Focused ion beam for Photonics: 
A new versatile fabrication method
Jonathan Schrauwen, Dries Van Thourhout, Roel Baets
mailto:Jonathan.Schrauwen@intec.ugent.be

Idea

Nanophotonics:
• Difficult to design (3D simulation)
• Nanometer fabrication precision required

Problem

Lithography:
Even best and most expensive tools
do not reach < 30nm resolution

Focused ion beam:
• < 20nm resolution
• Fast and cheap prototyping
• 3D fabrication

Solution

• Protective mask
• Etch enhancement gasses

Successful fabrication of grating couplers for light
coupling between optical chip and fiber

Si + I₂ → SiI₂
Chemical reaction with iodine increases etch rate
and causes less ion implantation en crystal damage

Outlook

• Recrystallization of Si and out-diffusion of Ga ions by
  annealing at high temperatures (> 800°C)
• Application of similar processes to III-V semiconductors