An EU project led by AUTH

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What is micro-transfer printing?

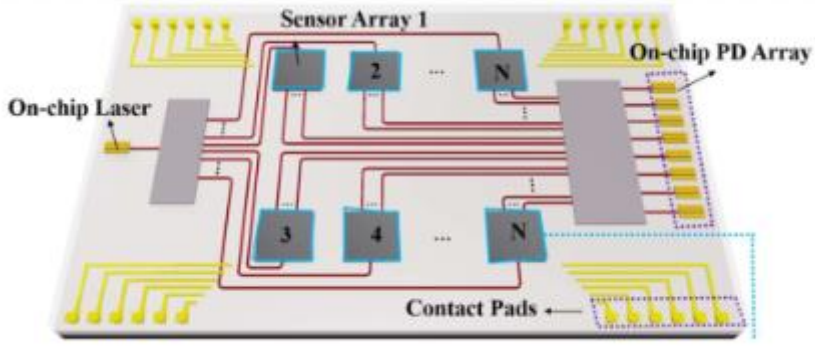
Micro-transfer printing is a technique where we can combine foreign materials and foreign substrates. In the source wafer (for Ambrosia these are Indium Phosphide actives), the relevant device epitaxies are grown and processed with functional layers to enable release of the device.

During the later stages of the device, tethers are patterned and the functional layers are etched, resulting in a suspended (released) device that can be picked up by a polymer stamp and transferred to a different substrate.

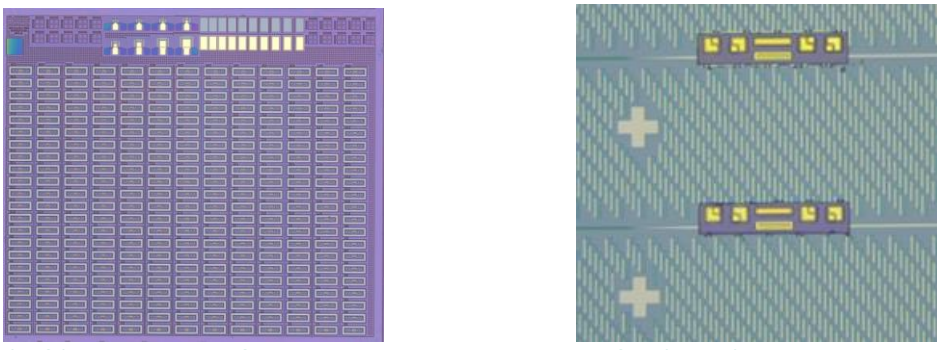
MTP allows flexibility of integration, whilst also allowing for good through-put, particularly when array-printing is employed.

Emphasis on active integration on silicon photonics

Within the Ambrosia project, we are trying to develop a photonic integrated circuit (PIC) for detecting sepsis at point-of-care. A point-of-care diagnosis chip needs to be deployable, meaning the integration of various active components (laser, and detector) are required. SMART Photonics and X-Celeprint are aiming to achieve this using micro-transfer printing.



Example schematic of the AMBROSIA PIC. The on-chip laser and on-chip photodetector (PD) array will be integrated via micro-transfer printing. Enabling a more elegantly packaged solution compared to approaches using optical fibre.



(Left): Photodiodes fabricated on the InP source wafer. (Right): The same photodiodes after MTP onto the target silicon wafer.

X-Celeprint used an MTP-200 tool to print and align the PDs from SMART onto the LGT SiPho platform. This first demonstration of integrated III-V components was showcased by SMART at ECOC 2025.

To obtain confidence in devices for integration, measuring them before printing is highly desirable. SMART is currently performing source-wafer electrical measurements to assess the performance of the devices as fabricated.

The Ambrosia consortium

Link to the project website

LinkedIn

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What's going on and what is coming up in the consortium?

Previous events

ECOC demonstrator September 29-October 2nd, Copenhagen, Denmark

30M GA meeting in Cork, Ireland October 21st to 22nd 2025.

November 2025 – tape out for second target PIC run to demonstrate III-V active integration

Upcoming

AMBROSIA project review Q1 2026

The AMBROSIA consortium at their GA meeting in Cork, Ireland on the 21st-22nd of October.