

## **A SnS<sub>2</sub>-based photomemristor driven by sun**

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### **Abstract**

We demonstrate experimentally that a sample of a SnS<sub>2</sub> layered semiconductor compound with the area of 1 cm<sup>2</sup> and the thickness of 100 μm, contacted laterally by silver electrodes with the area of 1 mm<sup>2</sup>, acts naturally as a memristor device when illuminated by a sun simulator. Although the conductance of the device changes with the number of pulses or voltages sweeps, the current-voltage dependence is almost linear, showing only a very narrow but clearly pinched hysteresis, which is the main imprint of a memristor. This SnS<sub>2</sub>-based solid-state miniaturized photomemristor could be used for the implementation of all-optical neuromorphic circuits based on artificial neurons and synapses, oriented to learning algorithms of living organisms.