

# ECFA WS & CSN5 Call on Pixels

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*Indico agenda:*

<https://agenda.infn.it/conferenceDisplay.py?confId=6583>

# ECFA WS: Tracking Session

- Contacted Ingrid Gregor (one of the three ATLAS conveners of the PG, others are D. Ferrere and C. Buttar).
- Non much progress since the last preparatory meeting:
  - <http://indico.cern.ch/conferenceDisplay.py?confId=255666>
- Speakers not decided yet.
  - Waiting to receive all speakers before taking action (expected in a few days)
- Conveners are preparing abstract
  - Ingrid asked input asap for the preparation of the talks.
    - Also documents are in preparation
  - Cross-experiments presentations.
- Considerations: not much progress on the conveners' side.
  - I had not much time either... INFN Calls have priority!

- *Decided to split Pixel Call into two:*
  - 65 nm electronics for FE: coordinated by Lino Demaria
  - Pixel core technologies: coordinated by Nanni Darbo
  
- *Splitting has effect of being below threshold for the Pixel core technologies.*
  - Added two other very interesting technologies, first contact with key technology experts look promising:
    - Pixel 4D: very thin (few tens of  $\mu\text{m}$ ) planar detectors with gain multiplications
      - Possible application for fast timing detectors (AFP)
    - Microcooling: use of CO<sub>2</sub> cooling with micro-channels ( $\Phi \sim 100\mu\text{m}$ ) in carbon fibers or silicon.
      - Pioneered by SuperB and NA62. Interest expressed by ATLAS USC.
  
- *On international side*
  - LHCC proposal on 65nm approved very positively
  - Microfabrication “rimandata a Settembre”

## • *Mainly CMS involved*

- CMS: BA, BG-PV, PD, PG, PI, TO – 11 FTE
- ATLAS: MI (Valentino Liberali + 2 others) – 1 FTE

## • *Activity following CERN RD*

- + prototype chip at the end

## • *Costs*

300k€ 4 MPW

75k€ per studi radiation hardness

75k€ per elettronica varia per test

300k€ per un prototipo per l'ultimo anno

60k€ missioni

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820k€

# INFN Call: ACTIVE (1)

## Pixel core technologies call:

- Acronym (provisional): **ACTIVE**: **A**tlas and **C**ms **T**owards **I**nnovative pix**E**ls
  - Aslo (we hope) **A**tlas and **C**ms **T**ogether for **I**nnovative pix**E**ls
- Individuated activities:
  - **Pixel 3D**: 2x10<sup>16</sup> neqcm<sup>-2</sup>s<sup>-1</sup>, small (1/3 of FE-I4 pixel size), thin (100-150 μm, epitaxial or wafer bonding), active edge. – FTK as main silicon foundry
  - **Pixel 4D**: ultra thin (few tens of μm), charge multiplication, planar technology, active edge – FTK as main silicon foundry.
  - **Bump-bonding**: develop (and QC) BB for 100'000 bumps/chip, thin FE-I4 (100μm), Indium bumps – use BB as part of the sensor test – main foundry Selex (interest in a framework contract). Bump-bonding development is critical technology after IZM experience with IBL.
  - **Microcooling**: technology developed in IT by SuperB and NA62. It is potentially very interesting for low material budget applications.



## *Interested groups:*

- ATLAS: CS, GE, MI, TN, UD
- CMS: BA, FI, MIB, PI, TO (CT & GE uncertain)



## *Costs (back of envelope):*

200k€ - Sensor batches (2 3D + 2 4D) – 2 Convention INFN/FBK + 2 Full price

150k€ - Bump bonding (R&D + Use for sensors)

150k€(?) - microcooling

200k€ - test-beam, irradiation, lab test

60k€ - travel money

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760k€



## *Organization infrastructure*

- Share Point site: <http://cern.ch/INFN-PixelRD>
- Mailing list: [active-gen@cern.ch](mailto:active-gen@cern.ch)
- Kick-off meeting: this afternoon at 16:30:
- <https://indico.cern.ch/conferenceDisplay.py?confId=260228>