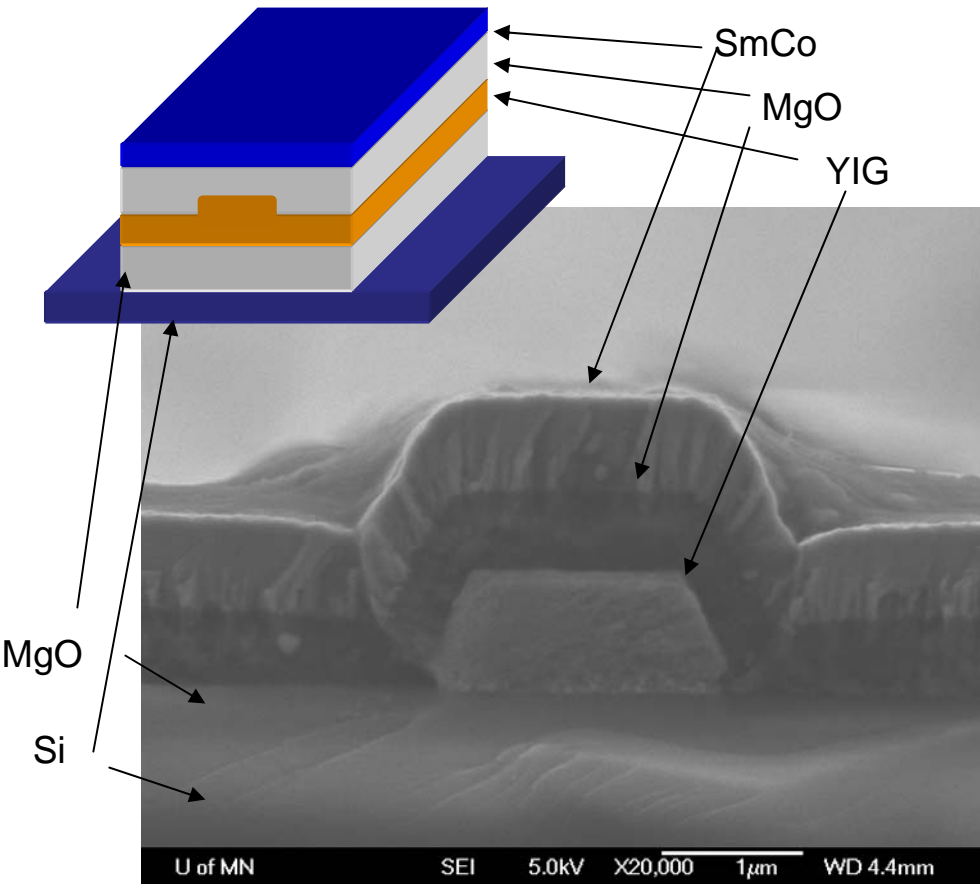


# Fully Integrated Optical Isolators

Sang-Yeob Sung, Xiaoyuan Qi, Samir Mondal, Bethanie J.H. Stadler (PI)  
Electrical & Computer Engineering, University of Minnesota



Schematic and side view of integrated ridge waveguide optical isolator.

- Magneto-optical waveguides ( $\text{Y}_3\text{Fe}_5\text{O}_{12}$ ) with smooth edges have been successfully grown on semiconductor substrates without thermal cracking.
- This is the first demonstration of integrated YIG waveguides with excellent optical properties on semiconductors.
- Birefringence, which inhibits Faraday rotation was substantially reduced by varying the waveguide's cross-sectional shape and dimensions.
- A SmCo thin film permanent magnetic was deposited on top of yttrium-iron-garnet (YIG)/ MgO optical cladding layer to bias on magneto-optical layer.

A photonic crystal polarizer completes integration of Isolators

