Cloud Chamber Intro

Aha Moments…….
Wilson, Charles Thomas

PowerPoint Presentation - Niagara Science Museumwww.niagarasciencemuseum.org/WilsonCloudChamber.pptCachedSimilar

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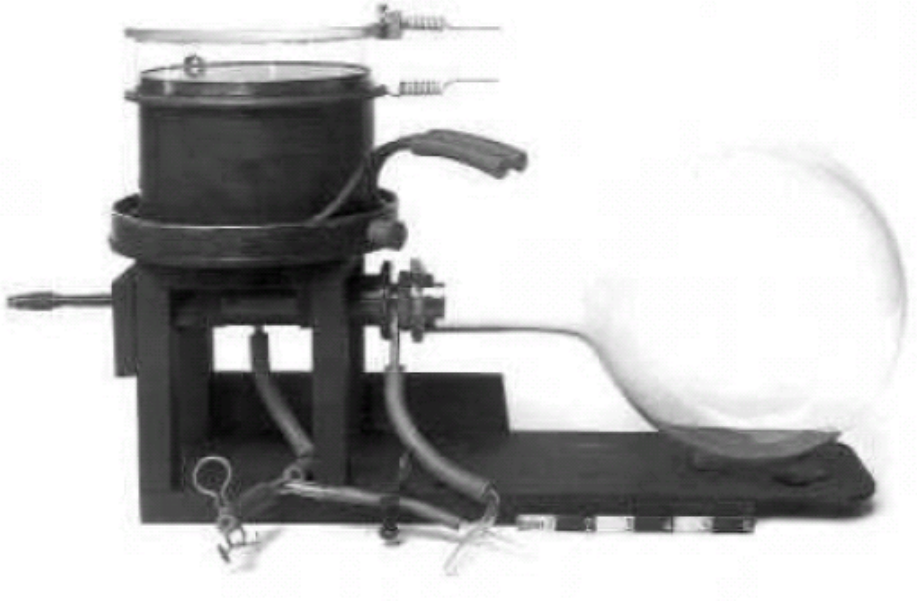
Charles Thomas Rees Wilson** (1869-1959) is credited with inventing the cloud chamber. Inspired by sightings of the **Brocken Spectre** while working on the summit of Ben Nevis in 1894, he began to develop expansion chambers for studying cloud formation and optical phenomena in moist air. Very rapidly he discovered that ions could act as centers for water droplet formation in such chambers. **He pursued the application of this discovery and perfected the first cloud chamber in 1911.



