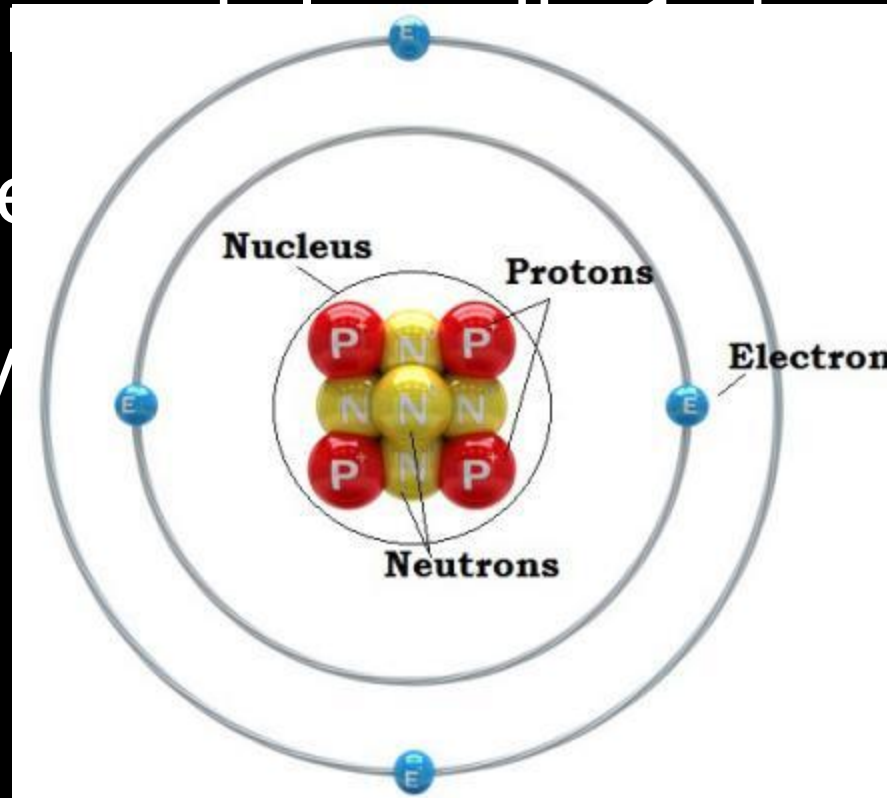


From Transistors to iPhone: Journey of the Electron

Enze Chen

Overview

- Subatomic particles with a charge
- Symbol: e^-
- electricity conductivity

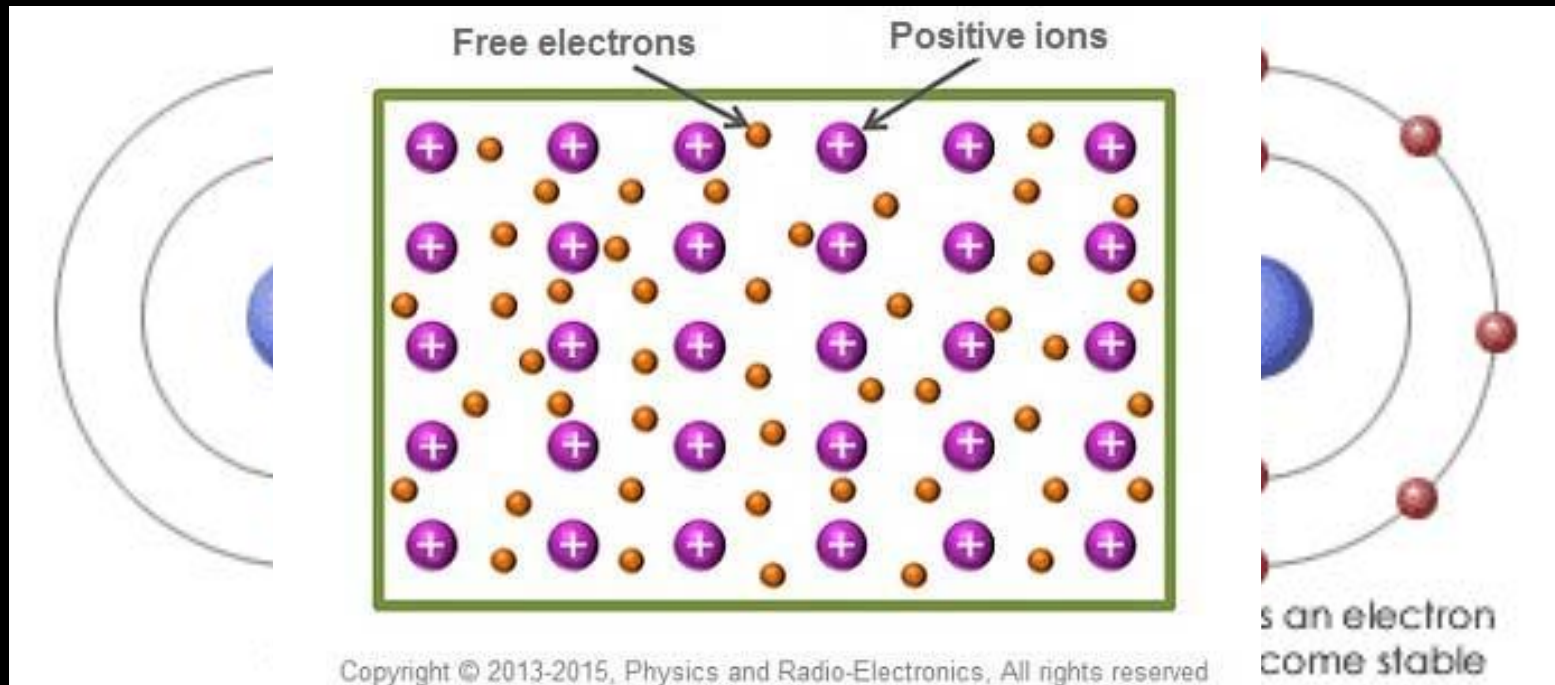


Discovery

- 1897 - J. J. Thomson's cathode rays
- 1911 - Millikan's oil-drop experiment
- Rutherford, Pauli, De Broglie, Schrödinger

Chemical Bonds

- Electron transfer!



