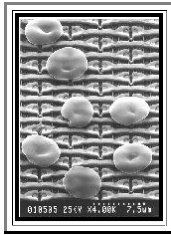


Particles on Chips

Illustration

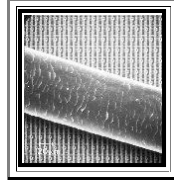
Here you can see a collection of **SEM** pictures which not only illustrate graphically the "particle" problem in making chips, but also have a certain esthetical appeal

Click on the link for an enlarged view.



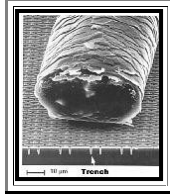
Red blood cells on a **1 Mbit** memory

[\(large size\)](#)



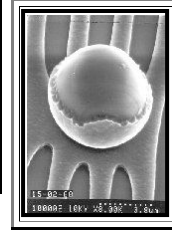
Hair (from a female) on a **256 kbit** memory chip. Just one of the little flakes of the hair would be enough to cover one memory cell.

[\(large size\)](#)



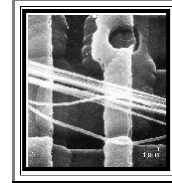
Hair on a **4Mbit** memory chip. - just to show how structure sizes decrease.

[\(large size\)](#)



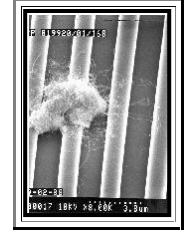
Here a metal particle, probably a tiny drop of **Al** that was burnt off by a electrical discharge in a sputtering machine and hit the **Si** as a solidified droplet . It was coated with **Al** which was subsequently structured by etching. Four conducting lines are now short circuited.

[\(large size\)](#)



Mother nature is still ahead when it comes to small structures. Here we see spiderwebs on a **256 k DRAM**. A typical strand of spider silk consists of several individual strings with diameters around **0.2 μm**.

[\(large size\)](#)



Here is a particle of unknown nature. Whatever it is, it will kill a chip.

[\(large size\)](#)