C.T.R. Wilson's cloud chamber of 1912

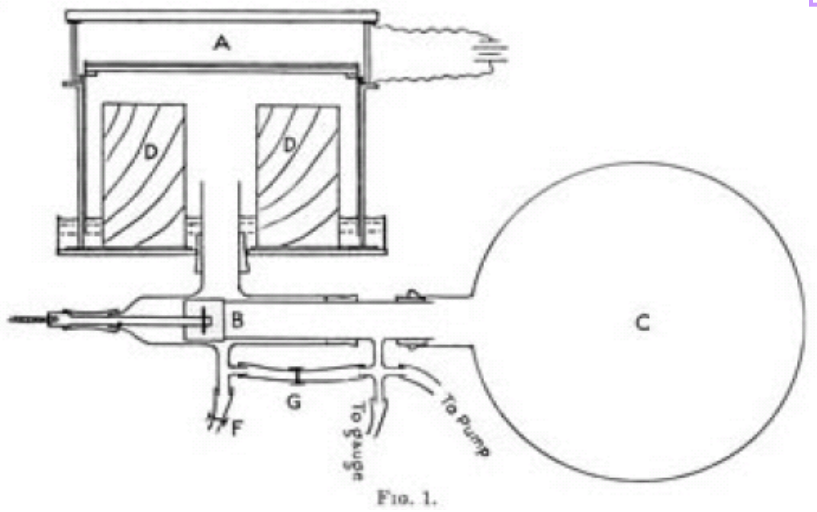


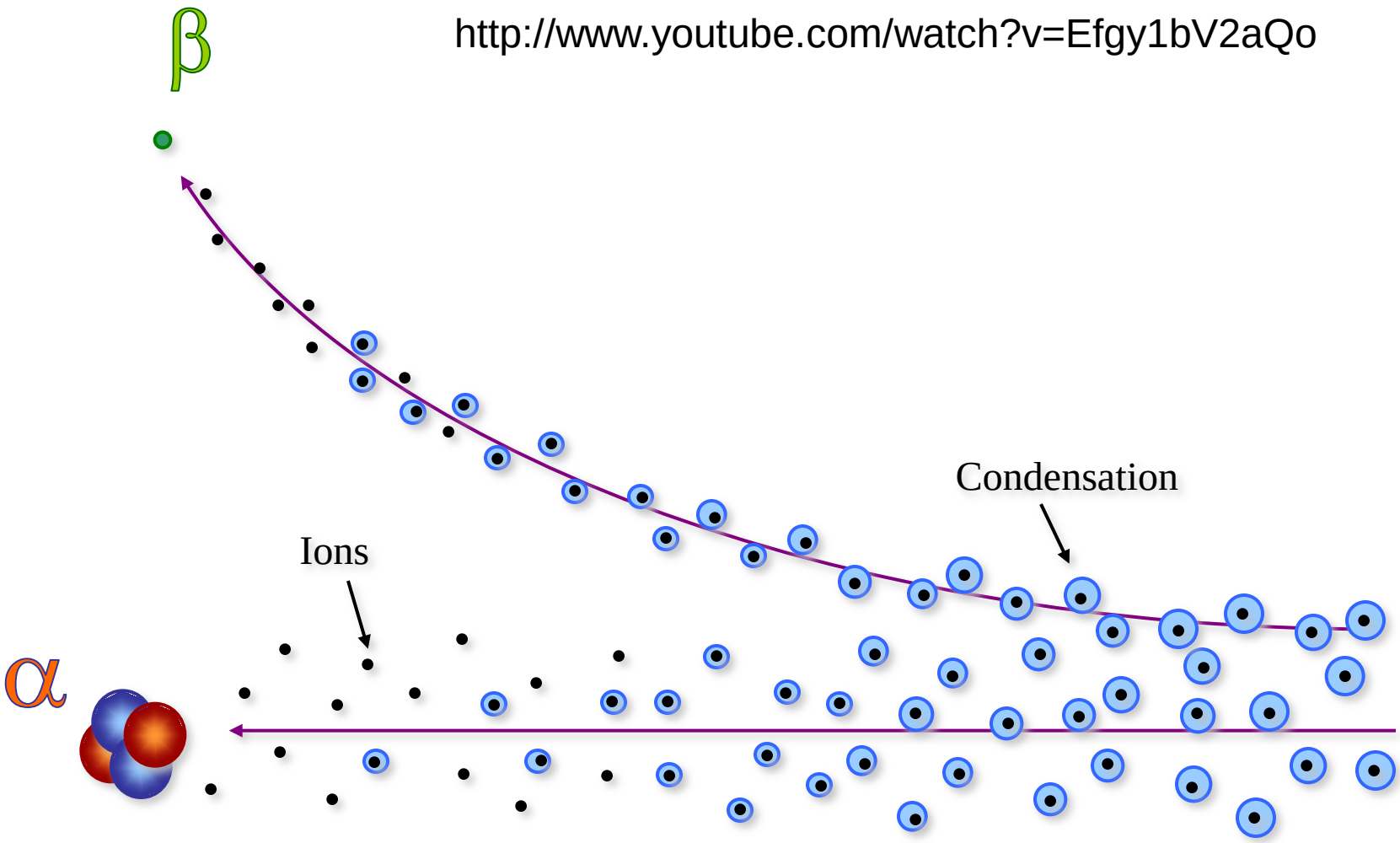
Fig. 1.

A diagram on Wilson's apparatus. The cylindrical cloud chamber [A] is 16.5cm across by 3.4cm deep

In Wilson's original chamber the air inside the sealed device was saturated with water vapor, then a diaphragm is used to expand the air inside the chamber (adiabatic expansion). This cools the air and water vapor starts to condense. When an ionizing particle passes through the chamber, water vapor condenses on the resulting ions and the trail of the particle is visible in the vapor cloud. A diagram of Wilson's apparatus is given left. C.T.R. Wilson, along with Arthur Compton, received the Nobel Prize for Physics in 1927 for his work on the cloud chamber.

