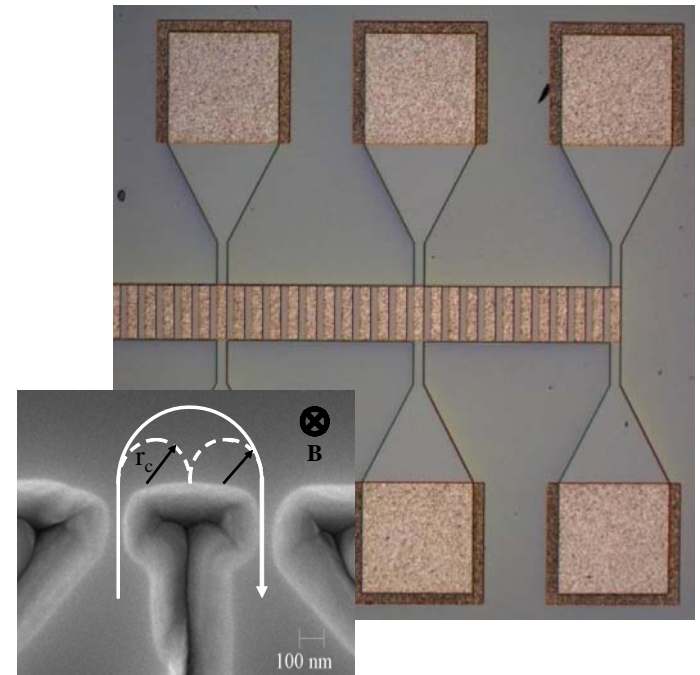


CSPIN IRG2, Univ. of Oklahoma and Univ. of Arkansas, [DMR-0520550](#)

Semiconductors with narrow energy gaps have electronic properties, including a high mobility and strong spin-orbit coupling, that are advantageous for electronic device applications. The switching speed of a field-effect transistor and the sensitivity of a geometrical magnetoresistor are improved by a high carrier mobility. In addition to these traditional devices, we are studying devices that take advantage of quantum-mechanical or spin-orbit effects. We are also exploring the properties of holes in  $\text{InSb}$  and  $\text{In}_x\text{Ga}_{1-x}\text{As}$  quantum wells, which are predicted to have stronger spin-orbit effects than electrons and would be required for CMOS logic applications.



Narrow gap semiconductors improve the performance of traditional electronic devices, including the geometrical magnetoresistor shown in the larger image, and quantum-mechanical devices, including the electron focusing device shown in the smaller image.