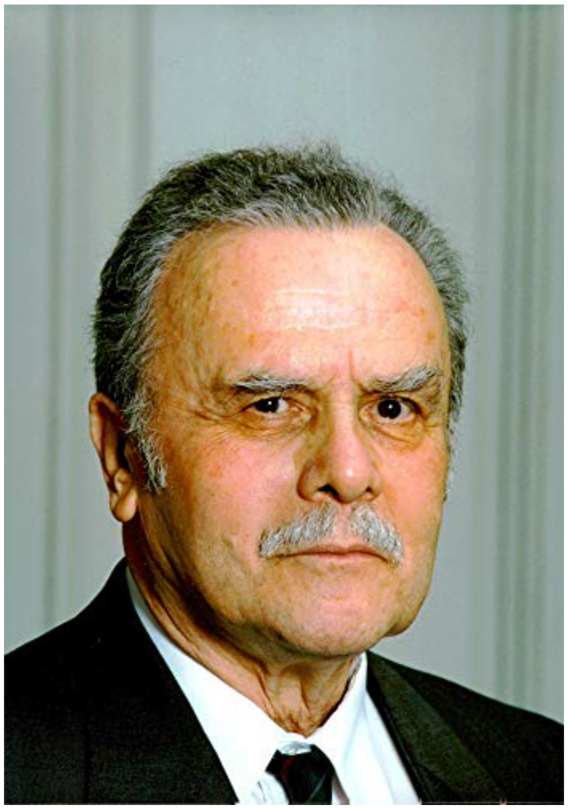


Bert Brockhouse and Canadian Neutron Scattering

A personal view

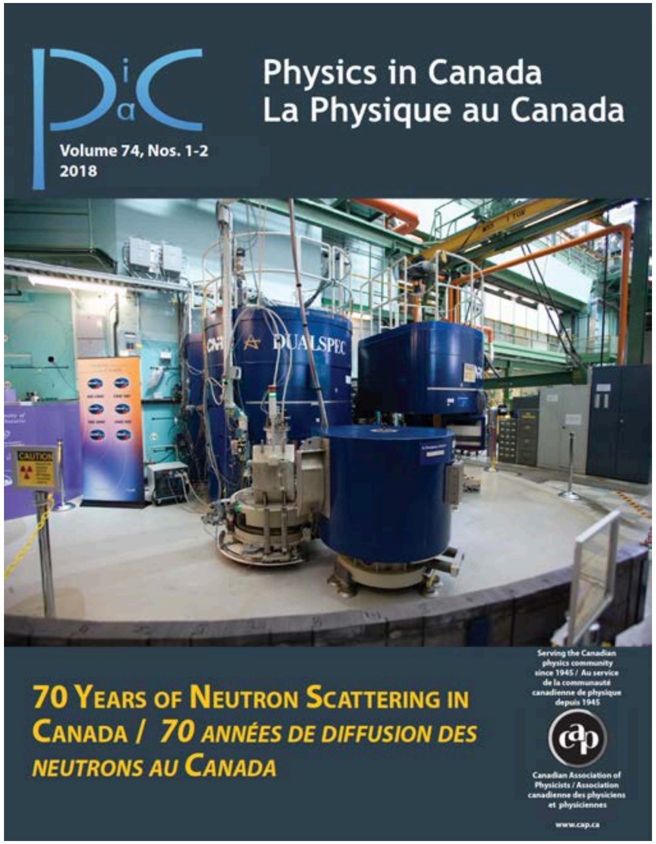
J. Michael Rowe

University of Maryland and
National Institute of Standards and Technology

June 2019

Neutron Scattering and AECL References

- Neutron News **29:2**, review by Daniel Banks, written on the occasion of the closure of the NRU reactor on March 31, 2018.
- 70 Years of Neutron Scattering in Canada, PIC, **74.1,** 2018
- Although it is now impossible to carry out state of the art experiments in Canada due to the closure of NRU, the community continues to exist, and is highly productive using non-Canadian sources (see talks that follow).