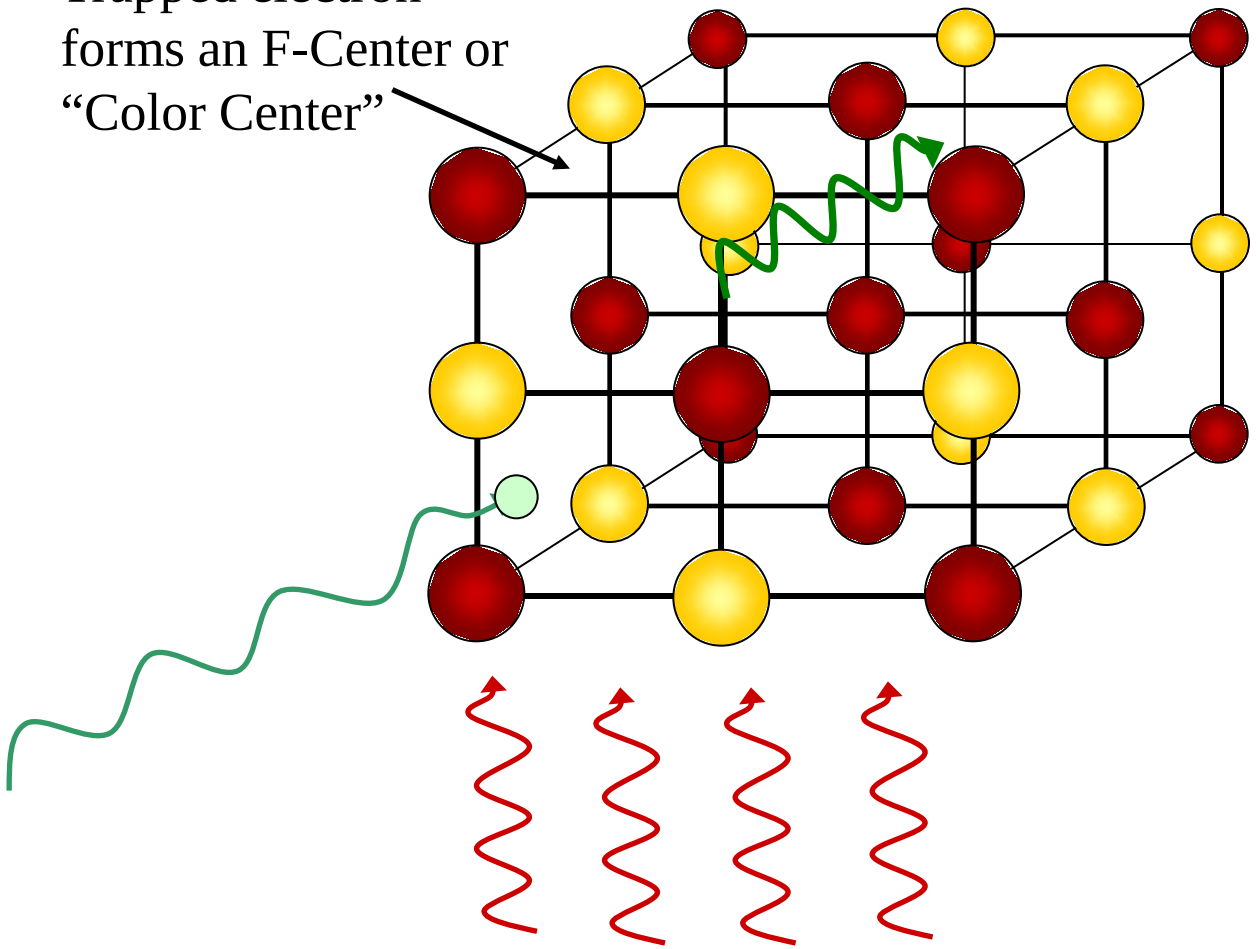
Cloud Chambers

http://www.youtube.com/watch?v=Efgy1bV2aQo



Thermo-Luminescence

Trapped electron forms an F-Center or "Color Center"



Energy of returning electron is released as light

Apply Heat

Credits/Reference

Wilson Cloud Chamber Slide

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Video – Large Diffusion Cloud Chamber

http://www.youtube.com/watch?v=Efgy1bV2aQo

Thermo-Luminescence animation

Ion Trail diagram for Cloud Chamber slide

Graduate Student – Danielle-Hauck during her Ph.D. research at Penn State University