




"FOR THE GREATEST
BENEFIT TO HUMANKIND"

ALFRED NOBEL

P103 – Nobel Prizes in Physics
Discoveries that Revolutionized Science

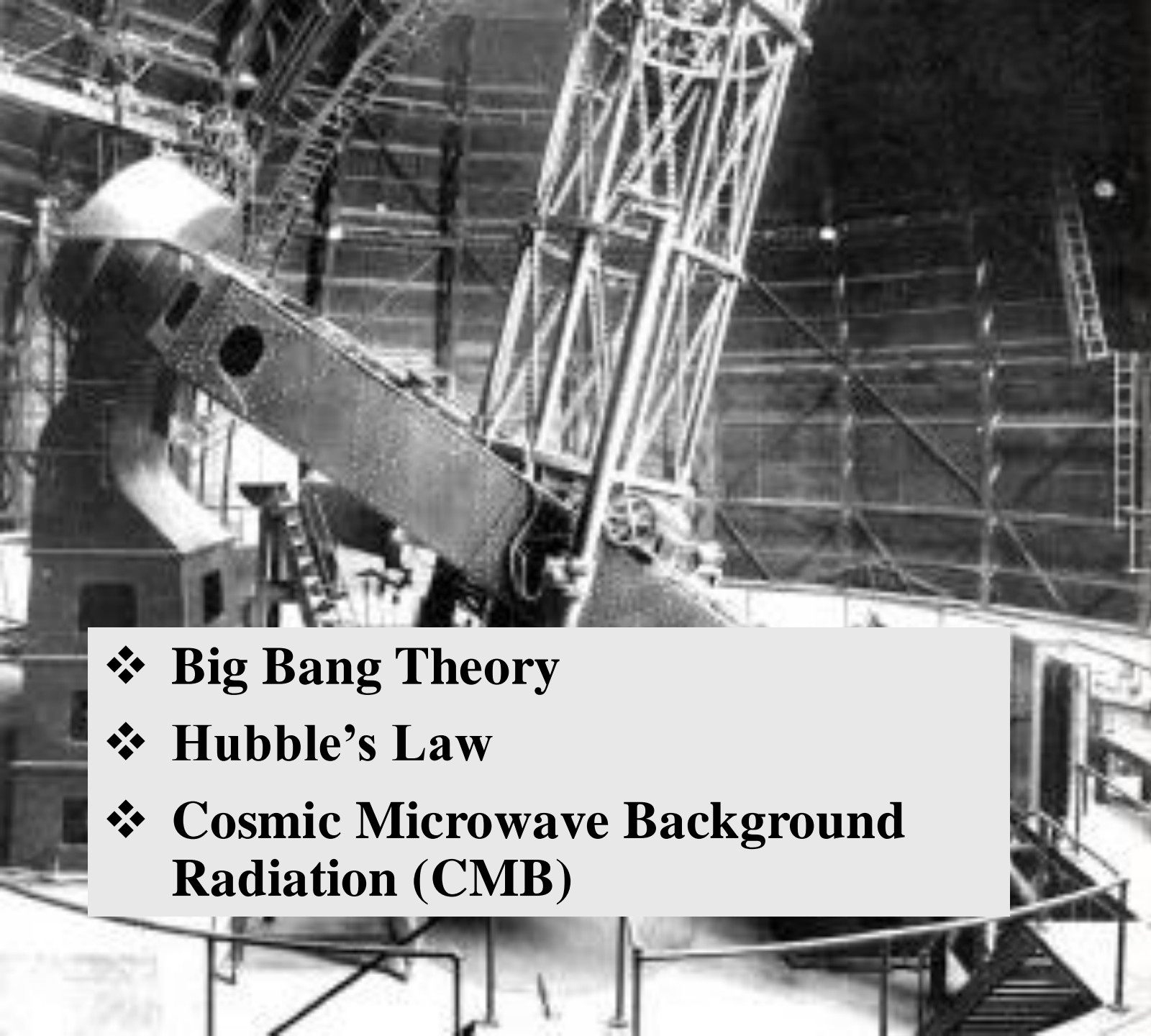
Dr. Nidhi Pant



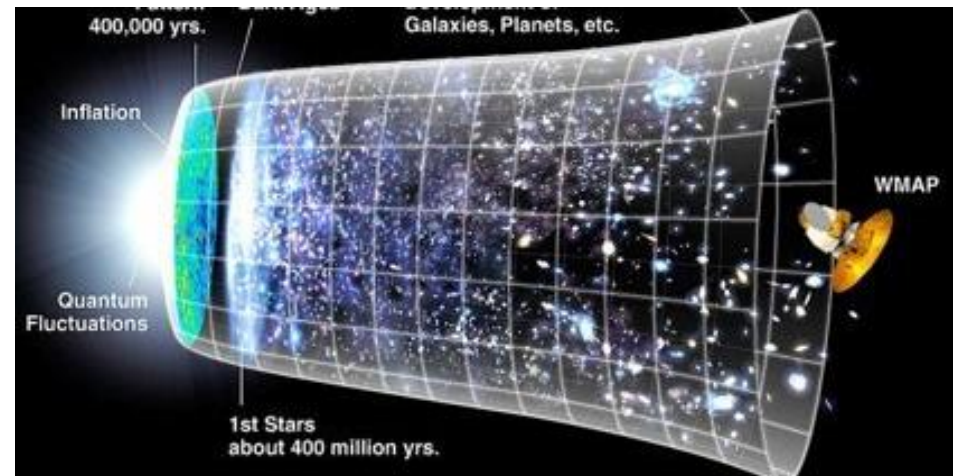
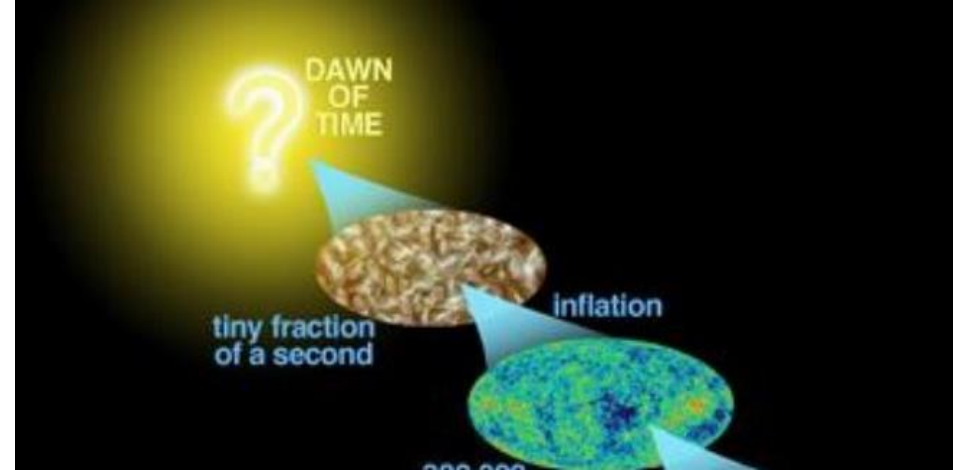
How did
the
universe
begin?

Cosmology

Cosmology is the science of exploring the Universe as a whole



- ❖ **Big Bang Theory**
- ❖ **Hubble's Law**
- ❖ **Cosmic Microwave Background Radiation (CMB)**



More data at further distance!

THE SCIENTIFIC MONTHLY

SEPTEMBER, 1931

30Mpc



Astronomy

" Without Astronomy, we know nothing of the place we occupy "

