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Rewritable nanoscale photodetector at the $LaAlO_3$/ $SrTiO_3$ interface YANJUN MA, PATRICK IRVIN, DANIELA BOGORIN, CHENG CEN, JEREMY LEVY, University of Pittsburgh — It has been demonstrated by Cen. et al that a conducting nanowire can be written or erased at the interface between $LaAlO_3$ and $SrTiO_3$, using a conducting AFM writing technique.[1,2] We show two-terminal and three-terminal junctions can behave as nanoscale photodetectors. Two-terminal nanowire junctions and three-terminal SketchFETs are excited locally with visible-IR light, and the photoconductive response is measured as a function of position and wavelength. The spatial sensitivity appears to be diffraction-limited, and the photoconductive response extends into the NIR. Both the mechanism and possible applications for this class of devices will be discussed.

[1]C. Cen, S. Thiel, K. E. Andersen, C. S. Hellberg, J. Mannhart, and J. Levy, Nature Materials **7**, 2136 (2008).
[2]C. Cen, S. Thiel, J. Mannhart, and J. Levy, Science **323**, 1026 (2009).

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