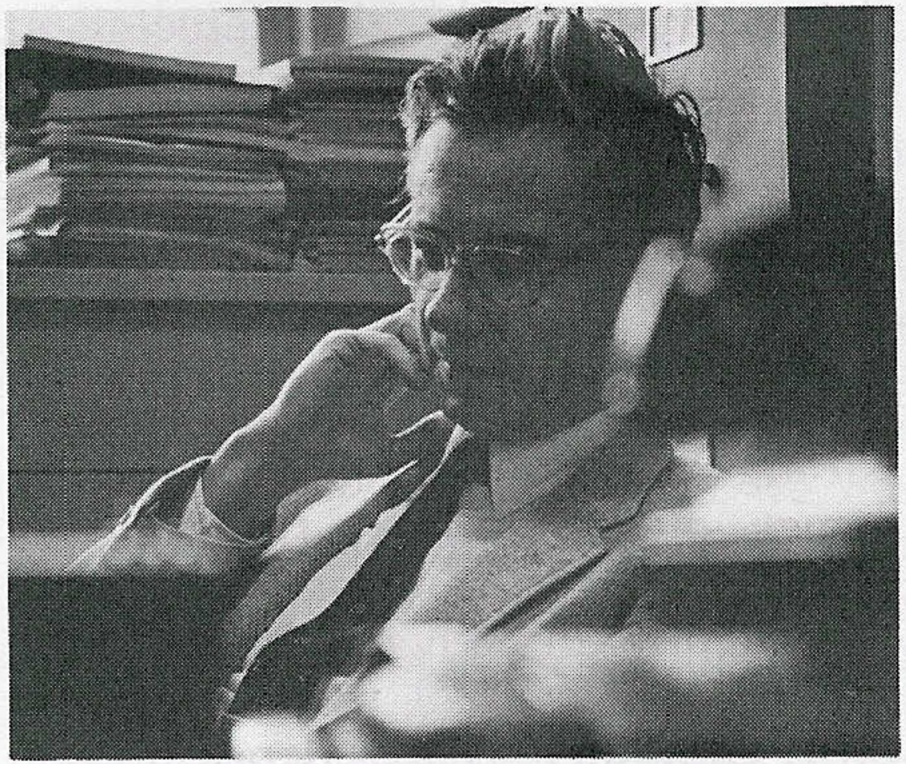
Cornelius P. Browne



"Sometimes nuclear physicists feel they are nothing but plumbers."

1923-2005

PhD 1951 University of Wisconsin

Low Excited States in Li^6 and Be^9

C. P. Browne,* R. M. Williamson,† D. S. Craig, and D. J. Donahue
University of Wisconsin, Madison, Wisconsin‡
(Received May 7, 1951)

VARIOUS investigators[1] have reported an energy level in Li^6 at about 2.5 Mev. Pollard and Margenau[1] find a resonance in the yield of alpha-particles scattered by deuterons indicating a level at 2.4 Mev, and Hushley[1] has observed 3-Mev gamma-radiation when beryllium is bombarded with protons. There is also some indication of a resonance in the yield of deuterons scattered from helium in the early data of Heydenberg and Roberts.[1] Unpublished work of Boyer[1] on the $Li^7(d, t)Li^6$ reaction indicates a level at approximately 2.3 Mev in Li^6.

In the present experiment alpha-particles from the reaction $Be^9(p, \alpha)Li^{6*}$ have been observed with a spherical electrostatic analyzer.[2] Protons of well-defined energy from the Wisconsin cylindrical analyzer were allowed to strike targets of thin beryllium foils or thin layers of beryllium evaporated onto nickel foils of 1×10^{-5} cm thickness. The energy of particles emitted at 135° from the incoming beam are measured with the spherical analyzer. A scintillation counter is used for detection. Figure 1 is a plot of number of emitted particles *vs* energy for an incident beam energy of 2.35 Mev. Peaks corresponding to singly, doubly, and triply charged Li^6 particles and doubly charged alpha-particles from the ground-state reaction are found. In addition, peaks attributed to singly and doubly charged alpha-particles from the excited state