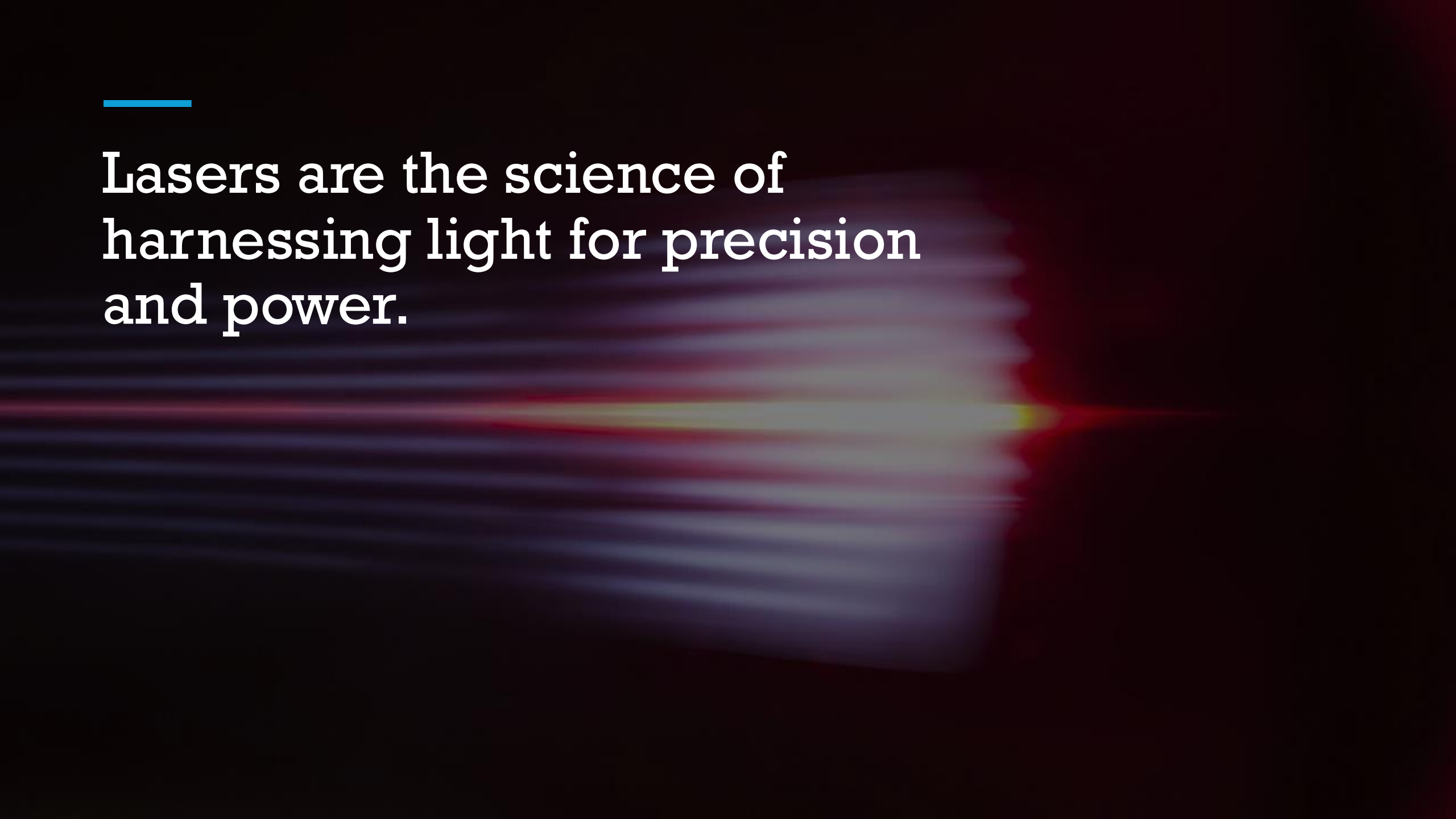
Aristotle

Revolutionizing our astronomy Understanding

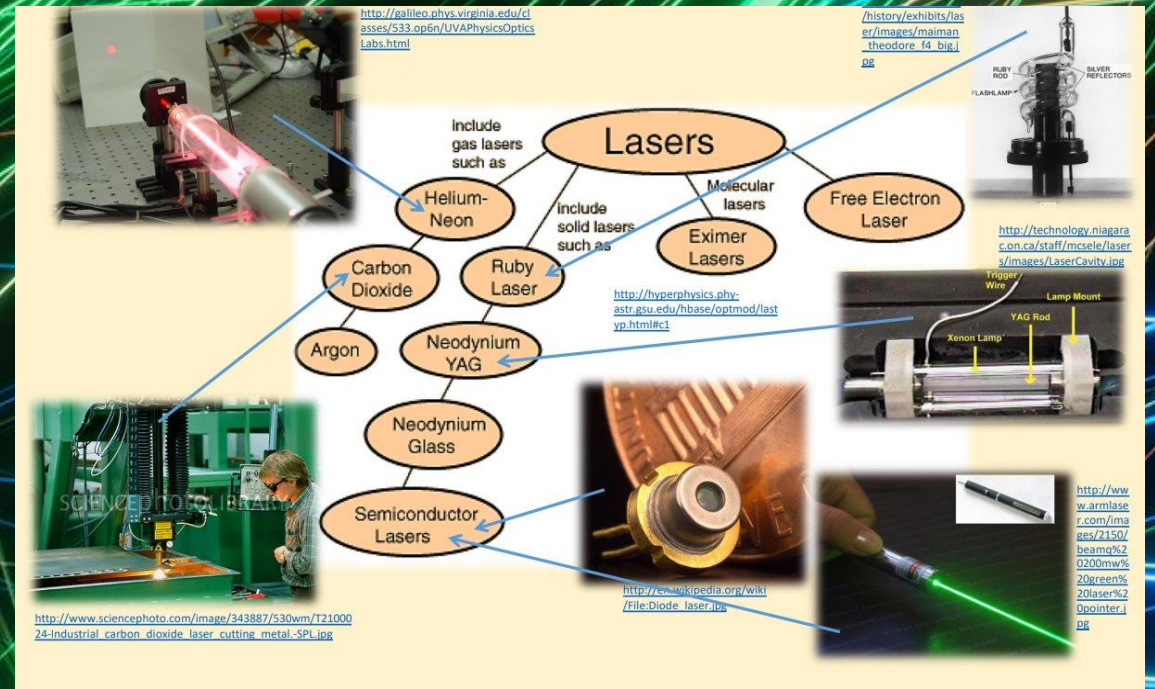
- ❖ **Stellar Evolution**
- ❖ **Radio and X-ray**
- ❖ **Supernovae**
- ❖ **Extrasolar planets**
- ❖ **Gravitational Waves**



Lasers are the science of harnessing light for precision and power.



