

# Réseaux semi-conducteurs et photodétection

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# Instrumentation networks

## Objectives

Created in 2012 to:

- Favour the exchanges among experts in instrumentations
- Foster collaborations among labs, for prospective R&D projects
- Identify emerging technologies and local expertise
- Share good practice and common tools for a rationalized used of available resources

## Application domains

- ★ Particle Physics, Nuclear Physics, Astroparticle Physics
- ★ Space Astrophysics
- ★ Medical Physics
- ★ Synchrotron Radiation studies
- ★ Detection in extreme conditions (nuclear plants)
- ★ Industry

# Semi-conductor network: structure

16 laboratories, ~ 50 members

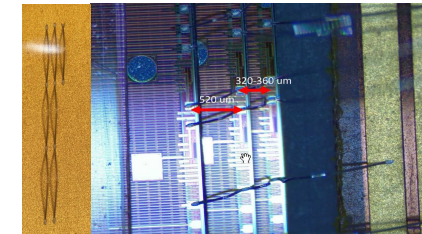


Contact: [ana.torrento@ijclab.in2p3.fr](mailto:ana.torrento@ijclab.in2p3.fr)

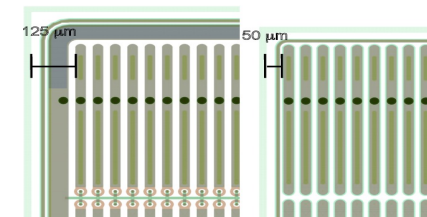
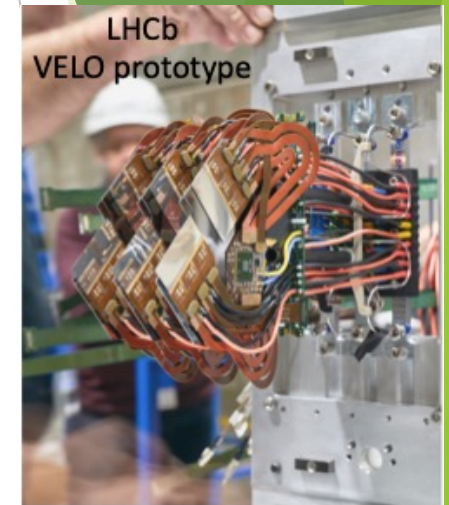
# Semi-conductor network: expertise

## → Semiconductor detector technologies

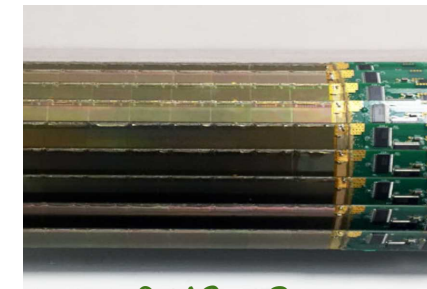
- ◎ Silicon: Surface barrier, SiLi, position - sensitive (resistive surface, strips, pixels), avalanche (LGAD, SPAD, SiPM), PiN, MAPS, SSD, DEPFET, BMJ
- ◎ Germanium: monobloc, segmented
- ◎ Diamond: pad, segmented
- ◎ SiC
- ◎ CdTe, HgCdTe, InGaAs, GaN, InP



Stitchy bonding



Active edge (ATLAS)



STAR - PXL



ALFA (CL)

