



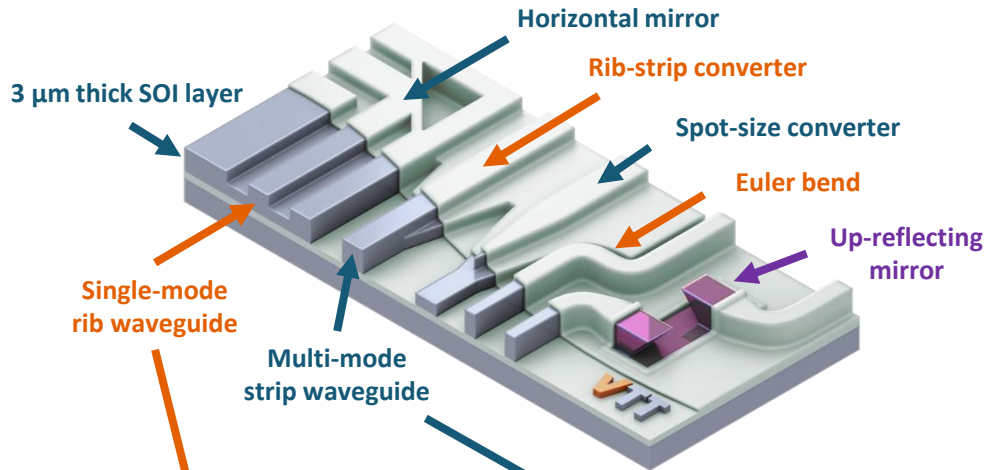
# VTT Si-photonic tech. on 3 $\mu$ m SOI platform

Matteo Cherchi

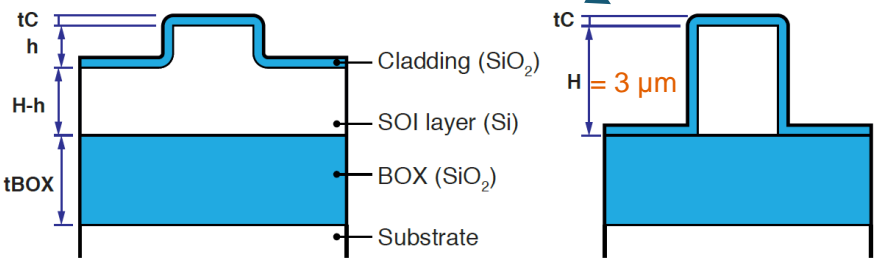
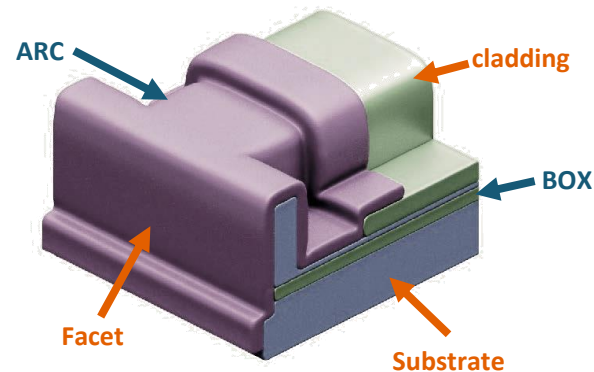
CMP Annual Users Meeting – Paris 30/01/2020

# Overview of thick SOI

Platform overview

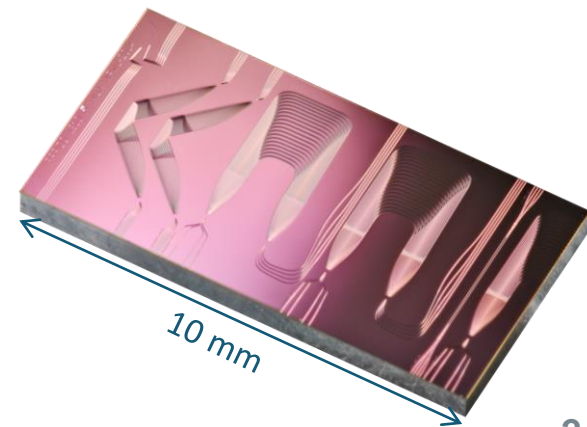
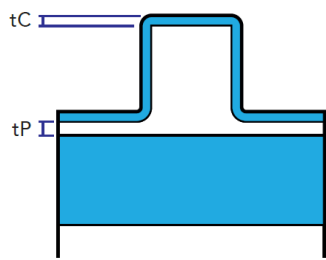