Lasers



- ❖ Stimulated emission
- ❖ Lasing mechanism



Semiconductors are the science of mastering materials to drive modern technology.



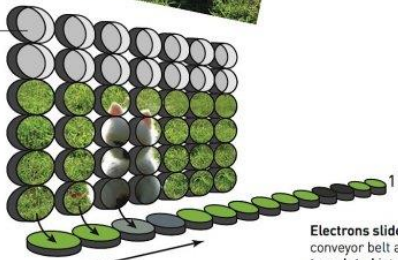
CCD



The image sensor, CCD, is the advanced digital camera's electronic eye.



Light particles displace electrons in the **photocells** and the cells act as small wells for the electrons. The more light, the more electrons are collected in the wells.

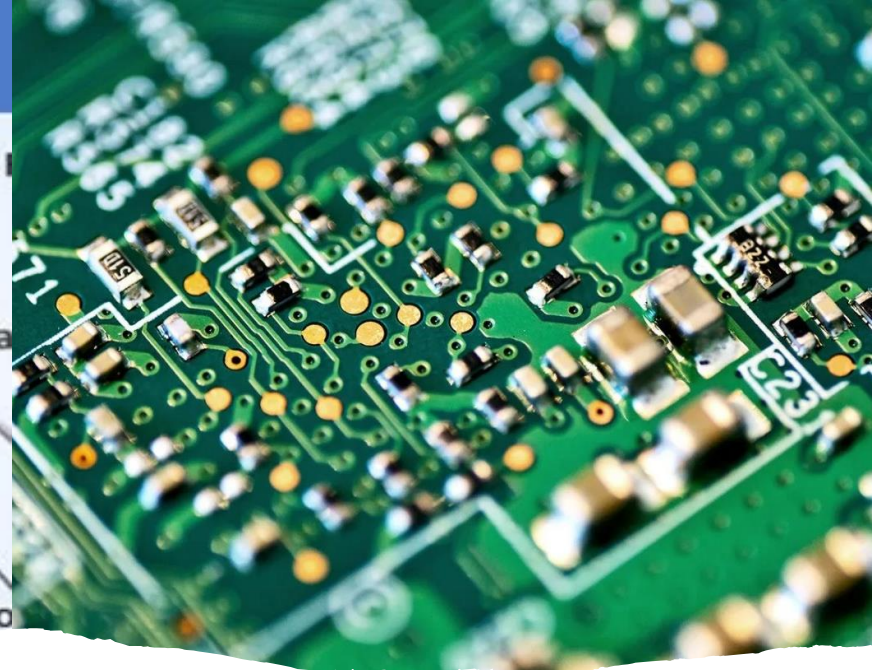
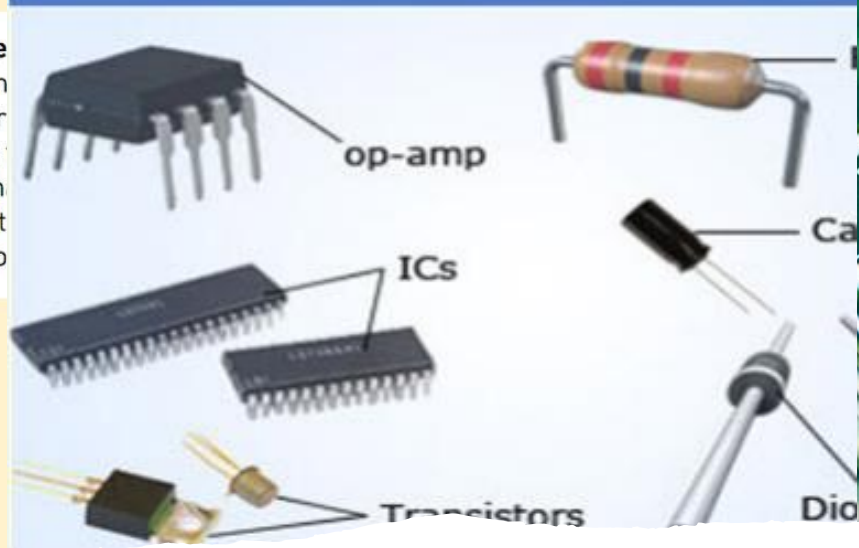


The CCD array is

Electrons slide off the array onto a conveyor belt and are subsequently translated into digital ones and zeros.