Brockhouse References

1. "Slow Neutron Spectroscopy and the Grand Atlas of the Physical World," Brockhouse Nobel Lecture, Rev. Mod. Phys. **67**, 735, 1995 or
https://www.nobelprize.org/uploads/2018/06/brockhouse-lecture.pdf

2. Brockhouse Autobiography at Nobel Prize site:
https://www.nobelprize.org/prizes/physics/1994/brockhouse/facts/

3. Bertram N. Brockhouse, McMaster Department of Physics, Biography by J. R. D. Copley, 1984,
https://www.physics.mcmaster.ca/research/bertram-n-brockhouse.html

4. Web of Science: 4,739 citations (no self) for 73 papers

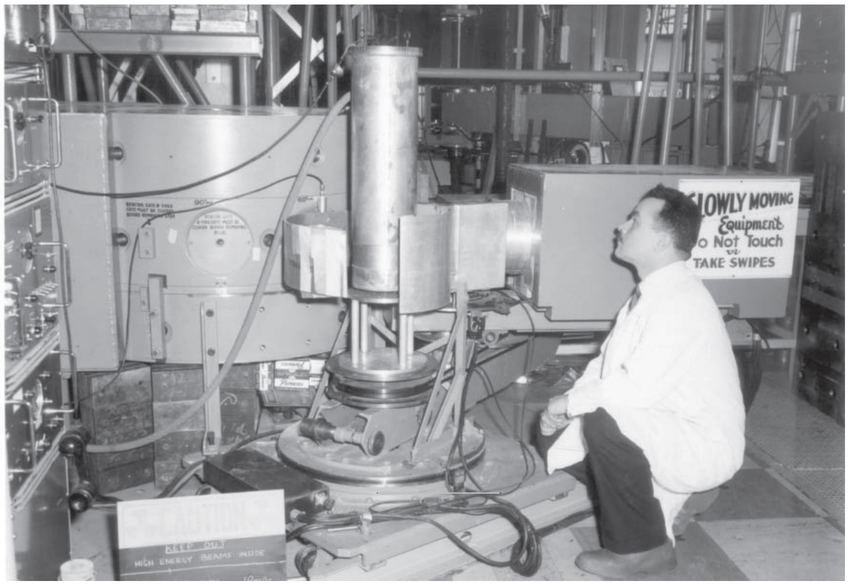
My Introduction to AECL

- 1960 visit to NPD at Rolphton and Deep River
- 1961 Summer student in Reactor Engineering (GFP stripper design for NRX)
- 1962 Summer student in (Reactor Development?) Radiation sensitivity of thermocouples - met Bert and Eric Svensson at the IAEA meeting
- Sailed Hugh Carmichael's Y-Flyer with Wally Zuk – won one race, all other boats capsized!
- 1962-66 Thesis research with Bert using AECL as well as McMaster facilities

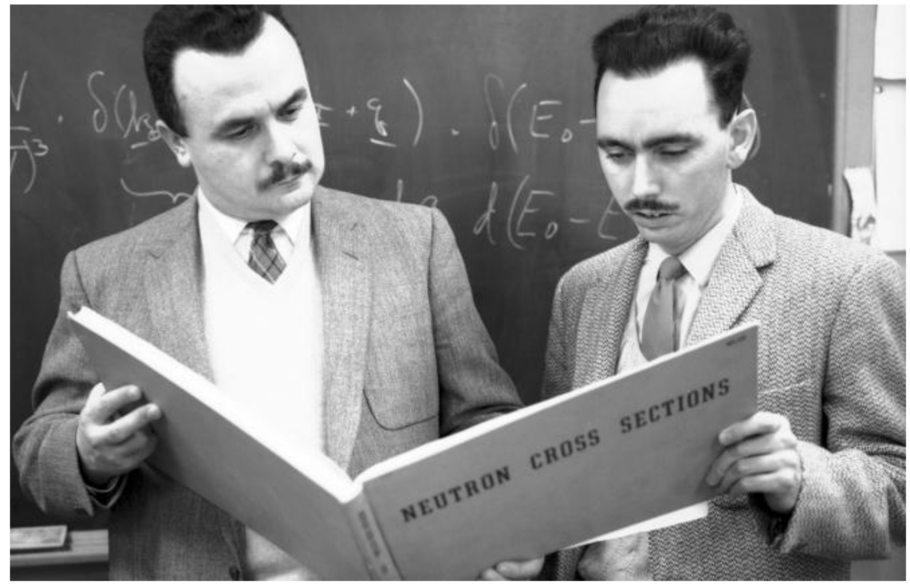
Introduction

- I urge you to read Bert's autobiography on the Nobel Prize web site. He followed a circuitous and interesting path (including voluntary service in the Navy during WW-II) to the career that resulted in the 1994 Nobel Prize in Physics.
- It is also important to note that the high power research reactor NRX at Chalk River began operation in 1947 at 10 MW, increasing to 42 MW by 1954 (followed by NRU at 135 MW in 1957), making Bert's subsequent career possible.
- The first inelastic measurement was a study of highly absorbing elements with Bloom and Hurst, published in 1951 (Breit-Wigner)
- Condensed matter physics (solid state physics then) exploded in these years.