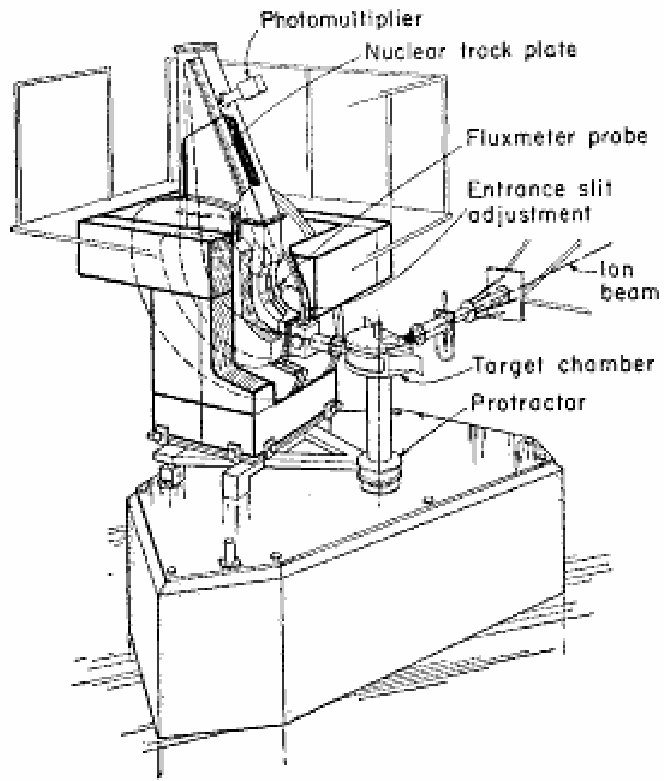


Fig. 1. Schematic diagram of broad-range magnetic spectrograph.

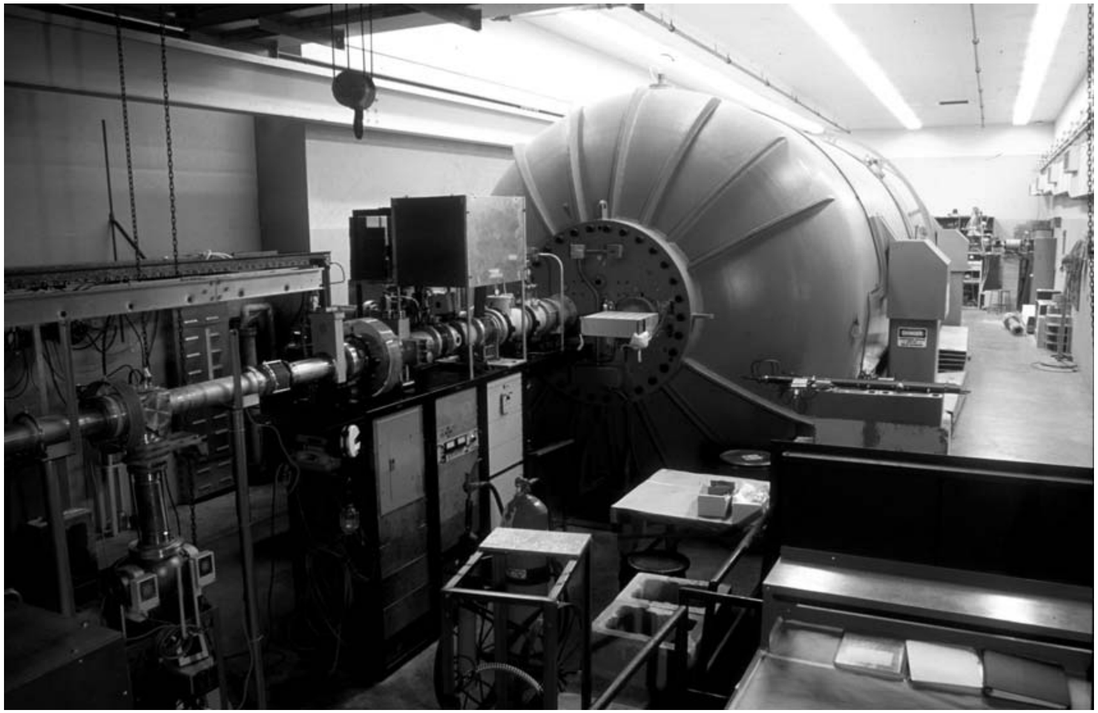
[1] Buechner, Browne, Enge, Mazari, and Buntschuh, Phys. Rev. 95, 609 (1954).

