



Programmable Photonics

# Packaging challenges on Programmable Integrated Photonics

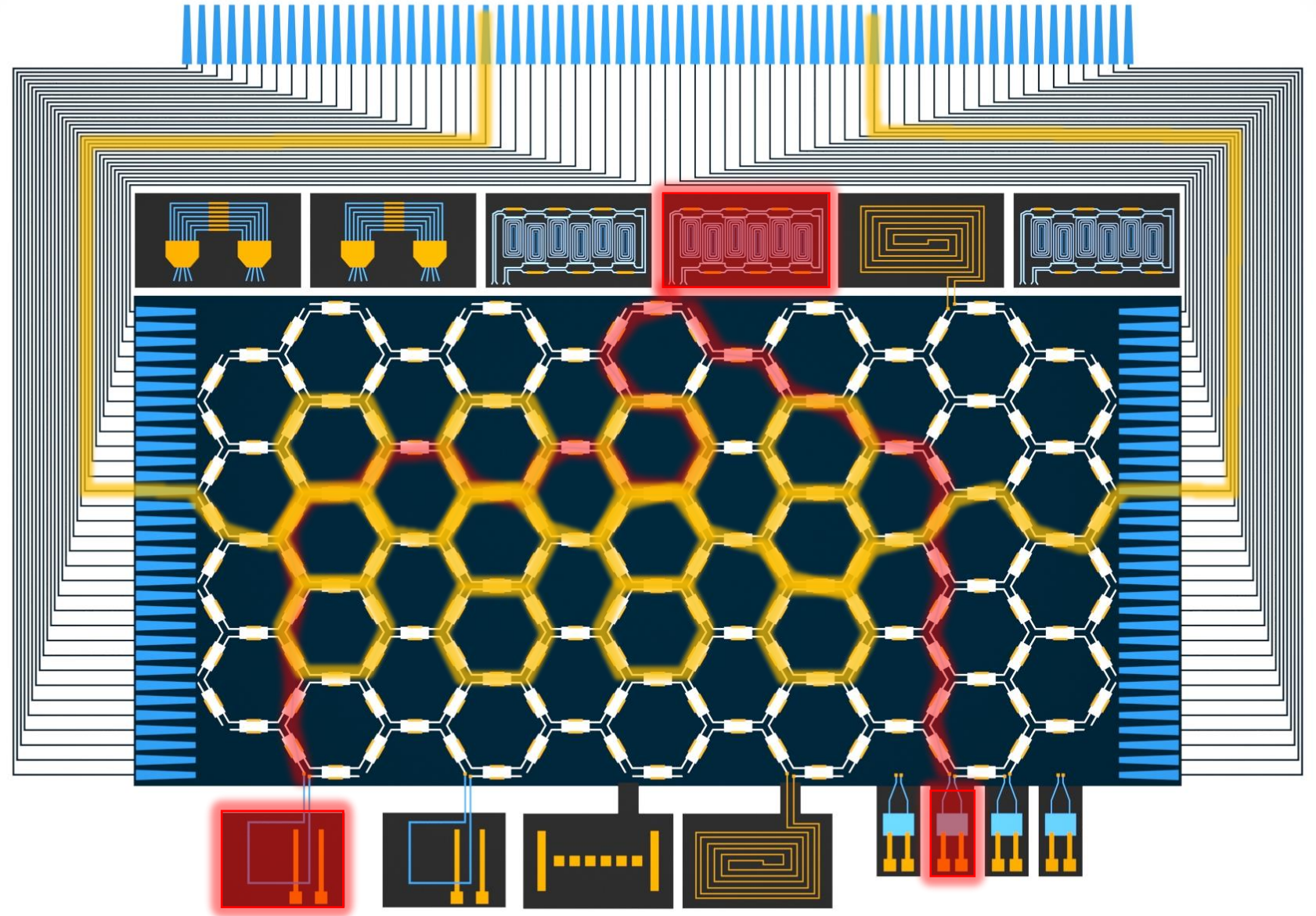
Ana González  
Director of Strategic Partnerships



- IoT
- Train
- Heart
- Airplane
- Car
- Beaker
- Brain

# iPronics FPPGA

iPronics has developed the hardware of a multipurpose photonic processor including a flexible optical core and IP/High performance blocks



# iPronics SMARTLIGHT

iPronics has developed the necessary software to program, control and optimize our solutions in a user-friendly yet, powerful way.

The screenshot displays the iPronics SMARTLIGHT software interface. The main workspace shows a hexagonal lattice structure, likely representing a photonic crystal or similar optical component. The interface includes a menu bar (File, Edit, View, Navigate, Code, Refactor, Run, Tools, Window, Help, SMARTLIGHT, Library, Community) and the iPronics logo in the top right corner.