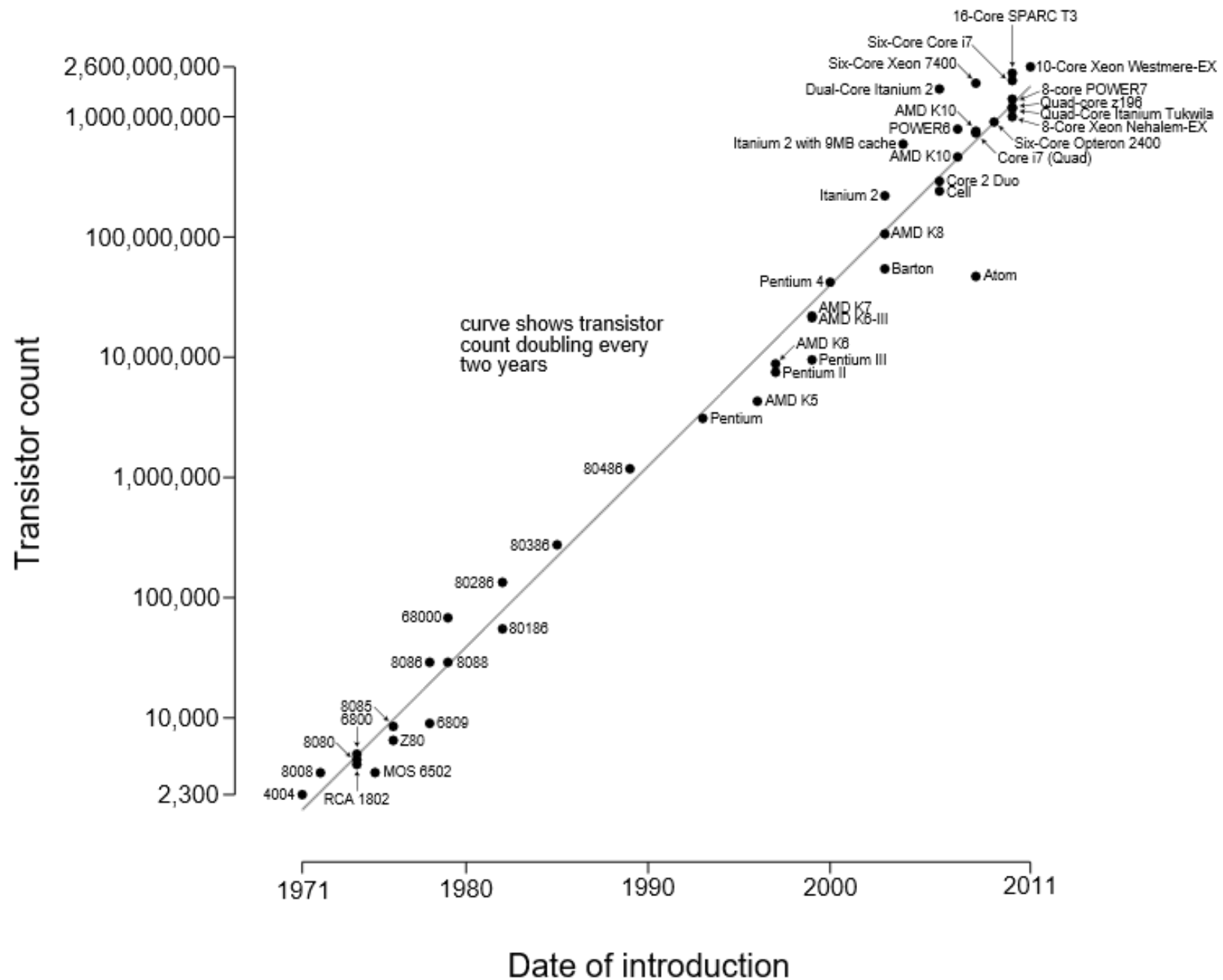
Applications

- Conductivity (electricity, heat)
 - Semiconductor
 - Tra
 - Inte
-
- Carbon family

Carbon family ←

The image is a composite of three parts. On the left is a standard periodic table with elements color-coded by groups: Group 1 (pink), Group 2 (yellow), Groups 3-10 (green), Group 11 (cyan), Group 12 (blue), Groups 13-16 (purple), Group 17 (orange), and Group 18 (grey). On the right is a close-up of the top right corner of the periodic table, showing elements from Boron (5) to Xenon (54). A red box highlights element 14, Silicon (Si), and a red arrow points from the text 'Carbon family' to it. Below the periodic table is a close-up of two integrated circuits (chips) with pins, one of which is labeled 'HC-14068E' and 'MALAYSIAN'.

Microprocessor Transistor Counts 1971-2011 & Moore's Law



Devices galore!



Questions?