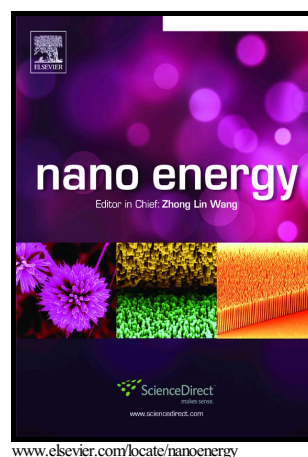


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ABSTRACT

Optically stimulated synaptic devices are critical to the development of neuromorphic computing with broad bandwidth and efficient interconnect. Although a few interesting materials have been employed to fabricate optically stimulated synaptic devices, the use of silicon (Si) that is the material of choice for very large-scale integration circuits in the conventional von Neumann computing has not been explored for optically stimulated synaptic devices. Here we take advantage of one of the most important nanostructures of Si — Si nanocrystals (NCs) to make synaptic devices, which can be effectively stimulated by light in the unprecedented broad spectral region from the ultraviolet to near-infrared, approaching the wavelength of $\sim 2 \mu\text{m}$. These optically

¹ These authors contributed equally to this work.

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