# HOLOGRAphy

## HOLOGRAM TECHNOLOGY IN ARTISTIC PRACTICE

# What is a Hologram?

- A hologram projects a three dimensional image by reconstructing the light waves that were reflected from the origin

# When was holography invented?

- Dennis Gabor

- Born in Hungary

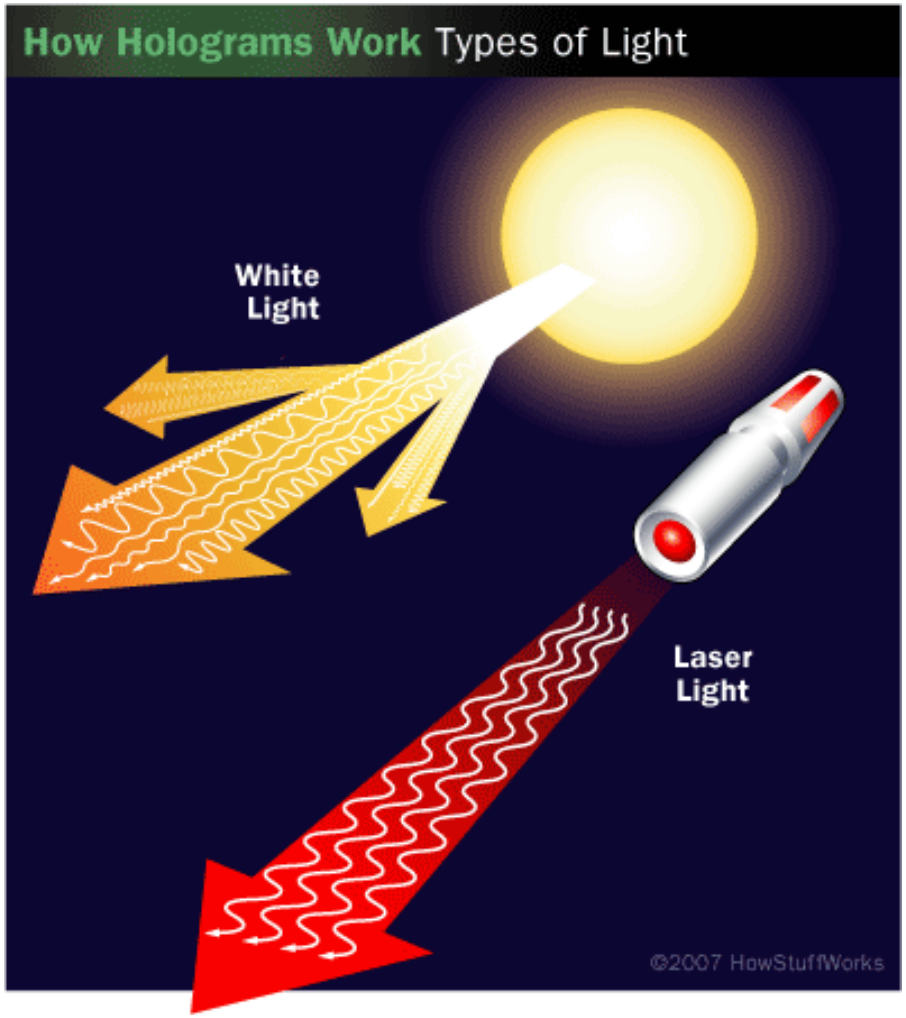
- Worked in Berlin, and Great Britain as electrical engineer, inventor and physicist

- Invented holography -1947

- Earliest “true” hologram not realized until 1964 (after invention of laser in 1960)

- Awarded Nobel Prize in Physics - 1971

# How Do They Work?




- The light waves of a laser beam are **coherent** – they have a polarized wave at a single frequency– as if they were all marching together in synchronized lines

- When a laser beam is split by reflecting it off a half-mirror, one half of the beam bounces off the mirror, hits the object, and reflects onto the photographic plate inside which the hologram will be created. This is called the **object beam.**

# How Do They Work?

- A hologram forms where the **object beam** and the **reference beam** meet up in the plate.

- Since the beams were originally one perfectly synchronized beam, recombining them shows how the light rays in the **object beam** have been changed compared to the **reference beam**.

- In other words, one beam separates into two beams, one of them changes because it hit an object, they recombine and compare differences, and the information is burned into a photographic plate

# Hologram Applications

- Holographic Data Storage

- Magnetic and optical data storage records information one bit at a time in a linear fashion

- Holographic storage can

# Hologram applications

- Holograms as Security


- Extremely difficult to forge as they are replicated from a master hologram
- Used often on passports, credit/bank cards and banknotes
- Classified into 3 different types depending on level of optical security:
  1. 2D/"3D" Hologram Images
  2. Dot Matrix
  3. Electron Beam Lithography

# Holograph

- There are many contemporary artists experimenting with **holography, including:**