# Photodetector network: structure

11 laboratories  
~20 members



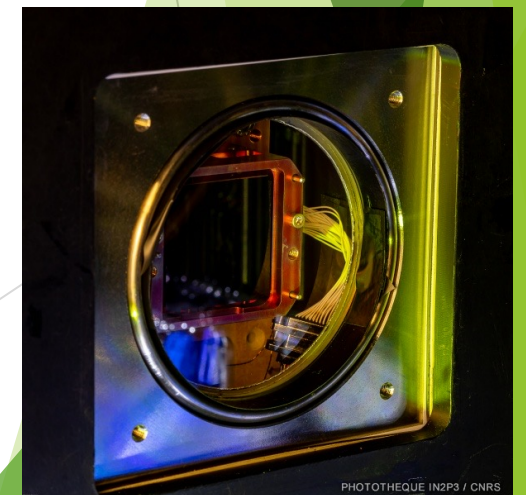
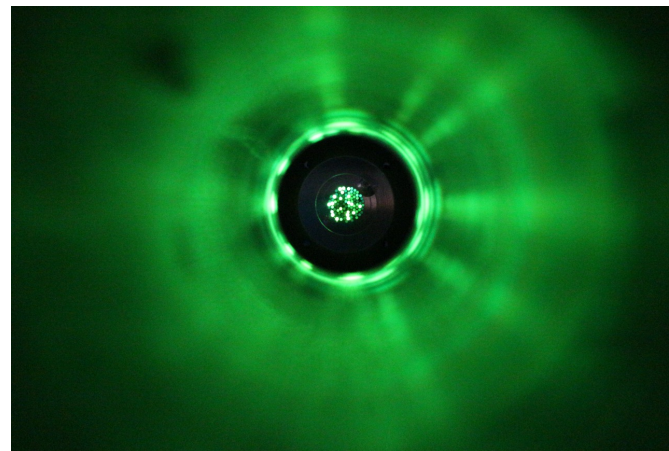
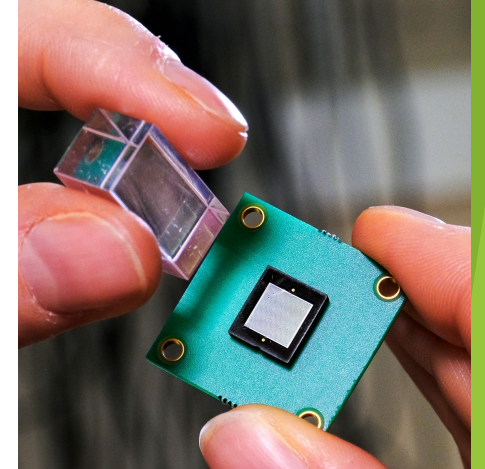
- We need correspondents from LPC, LAPP, LLR
- The network is open to non-IN2P3 labs
- If you are interested, join the mailing list [RESEAU-RDPHOTODETECTION-L](https://listserv.in2p3.fr/RESEAU-RDPHOTODETECTION-L) at <https://listserv.in2p3.fr/>

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# Photodetector network: expertise

## → Detector types and transverse expertise

- ⊙ Photodetectors: SiPM, PMT, MCP-PMT, CCD
- ⊙ Organic and Inorganic scintillators (growth, optical coupling, characterisation...)
- ⊙ Cherenkov detectors
- ⊙ Electronic front-end/read-out
- ⊙ Simulations



# Previous workshops of Semi-conductor Network

2013	<b>Simulation</b> IPN (Orsay)	<a href="https://indico.in2p3.fr/event/8900/">https://indico.in2p3.fr/event/8900/</a>
2014	<b>Intégration de détecteurs.</b> LAL (Orsay)	<a href="https://indico.in2p3.fr/event/11470/">https://indico.in2p3.fr/event/11470/</a>
2015	<b>Électronique front-end associée aux détecteurs semi-conducteurs</b> LPNHE (Paris)	<a href="https://indico.in2p3.fr/event/11595/">https://indico.in2p3.fr/event/11595/</a>
2016	<b>Effet des irradiations dans les détecteurs semi-conducteurs</b> LPNHE (Paris)	<a href="https://indico.in2p3.fr/event/13060/">https://indico.in2p3.fr/event/13060/</a>
2017	<b>Fabrication de détecteurs semi-conducteurs.</b> LPNHE (Paris)	<a href="https://indico.in2p3.fr/event/14663/">https://indico.in2p3.fr/event/14663/</a>
2018	<b>Les détecteurs à pixel</b> LPSC (Grenoble)	<a href="https://lpsc-indico.in2p3.fr/event/1769/">https://lpsc-indico.in2p3.fr/event/1769/</a>
2019	<b>Les détecteurs rapides et leur électronique associée</b> CPPM (Marseille)	<a href="https://indico.in2p3.fr/event/18911/">https://indico.in2p3.fr/event/18911/</a>
2021	<b>Méthodes de test orientées simulation</b> IP2I (Lyon - visioconférence)	<a href="https://indico.in2p3.fr/event/20627/">https://indico.in2p3.fr/event/20627/</a>
2022	<b>Applications médicales des détecteurs semi-conducteurs: imagerie et dosimétrie</b> IPHC (Strasbourg)	<a href="https://indico.in2p3.fr/event/26864/">https://indico.in2p3.fr/event/26864/</a>
2023	<b>Les détecteurs semi-conducteurs dans l'espace</b> Subatech (Nantes)	<a href="https://indico.in2p3.fr/event/29399/">https://indico.in2p3.fr/event/29399/</a>

