

RADIOACTIVITY

HISTORICAL REVIEW; FUNDAMENTALS; ARTIFICIAL AND NATURAL

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LaRUC-Radon group
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Overview

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2. Introduction

GENERAL INFORMATION

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About me

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Education

B.Sc. in Physics

University of Valladolid
Valladolid, Spain

Sept. 1995 - Feb. 2002

PhD. in Physics

University of Valladolid
Valladolid, Spain

Mar. 2002 - Jul. 2008

Thesis entitled: Radon concentrations in air, soil and water in a granitic area: instrumental development and measurements

INTRODUCTION

Once upon a time ...

- X- rays
- Some materials emit radiation
- Wow ! we can penetrate our body



Once upon a time ...



Once upon a time ...



- Photographic plates can get dark in the presence of
ultraviolet light

Once upon a time ...

MARIE SKŁODOWSKA and PIERRE CURIE



Once upon a time ...

A wonderful marriage

- Marie: a physicist and mathematician but . . . a Polish Woman
- Pierre: professor of Physics in Paris
- Studies on pitchblende



Once upon a time ...

Their work with pitchblende

- They began separating elements and reducing sample's size
- They observe an increase on the intensity of emitted radiation
- They discovered **Polonium** in 1898

Once upon a time ...

Their work with pitchblende

- After separation of Plonium . . . emitted radiation increases more and more
- It must be another element different from Uranium and different from Radium. This element emits radiation too.

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 - Laboratory: a simple shed
 - From pitchblende to radium: years and years of hard work

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- ... the Radium
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 - Very poor materials and infrastructures to do the task
 - Laboratory: a simple shed
 - From pitchblende to radium: years and years of hard work
 - 10^3 kg pitchblende \Rightarrow few grams of radium

Once upon a time ...

Milestones

- 1903: Nobel prize on Physics: Marie, Pierre and Becquerel (15000 \$!!!)
- 1906: Pierre Curie passed away in a street accident in Paris on 19 April 1906 (*Crossing the busy Rue Dauphine in the rain at the Quai de Conti, he slipped and fell under a heavy horse-drawn cart. He died instantly when one of the wheels ran over his head, fracturing his skull (Wikipedia)*)
- 1911: Nobel prize on Chemistry: Marie Curie

Once upon a time ...



Once upon a time ...

Other names to bear in mind

- Ernest Rutherford
(1871 – 1937):
concept of
radioactive half-life;
model of the atom
- Sir James Chadwick
(1891 – 1974): the
discovery of the
neutron
- Frederick Soddy
(1877 – 1956):
radioactivity and
nuclear reactions
- Friedrich Ernst Dorn
(1848 – 1916): see
later ...
- Rolf Maximilian
Sievert (1896 – 1966):
biological effects of
radiation
- Max Karl Ernst
Ludwig Planck
(1858 – 1947):
quantum theory

Once upon a time ...



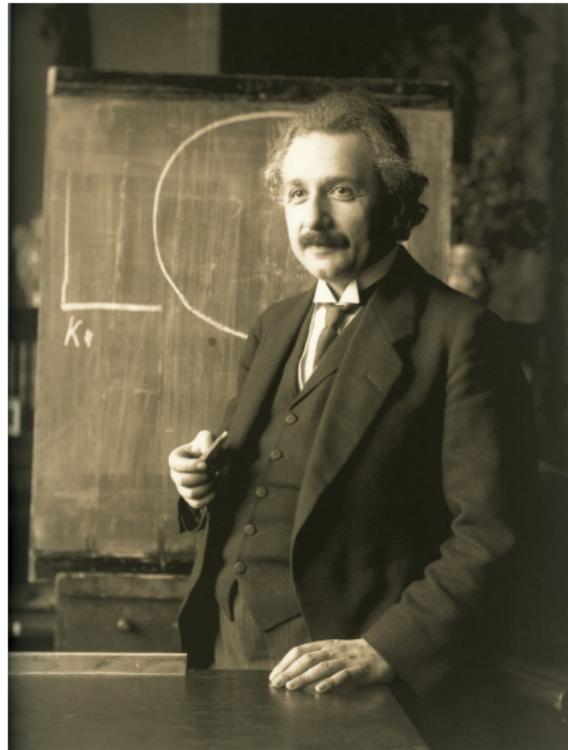
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Once upon a time ...



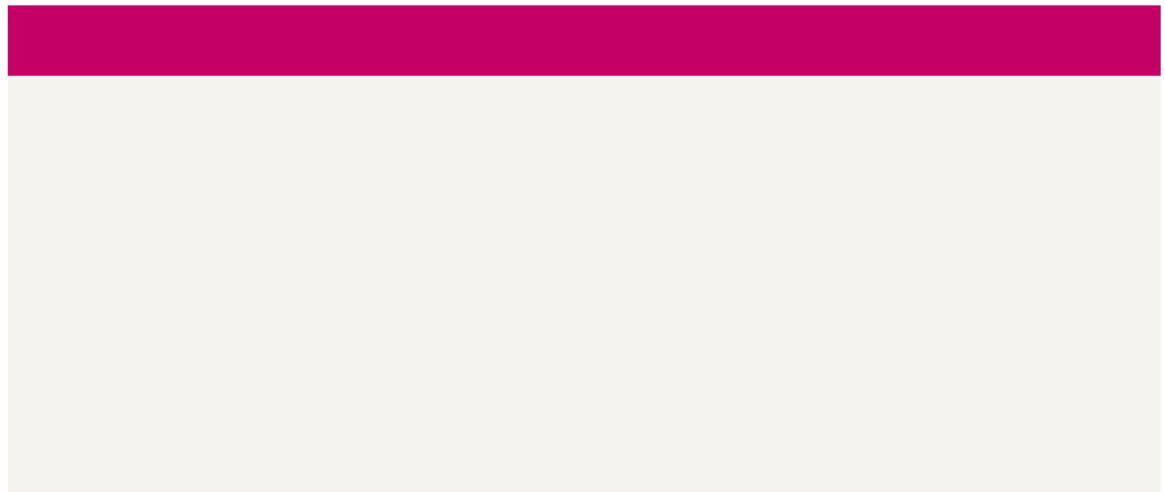
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Once upon a time ...



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Learnings so far



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Learnings so far

- Radioactivity: new phenomenon discovered at the end XIX century
- Curie: key name on the development of knowledge XX century
- The beginning of XX century gathered a fantastic pool of scientist as ever



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