**Editor:**

```
import ipronics as iPIC
import ipronics_smartlight as sml

fppa.beamsplitter(input_port = 6, output_port =
[7,8,9,10,11,12,13,14])

fppa.smart_switch(input_port = [1, 2, 3, 4], output_port =
[7,8,9,10])

fppa.optical_filter(input_port = 6, output_port = [5], fsr =
20e9, central_wavelength = 1.55e6)

|
```

**Variables and analysis:**

graph	mycore
pucs	mypucs
estimated_loss	lossmatx
HPBs	HPBlist
Optical_filter	filter1
Optical_filter	filter2

**Console:**

```
loading fppga ... COMPLETED
Self characterization ... COMPLETED
Self_configuration... COMPLETED
Optimization ... in progress
```

**Resources monitoring:**

PUCs	30%
Power Consumption	385 mW
Crosstalk correction	activated
HPBs	2/12
Lock	True
Monitor and record	True

**Performance estimator, Auto-characterization, Developer Mode:**

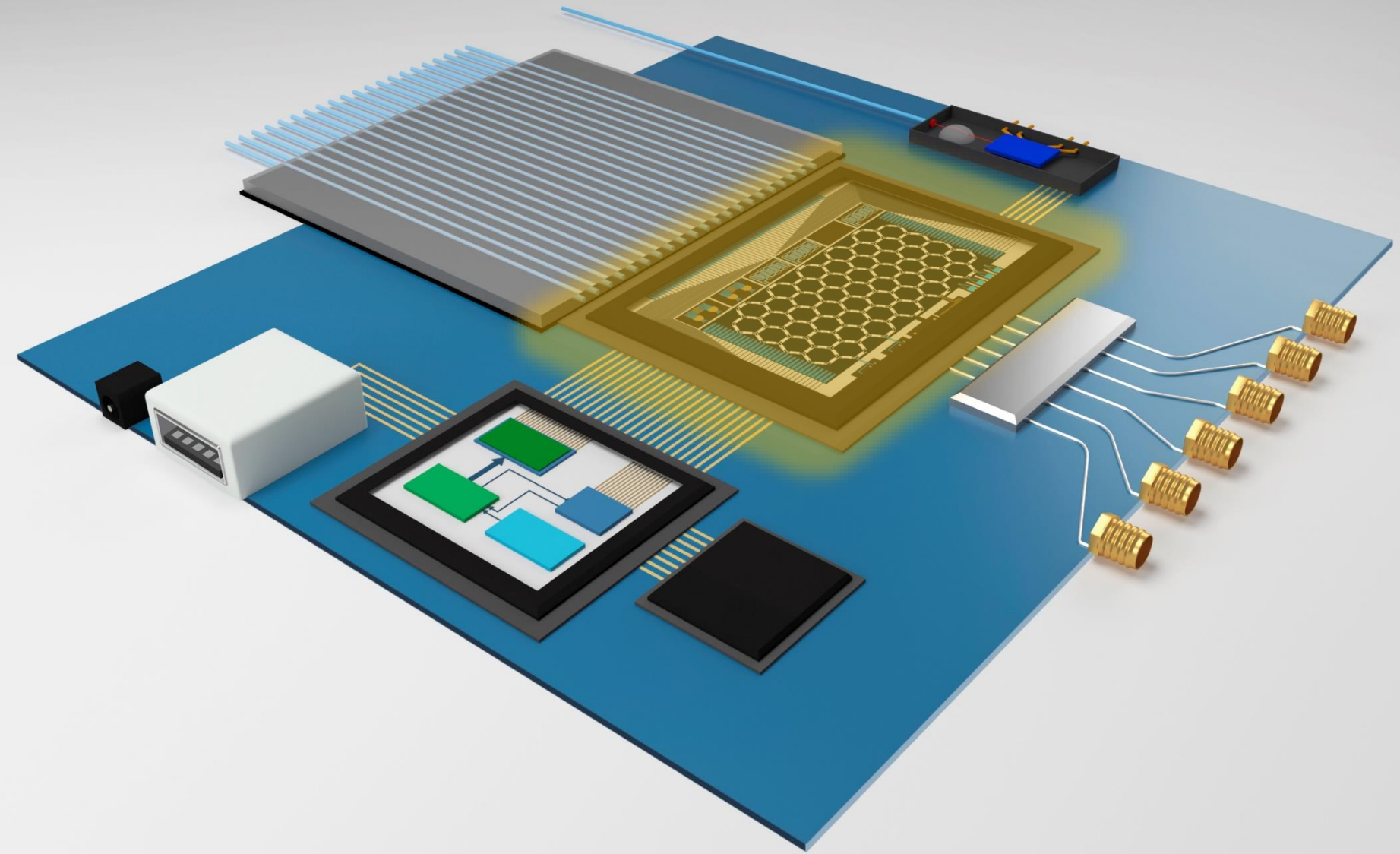
- Performance estimator
- Auto-characterization
- Developer Mode

**Self-configuration, Auto-routing, Backend APIs:**

- Self-configuration
- Auto-routing
- Backend APIs

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Pic design:

