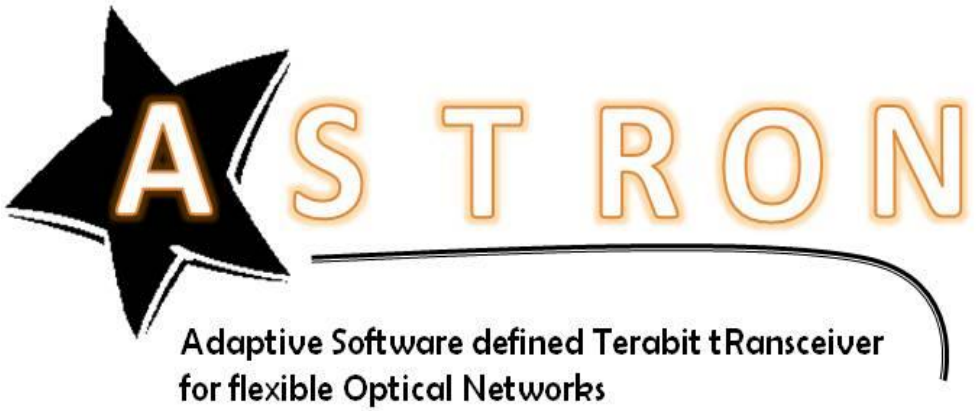

Project Overview

The Consortium

OPTRONICS TECHNOLOGIES S.A.

-Mr. George Papastergiou *(Coordinator)*
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-Dr. Marianna Angelou

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-Dr. Shalva Ben-Ezra *(WP2 Leader)*

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- Dr. Mayra Irion

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-Dr. Ronald Kaiser *(WP3 Leader)*
-Dr. Karl-Otto Velthaus

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-Dr. Gunther Vollrath *(WP6 Leader)*

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-Dr. Ioannis Tomkos *(Technical Manager)*
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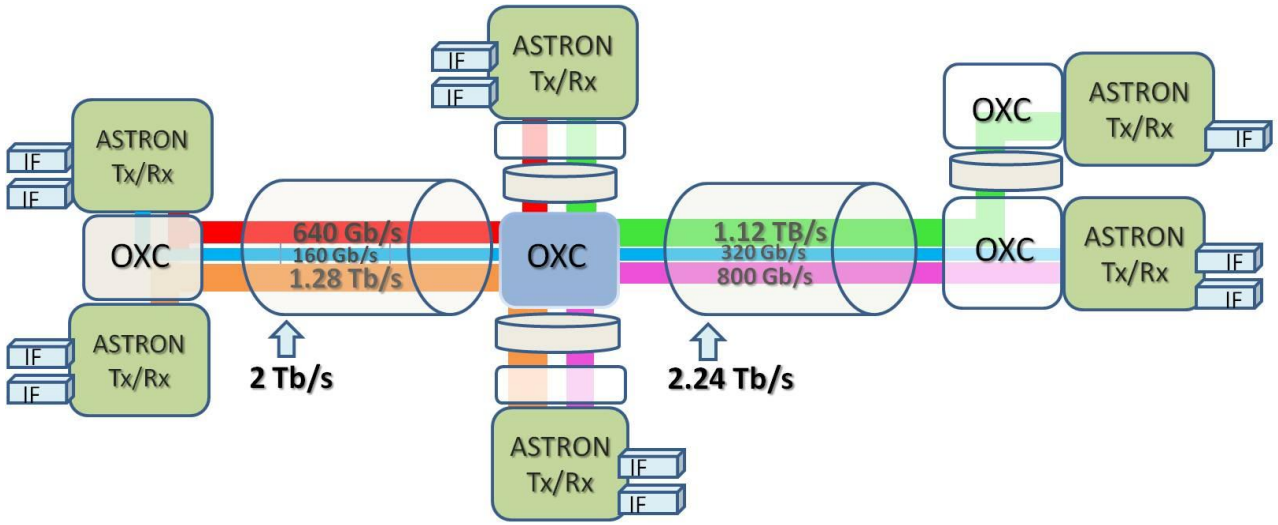
-Dr. Naoya Wada
-Dr. Satoshi Shinada
-Dr. Satoshi Shimizu
-Dr. Ben Puttnam

