

# RUTHERFORD & THE NUCLEAR WORLD

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Ryan Barley

# Outline

- History Center History
- Sources and Methods
- Rutherford!
- Outshot



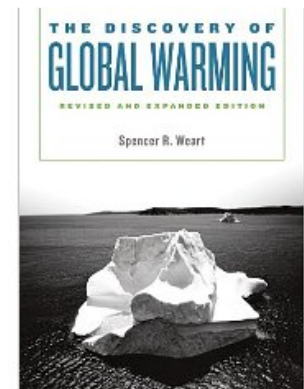
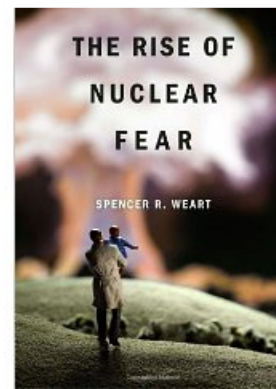
# Center for History of Physics

- Founded in 1961
  - Mission: To Preserve and make known the historical record of modern physics and allied sciences. Through:
    - Documentation
    - Archival collections
    - **Educational initiatives**
- the Center ensures that the heritage of modern physics is safeguarded and its story accurately told
- Includes fields like:
    - Astronomy
    - Geophysics
    - Optics



# Education

- Center plays an active role in communicating heritage of science to both scientists and laypeople
- Staff writes historical articles and books, both academic and popular
- Compile exhibits for museums and **web**



# Web Exhibits

Exhibits and other online resources for history of physics and allied fields



## Bright Idea: The First Lasers

The history of how military demands and physics theories led to the invention of the maser and the laser, with interviews of the scientists and inventors. Text, photos and audio from the Center for History of Physics and the Niels Bohr Library & Archives. LaserFest celebrates the 50th anniversary of the first lasers.



## Marie Curie and the Science of Radioactivity

Her discovery of radium changed our understanding of matter and energy and brought a new era for medicine. The extraordinary romance of her life is illustrated with many pictures and basic explanations. [Download site](#)

### Curie in Brief

The Curie in Brief exhibit is a lively tour of the main points, especially for young people, including letters and other writings by Curie. [Download site](#)



## Albert Einstein: Image and Impact

His astounding theories and his thoughtful philosophy rose above a turbulent life. The story, checked for accuracy by leading historians, will interest all readers. Enhanced with striking pictures, voice clips, and essays, this is a one-stop source for Einstein information. [Download site](#) (3.5 MB PDF) | [En Español](#)



## Cosmic Journey: A History of Scientific Cosmology

# Sources

&

# Methods

- Books
  - Oral History Interviews
  - Lectures
  - Academic Papers and Journals
  - Letters
- Read as much as possible
  - Think about information
  - Write stream of consciousness draft
  - Synthesize into historical narrative (with sources)
  - Implement audio from OHIs and visual media from Segre Archives.
  - Edit it to death



# Result

*Rutherford's*  
NUCLEAR WORLD

HOME  
rutherford's  
nuclear world

SECTIONS  
explore the atom  
with rutherford

CREDITS  
learn more  
about this site

EXHIBIT HALL  
more history of  
physics exhibits

CONTACT US  
get in touch with  
the history center

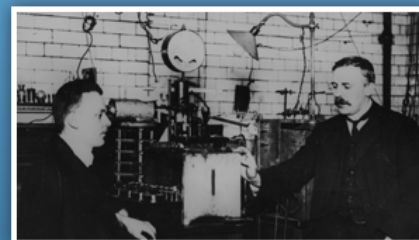
*In 1911, 40-year-old Ernest Rutherford discovered the nucleus of the atom.  
That is the usual, simple, factual statement most science students know quite well.  
The story of this discovery, however, involves more than one person,  
research over several decades, and a very human story.*