# Practical information

## 4 sessions:

- Gamma detectors
- From visible to mm wavelength detectors
- X-ray detectors
- Detectors for synchrotron radiation

Poster sessions during coffee-breaks and the cocktail

## 2 industrial participants:

- CAEN
- SiClade Technologies

## WI-FI connection:

- eduroam (first choice)
- LPSC-guest (only if you do not have an account eduroam.  
maxime.pinson@lpsc.in2p3.fr will validate your access)

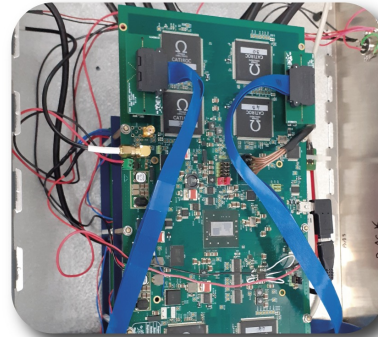
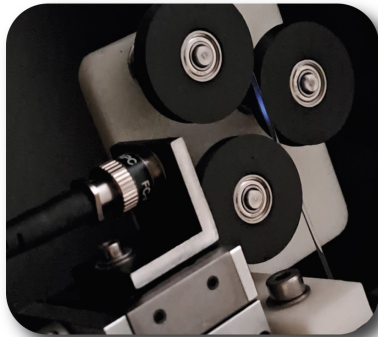
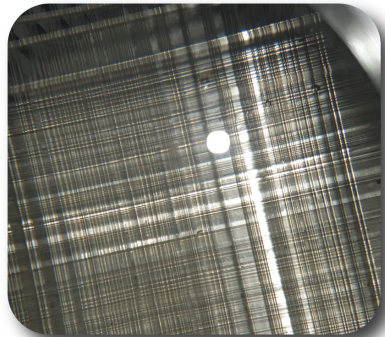
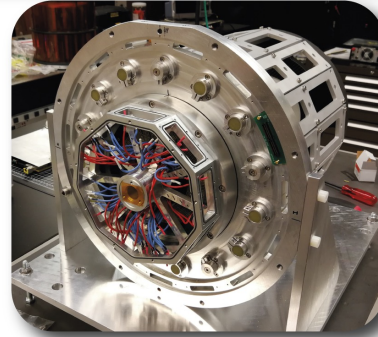
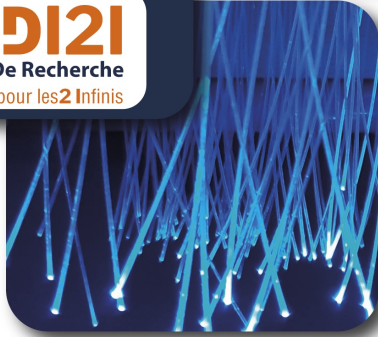
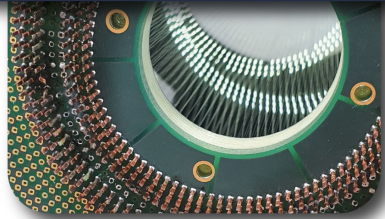


# Practical information

Please leave your badge on the table

ESRF visit (limited access)

- we are supposed to leave a bit before 14 pm
- let's meet at the entrance, a lunch box will be available for a quick meal
- bring you ID card



▪ DÉTECTEURS GAZEUX

▪ DÉTECTEURS À SEMI-CONDUCTEURS

▪ DÉTECTEURS CRYOGÉNIQUES

▪ CALORIMÉTRIE ET PHOTO-DÉTECTEURS

▪ CAPTEURS QUANTIQUES

▪ CIRCUITS INTÉGRÉS ET DAQ



Date limite d'inscription  
7 Juin 2024



Exceptional session in this year's edition:

- Setup a collaboration between AAP and DRD
- Round table on cryogenic needs at IN2P3
- Poster session

Thank you!

