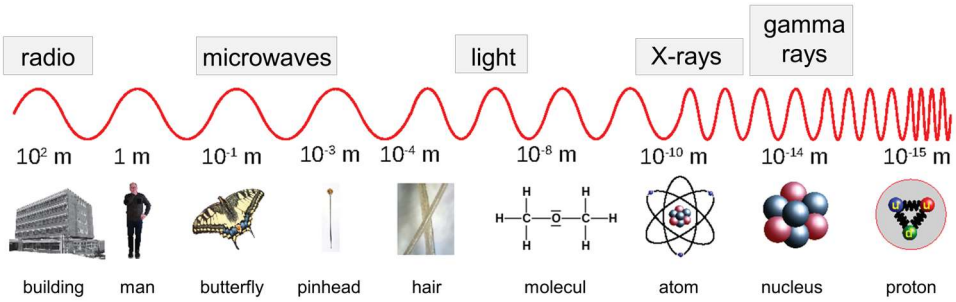
Radiation of the Year 2025
Gamma Radiation

Fachverband für Strahlenschutz e.V.
Für Deutschland und die Schweiz
Mitgliedsgesellschaft der IRPA
International Radiation Protection Association

Gamma radiation: Physics and origin

- a particularly penetrating electromagnetic radiation that indirectly ionizes
- is formed after the radioactive decay of an atomic nucleus, e.g. via alpha or beta decay



Electromagnetic spectrum
Wavelengths of some types of radiation
Comparison with other dimensions

Discovery of gamma radiation 125 years ago

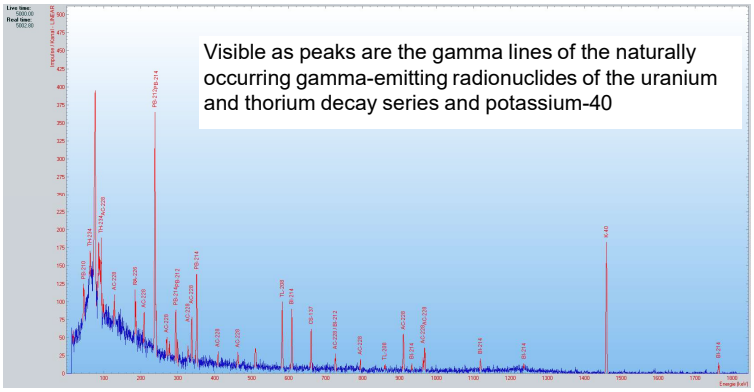
- discovered in 1900 by the French physicist and chemist Paul Ulrich Villard (1860 – 1934).
- while investigating the properties of radium, he found that there is a magnetically non-deflectable portion of the radiation emitted by radium
- this proportion could also penetrate aluminium and thin lead plates => new radiation ("similar to X-rays")
- correct interpretation of the results of his experiments by Villard
- however, the discovery was initially largely ignored by the scientific community
- it was not until 1903 that Ernest Rutherford named this new radiation as "gamma radiation“

Paul Ulrich Villard

Source: Archives de l'Académie des Sciences, Paris

Origin of natural gamma radiation

- decay of radionuclides in the soil
- cosmic radiation
- together represent an essential component of the radiation effect on humans



Gamma spectrum of a soil sample (HPGe detector, measurement: VKTA)

Application examples

- **Industry**
  welding inspection (gamma radiography), level measurement, sterilization of objects and products
- **Medicine**
  diagnostics, cancer therapy
- **Analysis**
  detection of radionuclides

Technical application – Gamma radiography device

The gamma emitters selenium-75 or iridium-192 are used for gamma radiography

Source: oserix.com

FS Working Group Radiation of the Year https://www.fs-ev.org/themen/radiation-of-the-year