Early Days at Chalk River

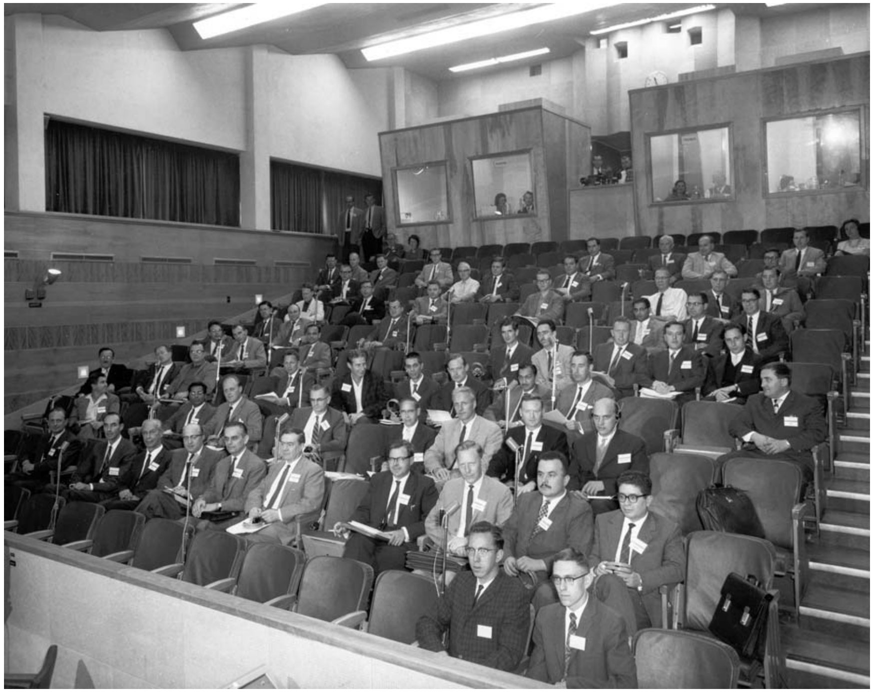


Early (1958?) triple axis
spectrometer at NRU



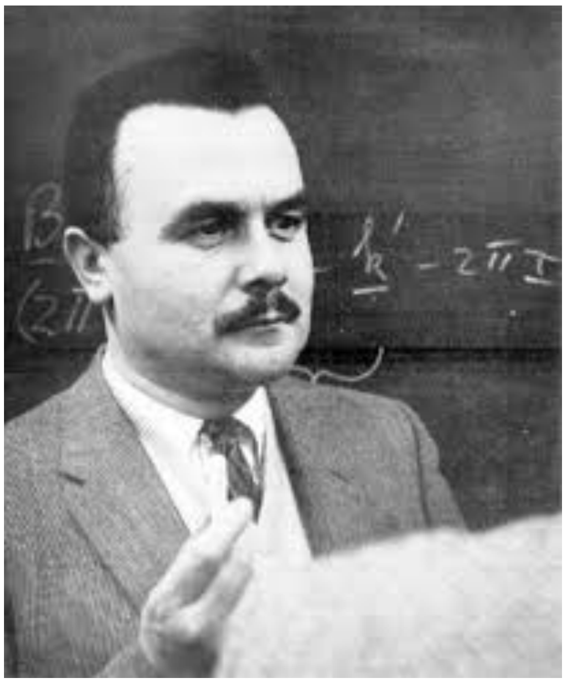
Bert with ADB (Dave) Woods
consulting BNL-325