Research Associate at MIT 1951-1956

Development of the high resolution
“Browne-Buechner Spectrograph”
as standard research instrument for
magnetic spectroscopy!

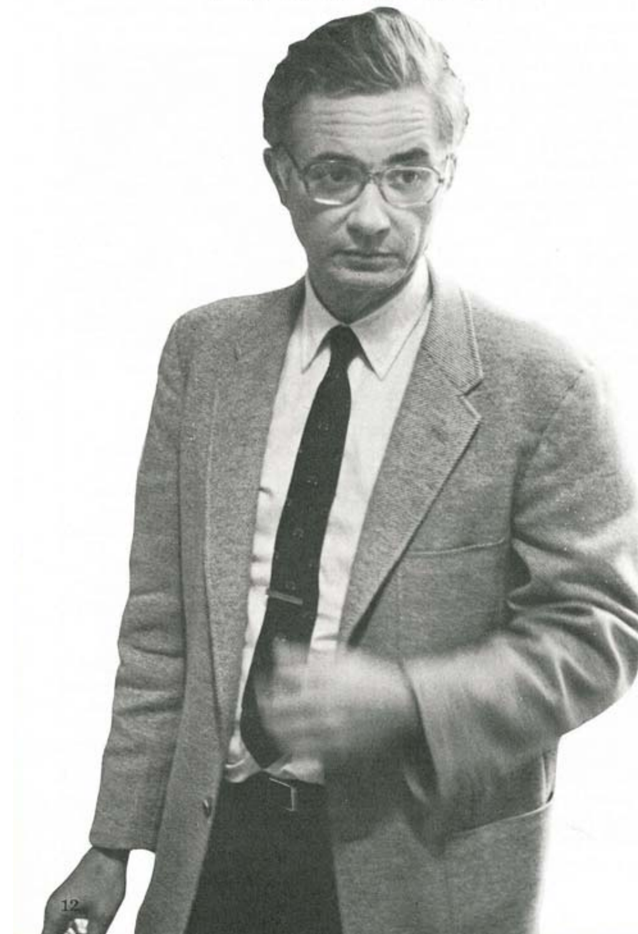
Notre Dame 1956 – 1998

1968 Tandem Accelerator



The proposal was funded with about $2.5 million in December 1965, the largest research grant Notre Dame had ever received. The accelerator itself, a so-called FN tandem machine was purchased for from High Voltage Engineering. The construction started in 1966 and the building was complete in 1967 with the accelerator moved in by railroad in 1968.