Young Rutherford



Exploring Radioactivity



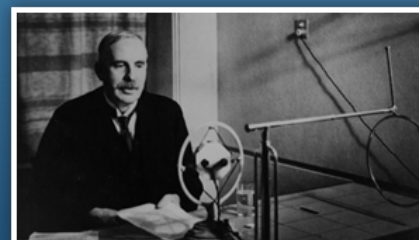
Alpha Particles and the Atom



Atop the Physics Wave



Rutherford's Nuclear Family



Rutherford's Radiations

*Rutherford*



Scanned at the American  
Institute of Physics



# Rutherford: *Brief* Timeline

- Born: 30 August 1871 in Brightwater, New Zealand
- Received his BA, MA, and BSc at Canterbury College, University of New Zealand
- 1895: Received 1851 Exhibition Scholarship to do research at Cambridge
- 1898: Made MacDonald Professor of Physics at McGill University in Montreal
- 1903: Made Fellow of the Royal Society
- 1907: Receives Langworthy Professorship at University of Manchester
- 1908: Nobel Prize in Chemistry
- 1919: Becomes Cavendish Chair of Physics and Fellow of Trinity College, Dublin
- 1925: Elected President of Royal Society
- 1931: Granted the title Baron
- Died: 19 October 1937

# The Professor and the Crocodile

- Origins and childhood
- Manner
- Generosity
- Confrontation



“...In Russia the crocodile is the symbol for the father of the family and is also regarded with awe and admiration because it has a stiff neck and cannot turn back. It just goes straight forward with gaping jaws—like science, like Rutherford”

Letter from Peter Kapitza to Peter Ritchie-Calder

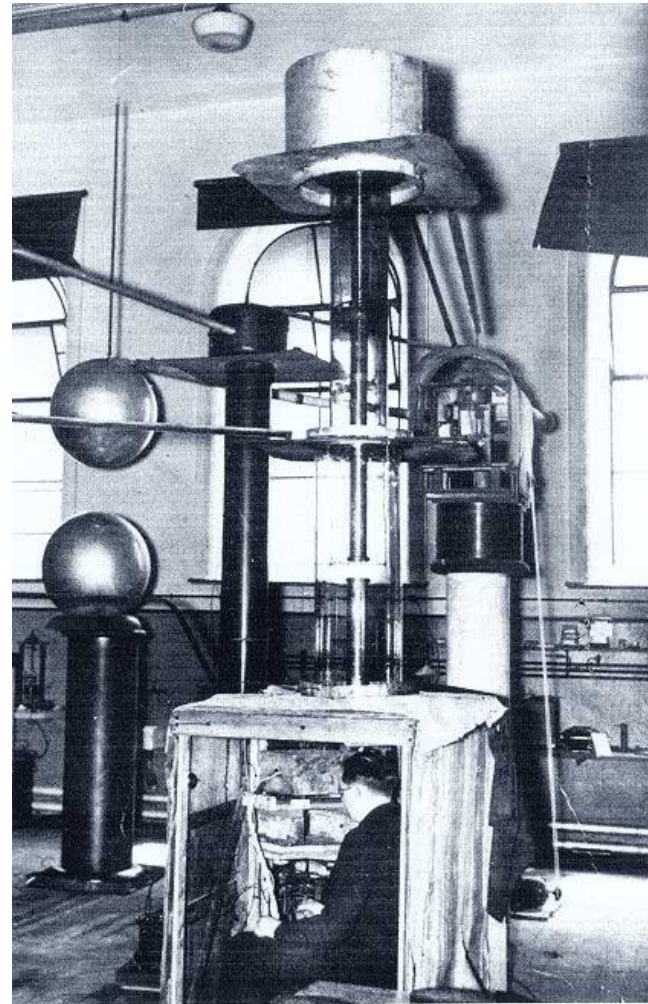
# Cavendish

- 1919-1937
- More of a manager
- Oversaw individual groups, delegated research to them:
  - Blackett
  - Dee
  - Kapitza
- Several important discoveries and at least 7 Nobel Prizes



# Importance

- Medical/Nuclear Physics
  - Von Hevesy
- Particle Accelerators
  - Cockcroft + Walton
- The Bomb
  - Chadwick + Feather

