PATTERN

Next-generation ultra-high-speed microwave **P**hotonic integr**AT**ed circui**T**s using advanc**E**d hyb**R**id i**N**tegration

The PATTERN project will develop the world's first Process and Assembly Design Kits (PDK & ADK) for microwave photonics at ultra-high frequencies (100+ GHz) as well as new methods of heterogeneous integration of III-V gain materials (e.g. InP) and BiCMOS drivers with electro-optic and nonlinear platforms such as lithium niobate on insulator (LNOI). The project envisions to:

DESIGN

novel advanced PIC building blocks such as **acousto-optic modulators** (AOMs) by combining surface acoustic waveguides (SAWs) and waveguides as well as **magneto-optic isolators** through hybrid integration of yttrium iron garnet (YIG) and LNOI

DEVELOP

a wafer-scale solution for **heterogeneous integration** of indium phosphite (InP) **gain chips and photodetectors on top of an LNOI** platform by means such as **flip-chip bonding and micro-transfer print**

COVER

all processing steps and expertise for **microwave photonics at ultra-high speeds** (above 100 GHz), from PDK components such as **LNOI modulators** and **InP detectors** to assembly and **packaging** as well as **BiCMOS drivers** and **design software** for microwave photonics

ENABLE

unrivalled new PIC functionalities, components and subsystems such as **fast tuneable lasers** for a vast range of applications, from quantum computing and quantum communication to ultra-high-speed telecom, optical computing, sensing and metrology

DEMONSTRATE

the capabilities of the new ultra-high-speed components and heterogeneous integration through **six major prototypes** for different end-user applications in the fields of **quantum computing** and **sensing** to **space communication systems** and **low-noise microwave generation (OEOs and OPLLs)**

THE PROJECT

PROJECT ACRONYM & TITLE

PATTERN

Next-generation ultra-high-speed microwave **P**hotonic integr**AT**ed circui**T**s using advanc**E**d hyb**R**id i**N**tegration

STARTING DATE
01/09/2022

DURATION
48 months

EU FUNDING
4,9 M€

TOTAL BUDGET
7,2 M€

COORDINATOR
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11 partners

7 countries

CALL / TOPIC
HORIZON-CL4-2021-DIGITAL-EMERGING-01-07

GA NUMBER
101070506

CONSORTIUM

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Funded by the European Union

Funded by the European Union. Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union. Neither the European Union nor the granting authority can be held responsible for them.

Project funded by

Schweizerische Eidgenossenschaft
Confédération suisse
Confederazione Svizzera
Confederaziun svizra

Swiss Confederation

Federal Department of Economic Affairs, Education and Research EAER
State Secretariat for Education, Research and Innovation SERI

This work has received funding from the Swiss State Secretariat for Education, Research and Innovation (SERI).

UK Research and Innovation