Dr. C. P. Browne



PHYSICAL REVIEW C VOLUME 12, NUMBER 6 DECEMBER 1975

Level structure of ^{60}Co†

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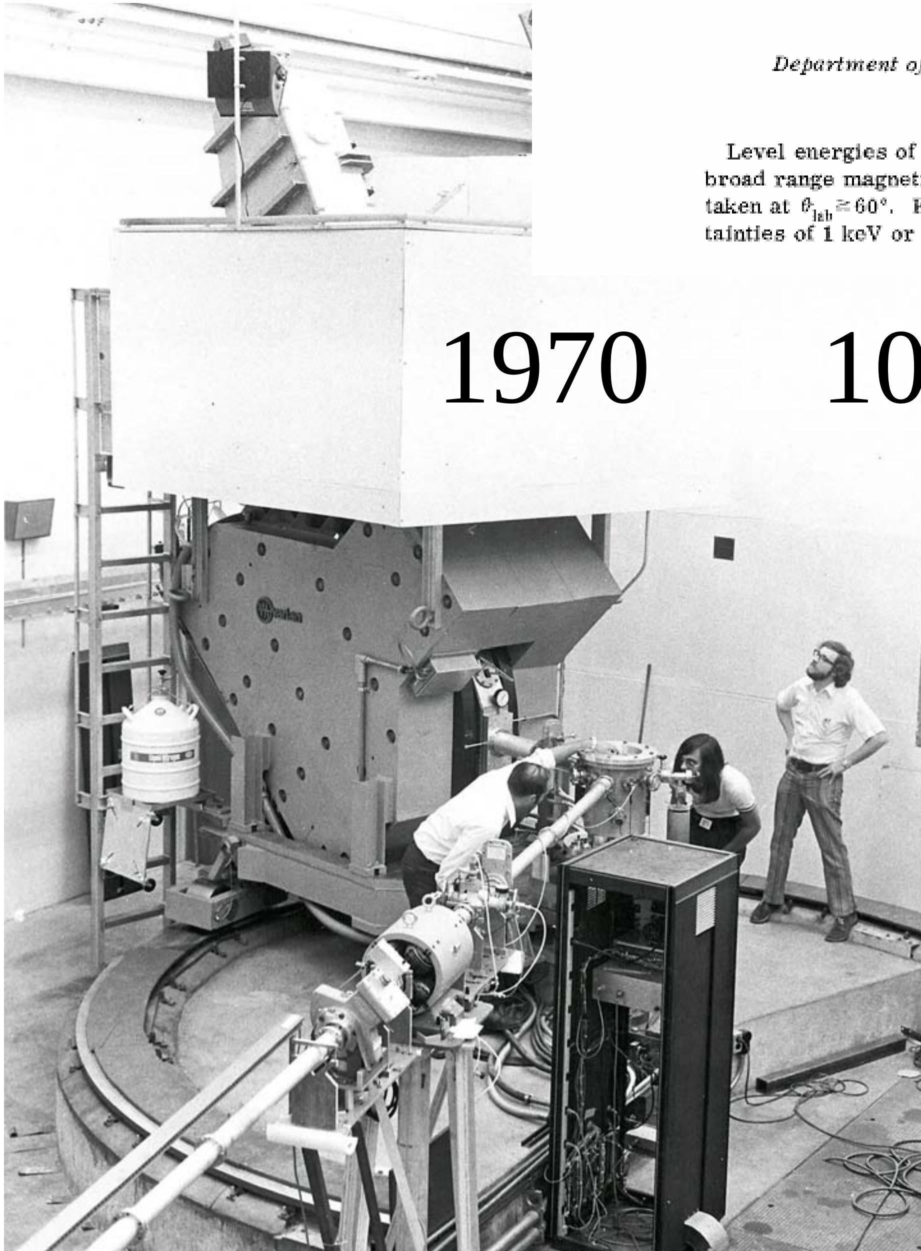
(Received 12 May 1975)

Level energies of ^{60}Co were measured using the $^{59}Co(d,p)^{60}Co$ reaction and the 100 cm broad range magnetic spectrograph. In order to excite nearly all states the data were taken at $\theta_{lab} \approx 60°$. Energies for 89 states having $E_x \leq 3.2$ MeV were measured with uncertainties of 1 keV or less.



1970 100cm modified broad range spectrograph

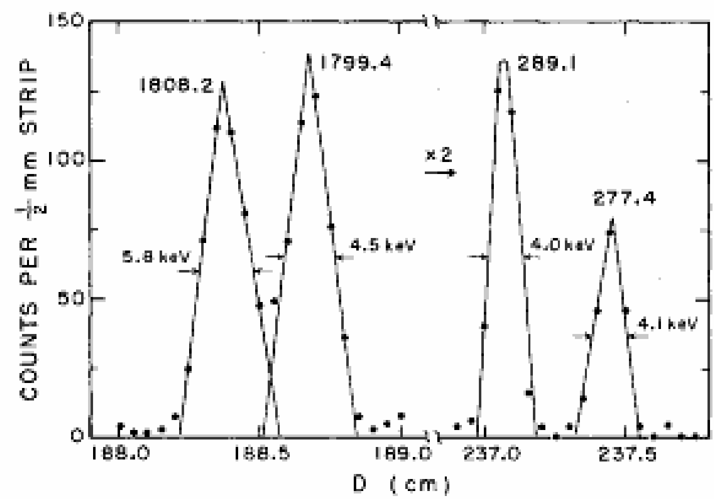


FIG. 1. An example of the best resolution obtained in this experiment. The run was at $E_d = 6$ MeV, $\theta_{lab} = 90°$. A line target 0.05 mm high was used.

