

From basic solid state research to application (Prof. Franke)
Seminar talk by Finn Müller-Hansen on May 28, 2013

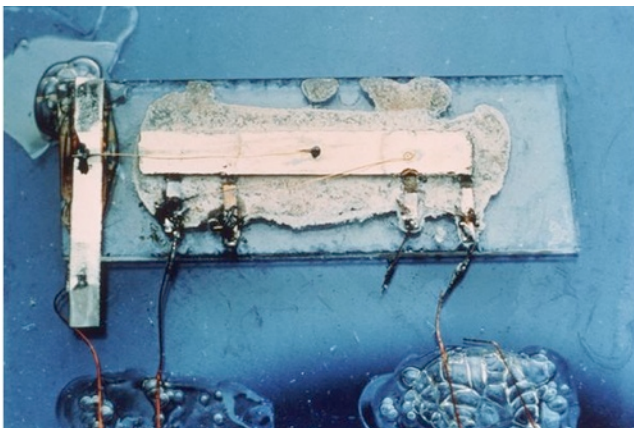
Integrated circuits: From simple transistors to modern microelectronics

Abstract:

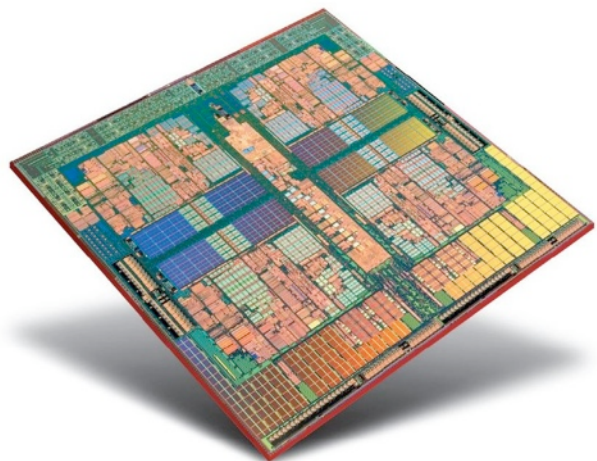
Over the past 60 years, silicon based semiconductor technology has developed very rapidly. Today, it forms the backbone of a major part of economic, cultural and scientific activity worldwide.

The first part of the talk shows from a historical perspective the development from basic transistors to highly complex integrated circuits. With the invention of the transistor by Shockley, Bardeen and Brattain a revolution in electronic circuits started which led to the first integrated circuits built by Kilby and Noyce. Since then integrated circuits have grown exponentially in complexity and performance.

The second part of the talk gives an introduction to the physical principals underlying semiconductor technology. The goal is to give a basic understanding of the functioning and manufacturing of integrated circuits. Therefore the talk presents basics of digital logic and chip design as well as fabrication methods such as lithography. To conclude the talk refers to possible future developments in integrated circuit technology.



The first integrated circuit built by Jack Kilby in 1958 (www.ti.com)



Modern microprocessor (www.amd.com)