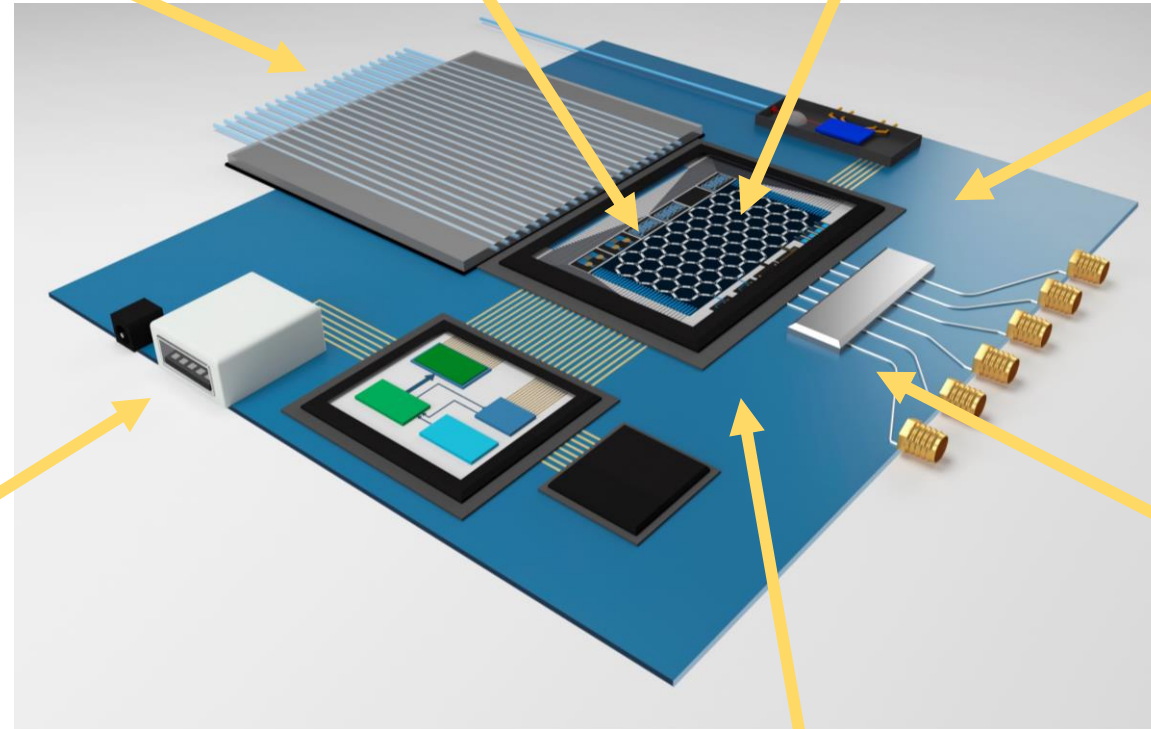
- Chip level
- System level

Silicon foundries  
(testing?)

Fiber Arrays  
(32/64/128)

PCB

- Electrical substrate manufacturing
- Multi Electronic Driver Array
  - 2000 channels
  - 10mW per channel
- Multi Electronic Monitor Array
  - Readout PD > 500 monitors
  - Time response: 10 ms



TEC

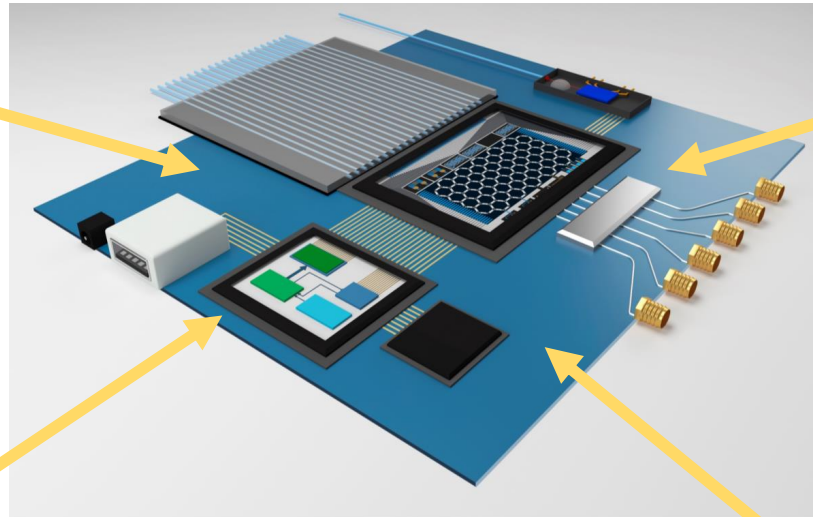
Packaging services

- Flip chip bonding
- Wire bonding
- Fiber Align
- Testing

# Apply to our $\beta$ -tester program

Data Center  
Applications

RF Applications



General Purpose

Computing



Programmable Photonics

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