PHYSICAL REVIEW C VOLUME 50, NUMBER 2 AUGUST 1994

Reaction rate for $^{31}S(p,\gamma)^{32}Cl$ and its influence on the SiP cycle in hot stellar hydrogen burning

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Department of Physics, University of Notre Dame, Notre Dame, Indiana 46556

A.A. Rollefson
Department of Physics and Astronomy, University of Arkansas, Little Rock, Arkansas 72204
(Received 15 December 1993)

The excitation energies of the proton unbound states in ^{32}Cl have been measured in the $^{32}S(^{3}He,t)^{32}Cl$ charge exchange reaction with high accuracy. The partial widths of the unbound levels have been calculated to derive the resonance strengths of these states in the $^{31}S(p,\gamma)^{32}Cl$ reaction channel. The reaction rate for the $^{31}S(p,\gamma)^{32}Cl$ reaction has been calculated and is compared with previous estimates. The role of this reaction for the closure of the SiP cycle is discussed in terms of the temperature and density conditions in hot stellar hydrogen burning.

From Structure to Astrophysics

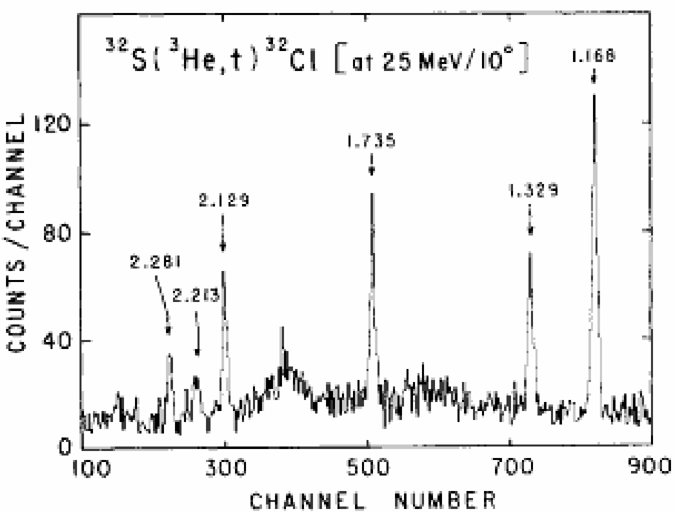
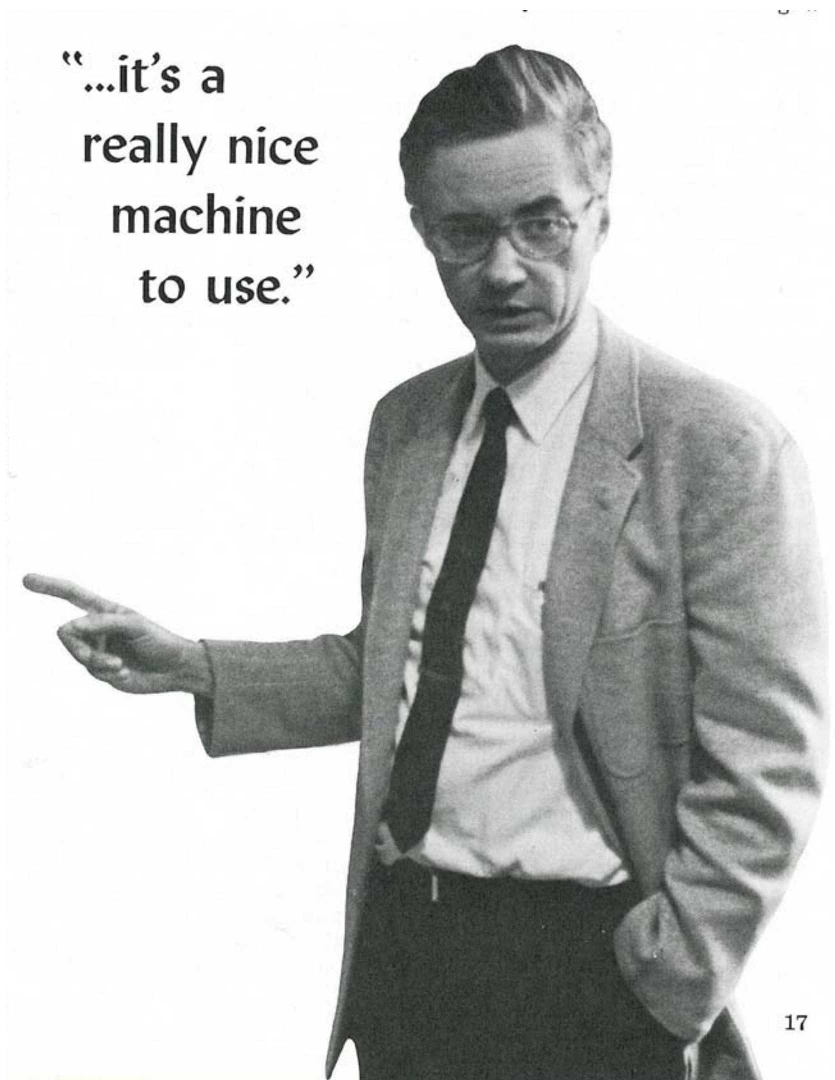