Actual facet with T-bar



Waveguide cross-sections

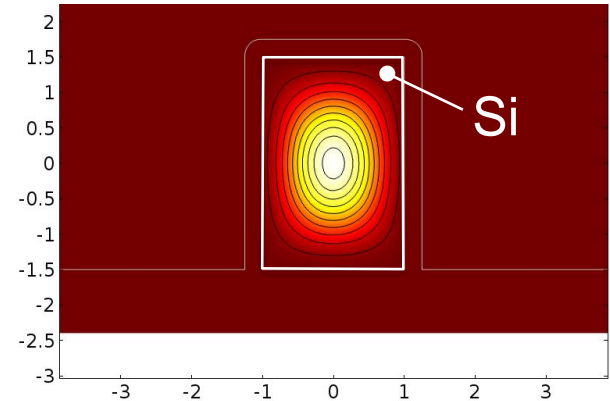
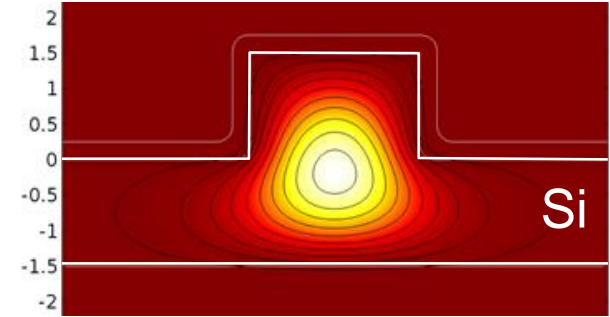
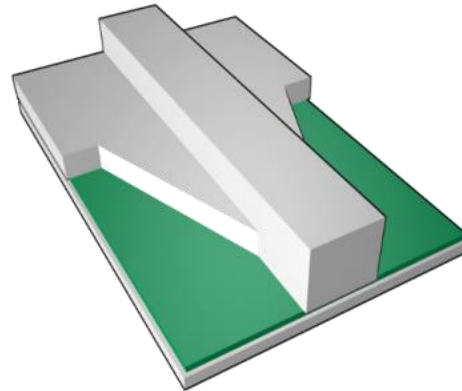
Multi-mode strip waveguide with pedestal



# 3 $\mu\text{m}$ -thick rib and strip waveguides

1. Keeping light in the fundamental mode
  - Effectively **single-moded** waveguide circuits
2. Large core allows to propagate high power ( $\approx 1$  W)
3. Ultra-high confinement:
  - Ultra-wide wavelength range (1.2 - 6  $\mu\text{m}$ )
  - Small 0.1 - 0.15 dB/cm loss for both waveguides
  - Zero birefringence in (square) strip waveguides

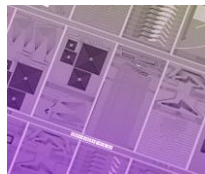
Thicker SOI has reduced sensitivity to linewidth and SOI thickness variations





## Consultation & feasibility studies

VTT can help you to understand SiPh and to see what silicon photonics can do for you and **your business**.



## Multi-project wafer runs

Low-cost **prototyping** using VTT's process design kit (PDK) and mature process modules. VTT delivers SiPh chips with your layout.



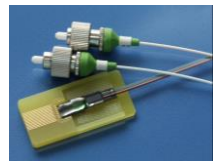
## Design support

VTT can provide all or part of the **design** and **simulation** work that is needed to convert your conceptual idea into a product.



## Dedicated process runs

VTT can provide full SiPh wafers, **customized wafer processes** and process development to come up with an optimized solution for you.



## Assembly, packaging and testing

VTT can help you to convert optical chips into functional **modules** and **systems**, and to **test** those on wafer/chip/module/system level.



## Contract manufacturing

After successful prototyping at VTT, small and medium volume **production** is available via VTT Memsfab Ltd. in the same fab.

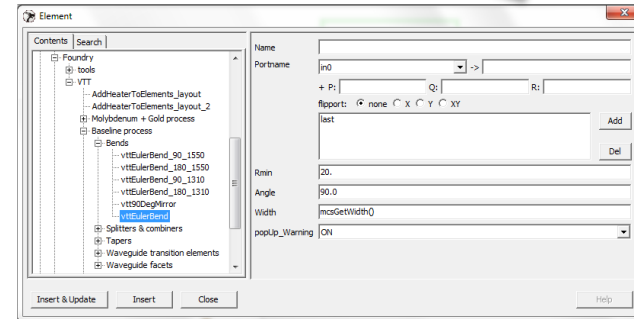
# How to access 3 $\mu\text{m}$ SOI technology

- **Multi-project wafer (MPW) runs** twice a year (PDK available)
- Contract R&D projects for dedicated runs and other services
- Contract manufacturing via VTT Memsfab Ltd. (same fab)
- Jointly funded research projects (EU etc.)
- Licensing of IPR and know-how



## Micronova clean room facility:

- National research infrastructure in Espoo, Finland
- 150 mm wafer size (upgrade to 200 mm in 2023)
- 2 600 m<sup>2</sup> clean room





## Run 20-1

Design deadline May 15<sup>th</sup> 2020

Process modules	Est. delivery	Base price	Maturity
Passive	September 2020	9 500 €	High
Active	November 2020	14 500 €	High

## Run 20-2

Design deadline October 2<sup>nd</sup> 2020



Process modules	Est. delivery	Base price	Maturity
Passive	January 2021	9 500 €	High
Active	March 2021	14 500 €	High
Active with Ge PDs	May 2021	32 000 €	Medium

# bey<sup>0</sup>nd

## the obvious

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