Figure 3. Digital image CCD, the electron image sensor, convert the optic image electronic signals that are translated into digital ones and zero

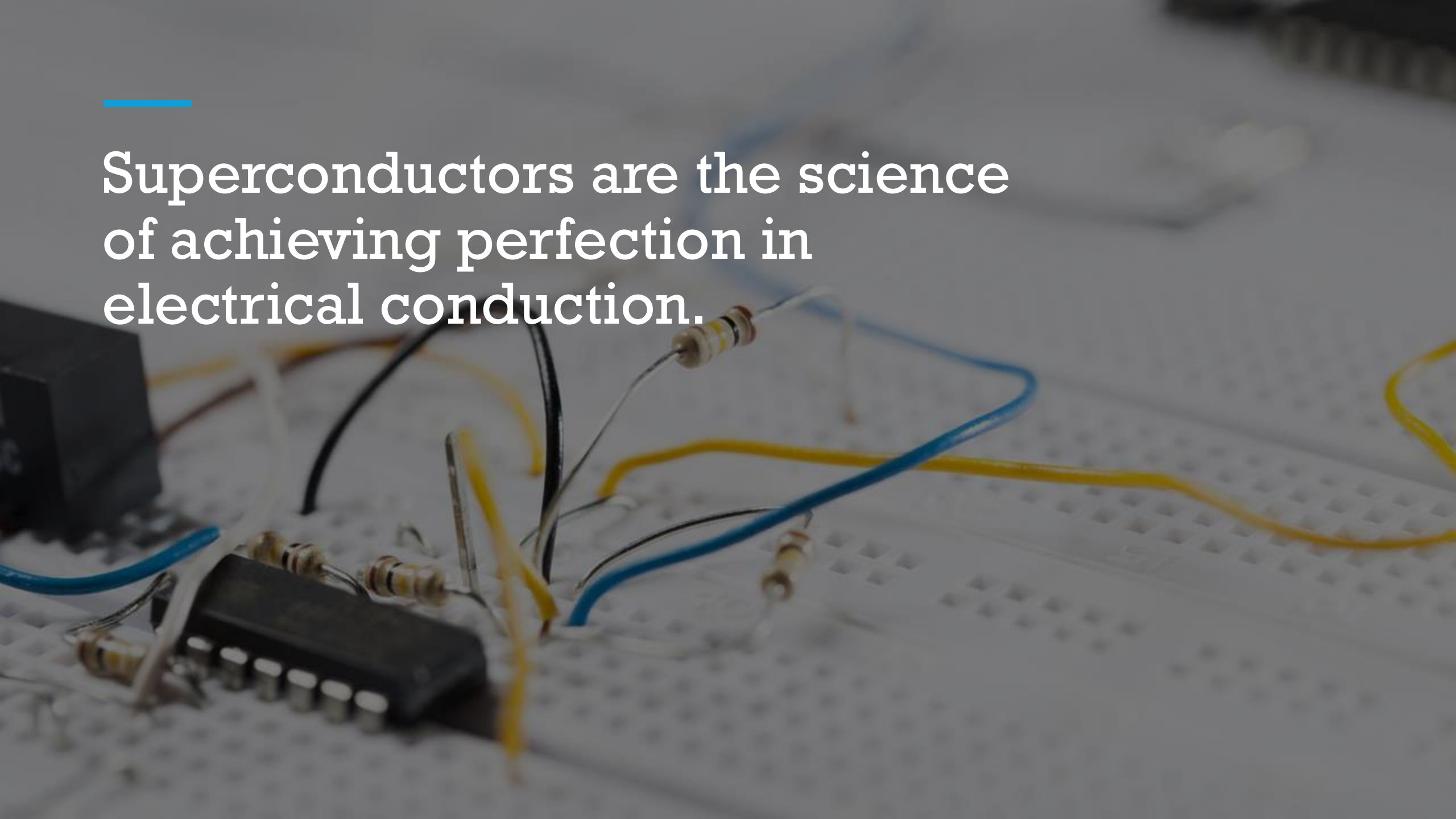
Semiconductor Devices



Semiconductors

- ❖ Transistors
- ❖ LEDs
- ❖ Integrated Circuits (IC)

Superconductors are the science of achieving perfection in electrical conduction.



Superconductors

❖ Superconductivity

❖ BCS Theory

❖ High-Temperature Superconductors

