

Abstract Submitted
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BaTiO₃/GaAs heterostructures: a possible route to reconfigurable III-V nanoelectronics¹ DONGYUE YANG, GIRIRAJ JNAWALI, LU CHENG, FENG BI, PATRICK IRVIN, JEREMY LEVY, University of Pittsburgh, BORZOYEH SHOJAEI, CHRIS PALMSTROM, University of California Santa Barbara, ROCIO CONTRERAS-GUERRERO, RAVI DROOPAD, Texas State University — Ferroelectric field effect device concepts have existed since the early days of the transistor.² The challenges have been more materials-based rather than conceptual. Recent advances in oxide-molecular-beam epitaxy have allowed high quality interfaces between complex oxides and compound semiconductors. Here we focus on heterostructures between GaAs and BaTiO₃, which are well lattice-matched and have atomically sharp interfaces. These structures can be configured both in the III-V layer, by growing GaAs/AlGaAs heterostructures and quantum wells; and they can be ferroelectrically patterned in the BaTiO₃ layer using a scanning probe microscope. We discuss current efforts to develop this material for both optical and transport-based experiments.

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²J. F. Scott, *Ferroelectric Memories*, Springer-Verlag, Berlin **2000**

Dongyue Yang
University of Pittsburgh

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