HRTEM of Gateoxide and ONO

- Here are two *HRTEM* pictures of "gate" dielectrics form around **1990** from the Siemens Laboratories in Munich. It is actually not the gate dielectric in these pictures, but the dielectric in the <u>capacitor</u> of a *DRAM* memory cell. The properties of this oxide are just as critical as under the gate of a transistor.
- The one on the left show the "conventional" single layer of SiO₂ that was grown by thermal oxidation.
- The picture on the right shows "**ONO**". Here the first oxide is grown by thermal oxidation of the substrate wafer, the nitride is deposited by <u>CVD</u>, and the top oxide layer is produced by oxidizing the nitride.