OptoScribe

-Nicolas Psaila

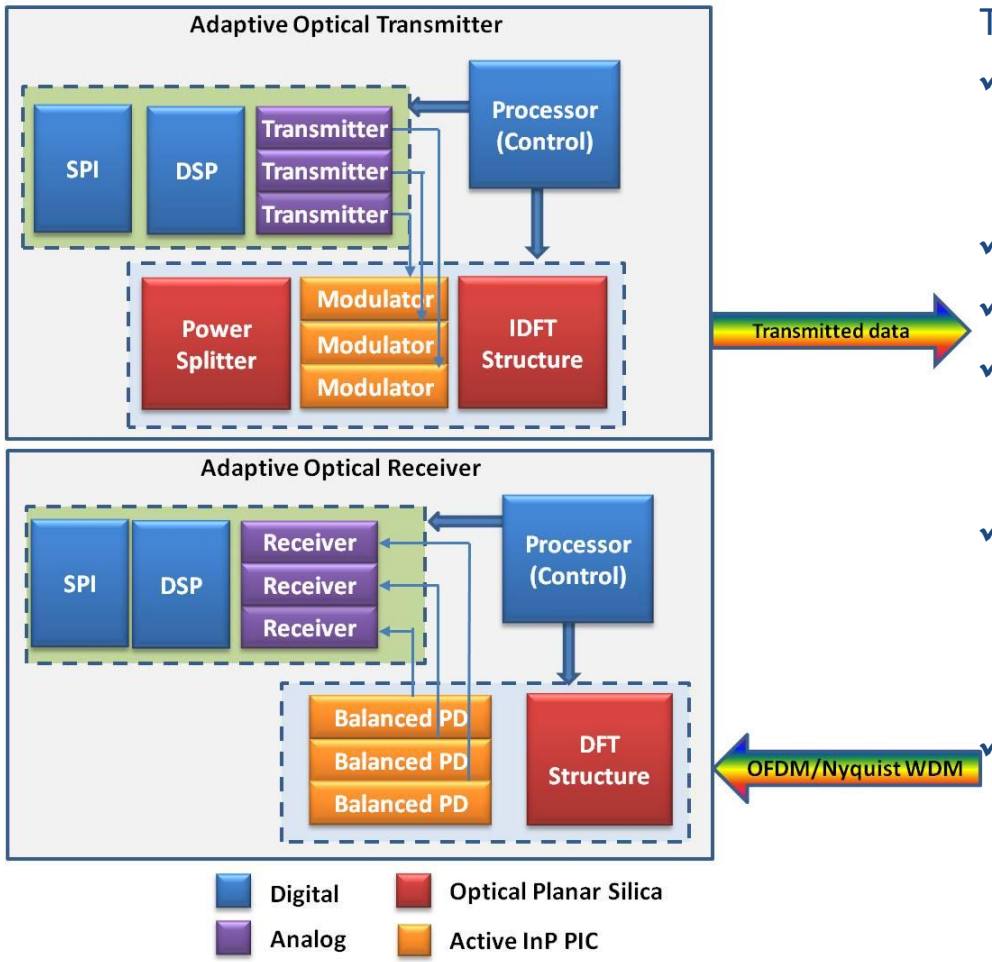
Motivation

- ASTRON envisions an adaptive optical network architecture in which the adaptive-rate transceivers (Tx/Rx) allocate end-to-end optical paths with right-sized bandwidth adjusted to traffic demand.
- The optical paths are transmitted through bandwidth-variable optical cross-connects (BV OXC) which enable allocation of optical spectrum exactly matching the capacity of optical paths.