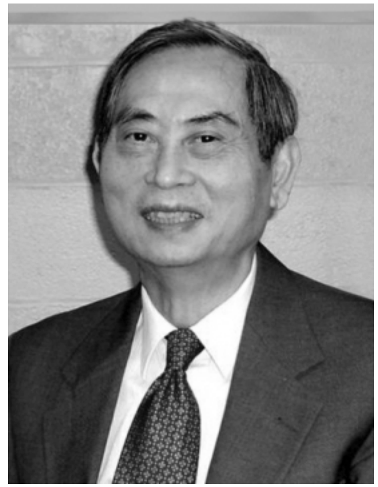
IAEA Meeting at Chalk River 1962 and Dualspec opening 1971



Source: https://www.iucr.org/world/photos/canada/dualspec-and-c2-opening

McMaster, Fall 1962

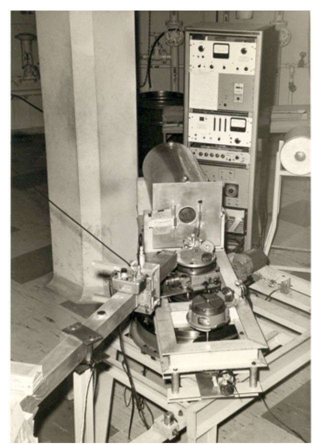




Chen

Svensson

Rowe



2-axis

3-axis

Spectrometer Control System

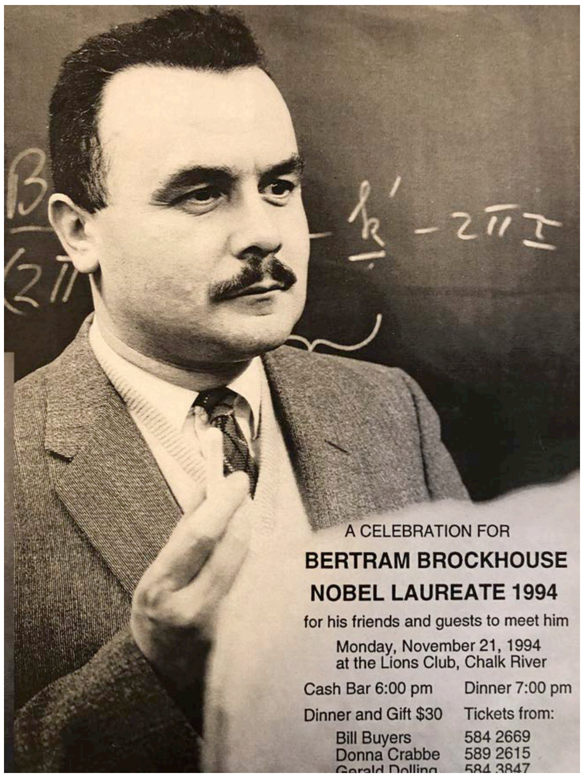
Chen's Graduation 1964

Dorie, Bert, Ching-Chih, and Sow-Hsin

Many of Bert's Graduate Students at Bert's Retirement in 1984

Back Row: Hallman, Dymond, McDonald, Kamitakahara, Svensson, Miiller
Front Row: Chen, Rowe, Brockhouse, Copley

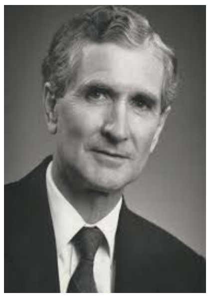
AECL Celebration 1994



With Alec Stewart

Some colleagues – a very small sample


Hurst


Dolling

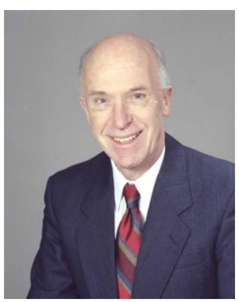

Egelstaff


Birgeneau


Powell


Cowley

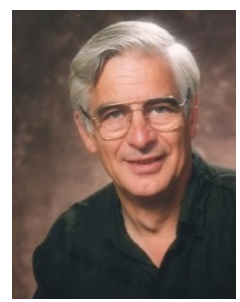

Holden


Buyers


Shirane


van Hove


Sears


Martel


Iyengar


Dixon

Conclusions?

- Bert was a unique individual, with many talents, not least of which was his ability to attract and work with other talented individuals
- He drove neutron scattering from a thought to a thriving enterprise, not only in Canada but world wide
- Thank you for the invitation to help celebrate this anniversary, it was an honor and a pleasure