

## Photonic crystals with ring-shaped holes

A. Säynätjoki<sup>1</sup>, M. Mulo<sup>1,2</sup>, S. Arpiainen<sup>2</sup>, J. Ahopelto<sup>2</sup>, and H. Lipsanen<sup>1</sup>

<sup>1</sup>Micro and Nanosciences Laboratory, Helsinki University of Technology,  
P.O.Box 3500, FIN-02015 HUT, Finland

<sup>2</sup>VTT Information Technology, Micronova, P.O. Box 1208, FIN-02044 VTT, Finland

Lattices of circular holes are the dominating geometries of 2D photonic crystals (PhCs). However, PhCs with ring-shaped holes (RPhCs, see Fig. 1) are faster to write with electron beam lithography than circular holes, and provide one extra design parameter to tailor the photonic band structure. Moreover, the larger sidewall surface and the larger sensitivity to refractive index variations make RPhCs interesting for optical switching and sensing applications. We will compare RPhCs to conventional PhCs in terms of gap width, mirror reflectivity, tunability and waveguide dispersion. We will also present experimental data on RPhC waveguide transmission.

The authors would like to acknowledge the financial support from the Finnish Academy (TULE-project PHC-OPTICS) and from the European Union (EU IST-510162 project PHAT).

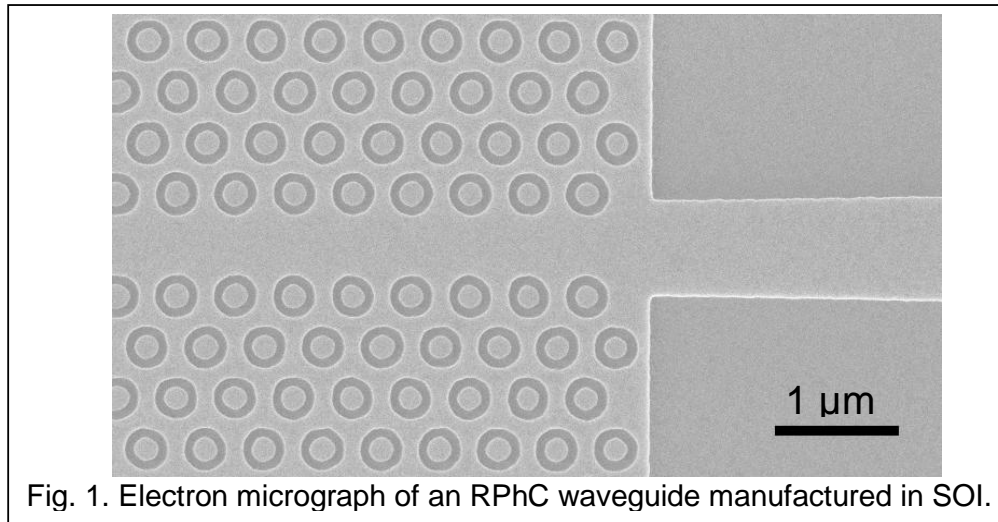


Fig. 1. Electron micrograph of an RPhC waveguide manufactured in SOI.