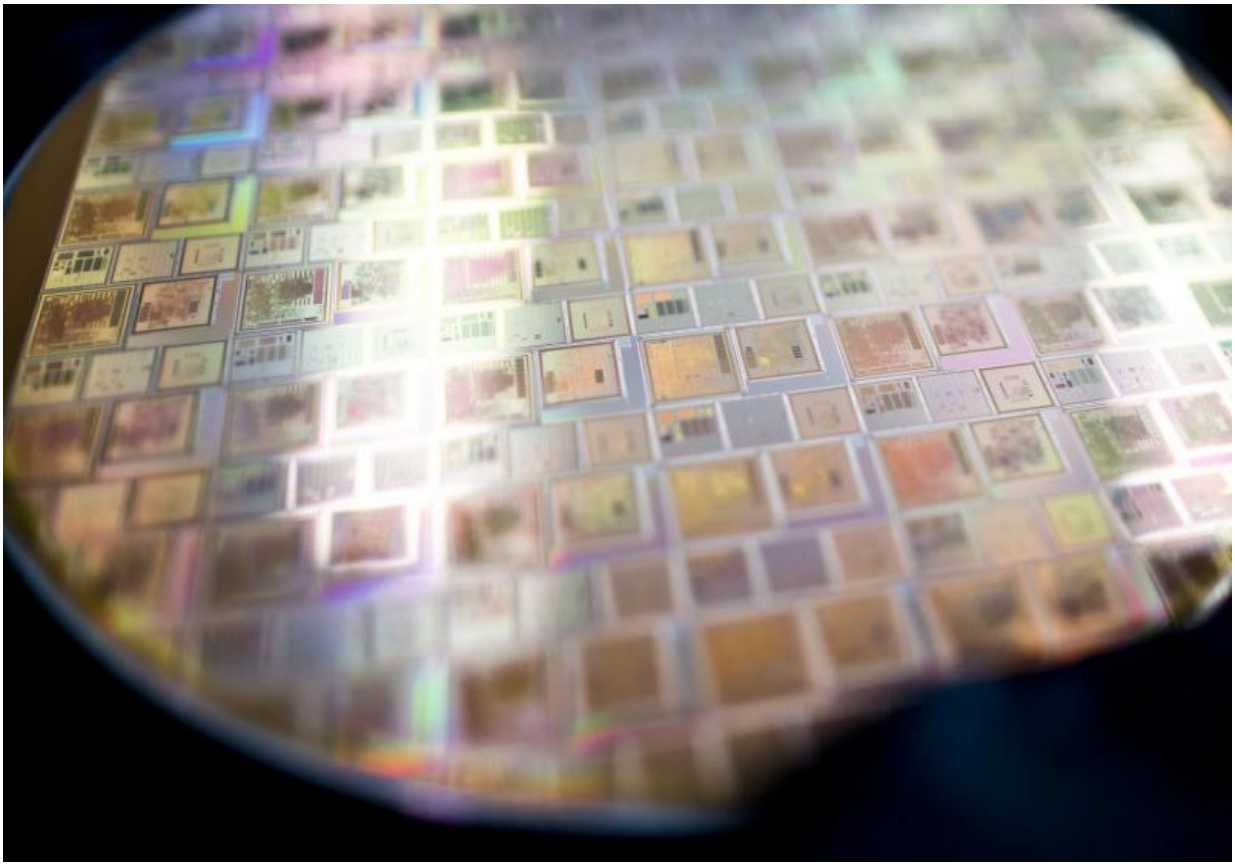
# Image: Integrated circuits on silicon

June 9 2016



Credit: ESA-Guus Schoonewille

Multiple integrated circuits at the heart of Europe's space missions, etched together onto a single piece of silicon.

This 20 cm-diameter wafer contains 35 replicas of five different space

chips, each incorporating up to about 10 million transistors or basic circuit switches.

Laid down within a microchip, these designs endow a space mission with the ability to perform various specialised tasks such as data handling, communications processing or attitude control.

To save money on the high cost of fabrication, various chips designed by different companies and destined for multiple ESA projects are crammed onto the same silicon wafers, etched into place at specialised semiconductor manufacturing plants.

Once tested for functionality, the chips on the wafer are chopped up and packaged for use, then mounted on printed circuit boards for connection with other microelectronic components aboard a satellite.

Since 2002, ESA's Microelectronics section has maintained a catalogue of 'building blocks' for chip designs, known as Intellectual Property cores, available to European industry through ESA licence. For more information, check here.

Provided by European Space Agency