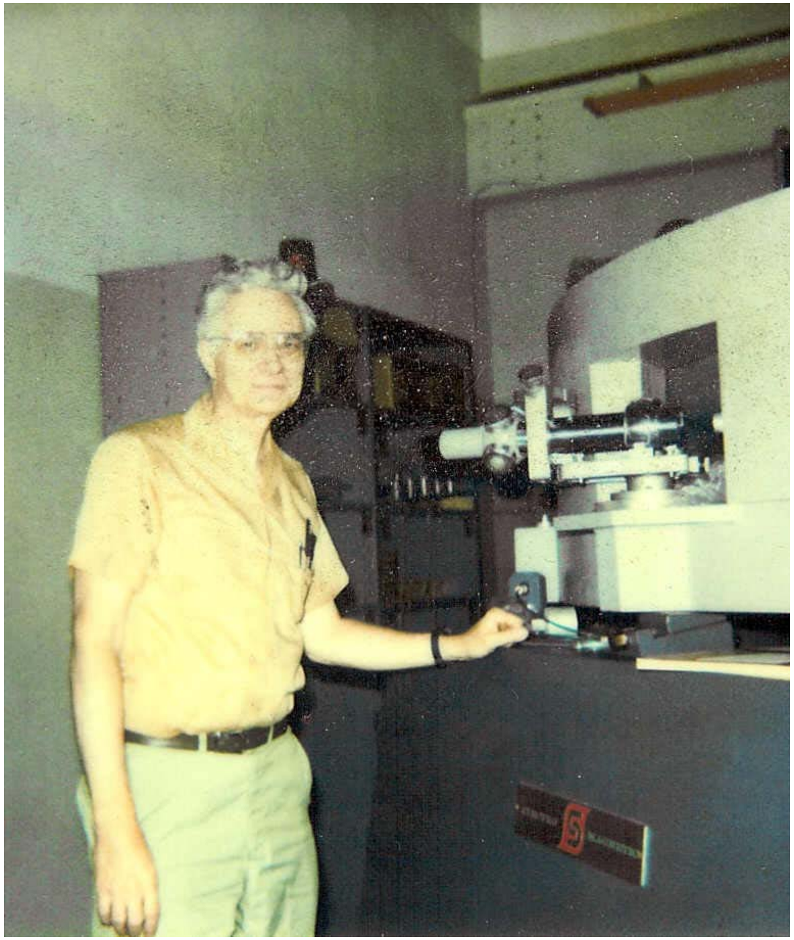
FIG. 2. A $^{32}S(^{3}He,t)^{32}Cl$ triton spectrum measured at $\Theta = 10°$ with an implanted ^{32}S target.

First experimental steps towards rp-process!

Now being converted for AMS work



Director of the Notre Dame Nuclear Structure Laboratory



for 30 years 1968 - 1998

He helped the laboratory to manage and survive the days of funding shortages and crisis in 1976 & 1992.

A pioneer in mass measurements and nuclear level structure studies