**Ed Ruscha**

**James Turrell**

**Chuck Close**

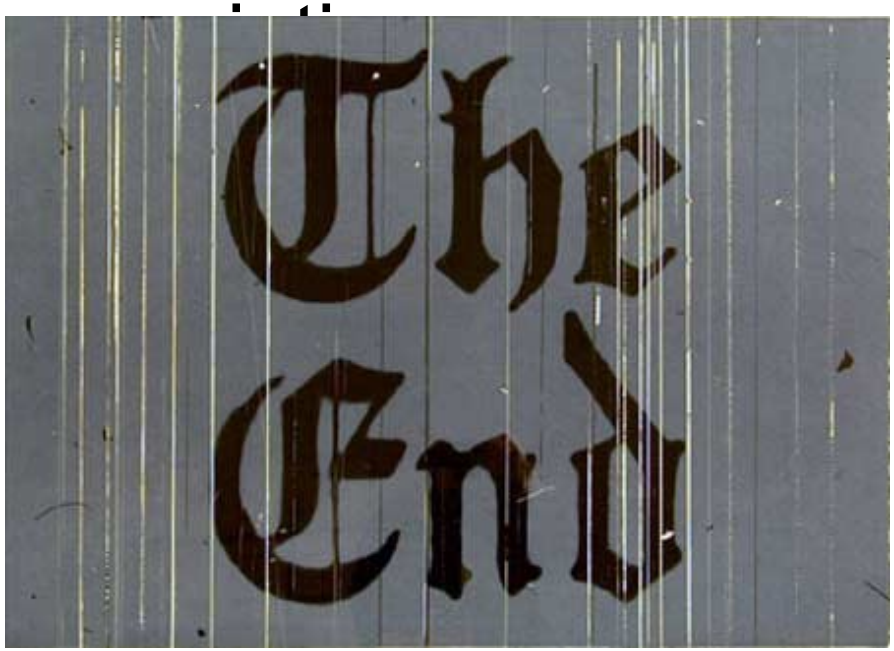
**Richard Hamilton**


There are also many artists producing holography inspired works:

The Flux Factory – “Holoscape”

# Ed Ruscha

- "The End" -



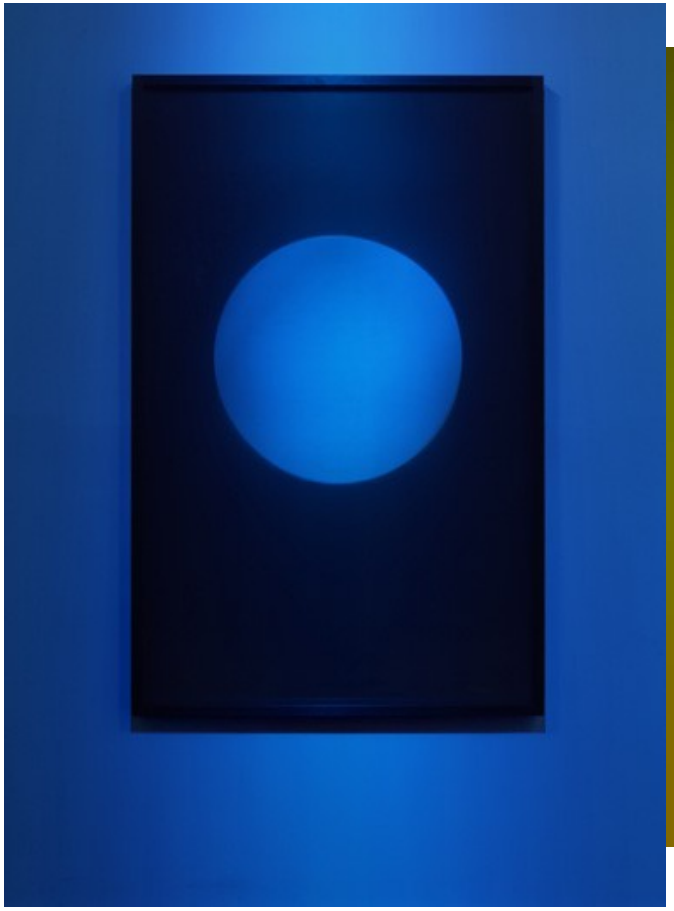

- Simulates frames of old scratched celluloid film, containing the words "The End" in Gothic letters

- Explores the significance of words and metaphorical meanings (romance of film

- "The End" -


- Experimenting with words floating in vaguely defined space

# James Turrell



**Large Holograms**

- Fifteen large-scale transmission light works – 5 to 6 feet
- Uses holography to examine the mass and physicality of light, reworking its transitory qualities and transformin
light itself into the object

# Chuck Close

- Works with the ideas of photorealism, exploration of the grid, portraiture, and the figure in space

Mark

Self Portrait – 4 Holograms

# Richard hamilton

- Major figure in the Pop Art movement
- His work often carries with it richly ambiguous, multiple readings
- Collaborated with Margaret Benyon in four holographic self-portraits

# Reference links

- http://science.howstuffworks.com/hologram.htm
- http://www.holocenter.org/home.html
- http://www.explainthatstuff.com/holograms.html
- http://www.moma.org/collection/artist.php?artist_id=2481
- http://en.wikipedia.org/wiki/Holography
- http://www.museum.cornell.edu/hfj/about/press_barron.html
- http://en.wikipedia.org/wiki/Chuck_Close