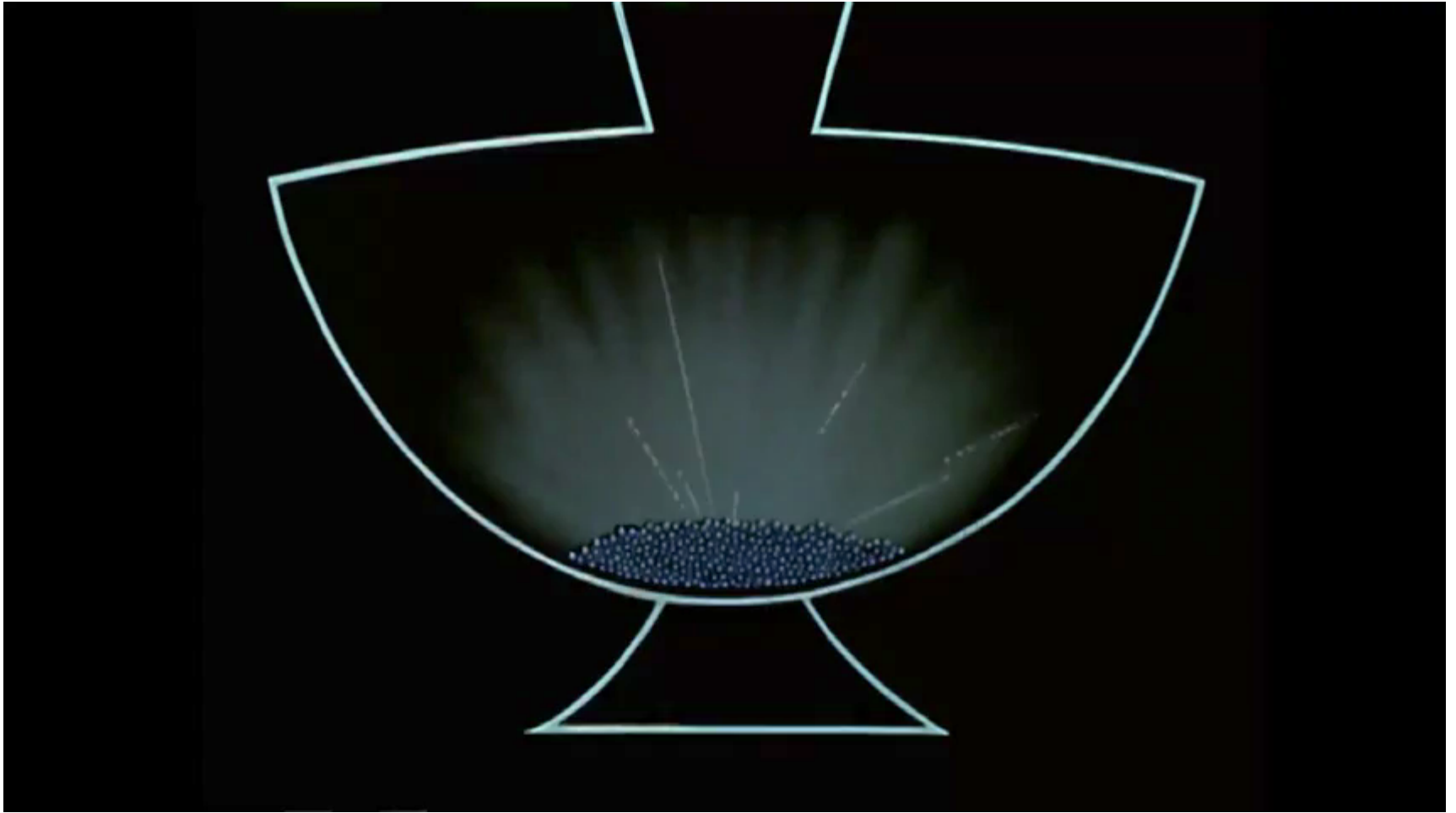




# Popular Culture



# Our Friend the Atom





# Questions



# Acknowledgments

- Greg Good
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- Kim Hukill
- Melanie Mueller
- Joe Carpenter
- Kendra Redmond
- Elizabeth Hook

# Sources

- <http://www.aip.org>
- Emilio Segre Visual Archives
- Niels Bohr Library Oral History Archives
- Chadwick, James. *Collected Papers of Lord Rutherford of Nelson Volume 3*.
- *Our Friend the Atom*