"ASTRON aims at the development of high-capacity, energy-efficient and bit-rate flexible optical transceivers capable of supporting rates from 10Gb/s to beyond 1Tb/s. The ASTRON concept is based on developing multi-functional and agile devices so as to achieve Terabit capacities on a single photonic integrated chip."

The ASTRON Transceiver Architecture



The main features of the Tx/Rx :

- ✓ Reconfigurable bandwidth allocation using either Optical OFDM or Nyquist WDM technology
- ✓ Programmable modulation formats
- ✓ Programmable data rate
- ✓ Programmable FEC (offering tunability of the ratio of the actual payload to the FEC)
- ✓ Energy-efficiency by incorporating state-of-art digital, analog, mixed-signal and optical components into an integrated platform
- ✓ Design for manufacturability using components that can be easily produced at low cost embedded into a compatible package

Project Objectives

System architecture and requirements (WP2)

- Objective 1: Development of modeling and simulation tools to define system and parameters specifications with respect to green aspects and cost
- Objective 2: Design and fabrication of all optical IDFT/DFT AWG-based structures
- Objective 4: Development of advanced hybrid integration platform
- Objective 5: Design and development of integrated multi-channel transmitter module
- Objective 6: Design and development of integrated optical coherent receiver module

Optical transmitter (WP3)

- Objective 2: Design and fabrication of all optical IDFT/DFT AWG-based structures
- Objective 3: Development and fabrication of InP-based twin IQ Mach-Zehnder modulator chips
- Objective 5: Design and development of integrated multi-channel transmitter module

Optical Coherent receiver (WP4)

- Objective 2: Design and fabrication of all optical IDFT/DFT AWG-based structures
- Objective 6: Design and development of integrated optical coherent receiver module

Software Defined Signal Processing Modulation and Control(WP5)

- Objective 7: Development of novel software defined Signal Processing modules
- Objective 8: Development of state-of-the-art DSP techniques

Integration and Performance Evaluation (WP6)

- Objective 4: Development of advanced hybrid integration platform
- Objective 5: Design and development of integrated multi-channel transmitter module
- Objective 6: Design and development of integrated optical coherent receiver module

Dissemination, Exploitation and Standardization (WP7)

- Objective 9: ASTRON technology exploitation

Exploitation Potential and Impact

✓ Competitiveness

- ASTRON comes to meet the requirements of the next generation networks by introducing a new design and development process for an integrated optical transceiver that will enable the wide and cost-efficient deployment of flexible core and access networks.
  - → Increasing the transparency, the information throughput, and the power consumption reduction in adaptive Tb/s networks; to this end the software-defined optical transceiver that can be configured for Nyquist WDM or optical OFDM signals allows programmable modulation formats and data rates. **ASTRON meets the goal for scalable and cost-effective technologies beyond 100 Gb/s single-channel rate.**
  - → Providing flexible, huge bandwidth on-demand to each user, reducing latency and network complexity. An optical OFDM system is protocol and modulation format transparent, WDM compatible, and we envision future-proof access networks based on this new technology. **ASTRON meets the goal for affordable technologies enabling more than 10 Gb/s data-rate per client for long-reach access networks.**
- In order to design and fabricate dynamic, agile photonic components with increased intelligence, ASTRON will advance the most prominent state-of-the-art component technologies and effectively combine them to exploit their inherent advantages.
- ASTRON will focus its efforts on tackling the challenge of how to achieve cost, size and performance levels well beyond today's standards.

✓ Industrial leadership

- ASTRON aspires to provide European industry with a strong technological advancement that will offer to operators invaluable opportunities;
  - → ASTRON will effectively decrease the total cost of ownership (TCO) enabled by the low cost of the Tx/Rx modules.
  - → Besides the benefits related to CAPEX, operators will be able to enjoy significant OPEX savings associated with the energy efficient integrated platform.

Contact Details

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