# ★ BUBBLE MEMORY OR BUBBLE MEMORY DEVICES

★ **Introduction:** Bubble memory devices were primarily introduced by Andrew H. Bobeck of Bell Laboratories

★ **Definition:**

★ **Bubble memory** is a type of non-volatile memory that makes use of a thin film (layer) of magnetic material that holds small magnetized areas.

★ Bubble (also called as domain) stores 1-bit of data each.

★ The device which contains the bubble memory chip, magnetic field coils, and permanent magnets are called **bubble memory devices**.

★ A rotating magnetic field created by two mutually perpendicular coils causes the data in the form of magnetic bubbles to move serially through the magnetic field.

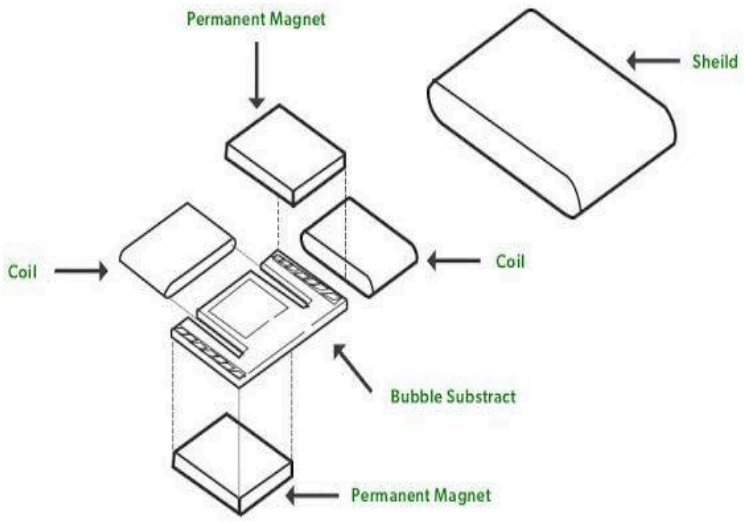
★ Permanent magnets provide non-volatility and allow for the stable existence of magnetic bubble domains.

★ **Construction:**

★ The chip is composed of a non-magnetic crystalline substrate upon which a thin crystalline magnetic epitaxial film is grown.

★ Magnetic bubble memory devices are designed by using magnetic materials like hexagonal ferrites, orthoferrites, synthetic garnets, and amorphous metal films.

★ The most used garnet substrate is **Gadolinium Gallium Garnet,** which supports the formation of small magnetic bubbles that allow high-density data storage.




Structure of bubble memory

## ★ Advantages of Bubble Memory:

★ It uses low power.

★ It has a high packing density.

★ It is more durable than disc memory.

★ It is rugged and non-volatile.

★ It is resistant to extreme temperatures, dust, humidity, and radiation.

## ★ Disadvantages of Bubble Memory:

★ Its manufacturing is expensive and complicated.

★ They are widely used as other memory devices such as ROM, EPROM.

## ★ Applications of Bubble Memory:

★ Bubble memory was used in data terminals, voice announcement systems, electronic switching systems, numerical control machines, robotics, and terminals.