

# Introduction

## Section 01

## History of Electricity



- Ancient Egyptian 2750 BC
  - shocks from electric fish
- Romans 1500 BC
  - shocks can travel in metals
- Thales 600 BC
  - rubbing amber makes magnet
- Arabs 1400
  - Identity of lightening
- William Gilbert 1600
  - wrong: it was Static Electricity

# History of Electricity



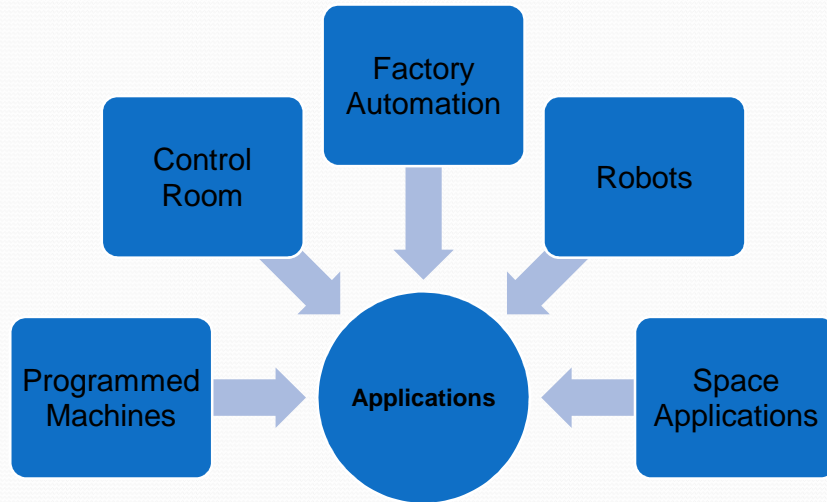
- Otto von Guericke 1700's
  - more work
- Benjamin Franklin 1752
  - lightening key experiment
- Luigi Galvani 1791
  - nerve cells passed signals to the muscles
- Alexander Volta 1800
  - Zinc and Copper Battery
- André-Marie Ampère 1820
  - electromagnetism

# History of Electricity



- Michael Faraday 1821
  - electric motor in 1821
- George Ohm 1827
  - ohm's law
- Tesla, Edison, Westinghouse, Siemens, 1900's
- Graham Bell and Kelvin
  - Second Industrial Revolution

# Applications



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# CNC Machines Control



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# Machines Monitoring



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# Fully Programmed Machines



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## Engraving



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## Control Rooms

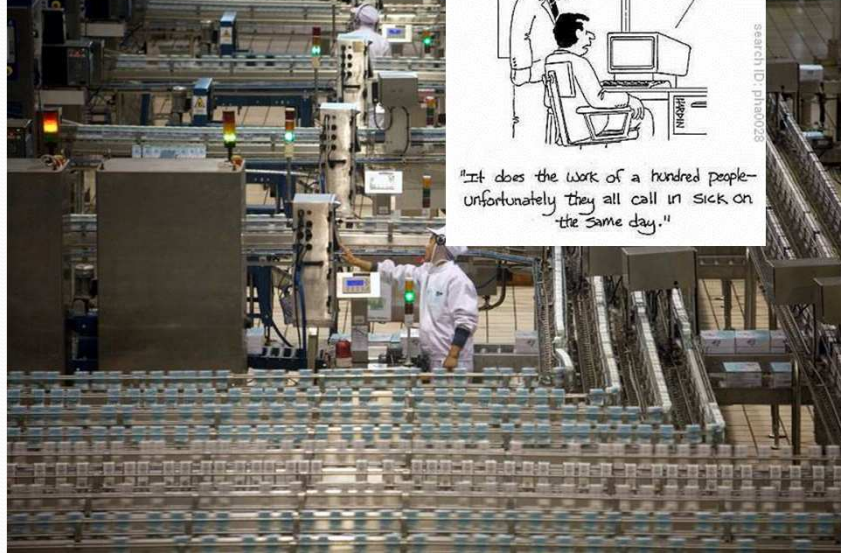


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# Automation



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# Robots



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# Accuracy



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# ExoMars Mission



Life in other planets!



17.7.2003  
23.34 - 23.37 UTC  
Petteri Kankaro, Turku, Finland

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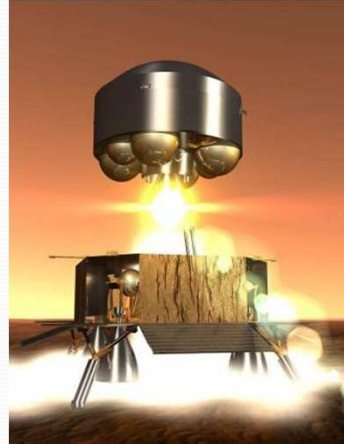
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# ExoMars Mission



- landing of a large payload on Mars
- navigation and operation of a mobile scientific platform
- a novel drill to obtain subsurface samples
- sample processing and distribution system
- protection and cleanliness levels

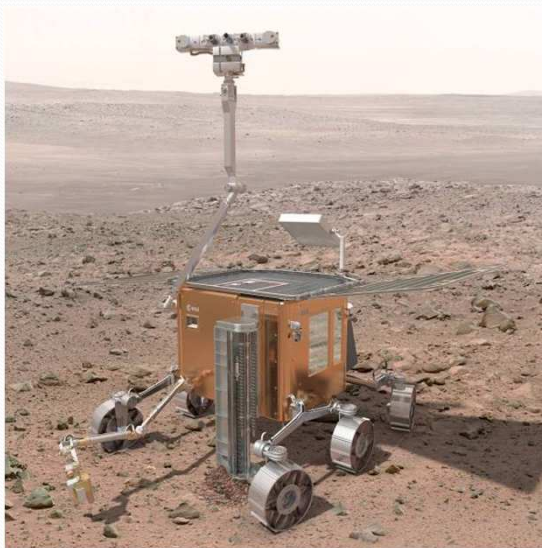


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# ExoMars Mission



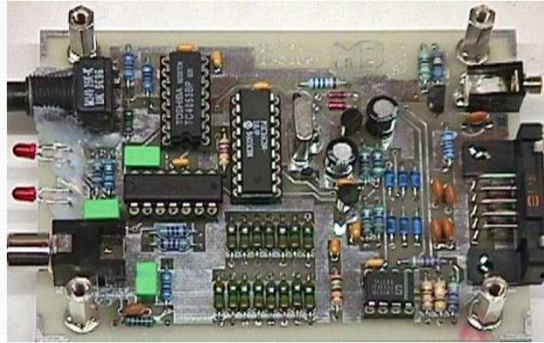
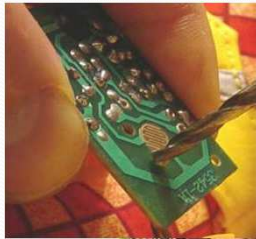
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# Printed Circuit Board (PCB)



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## Process Check



- Ask yourself..
- What do I need to know about EE?

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