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Oxide Nanoelectronics On Demand[1]

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Electronic confinement at nanoscale dimensions remains a central means of science and technology. I will demonstrate nanoscale lateral confinement of a quasi-two-dimensional electron gas at the $LaAlO_3/SrTiO_3$ interface and show how it can be exploited to create a variety of electronic devices. Using a conducting AFM probe it is possible to create tunnel junctions and field-effect transistors (FETs) with feature sizes comparable to the diameter of a single-wall nanotube. These devices can be modified or erased without complex or irreversible lithographic procedures. This new, on-demand nanoelectronics platform has the potential for widespread technological application.

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