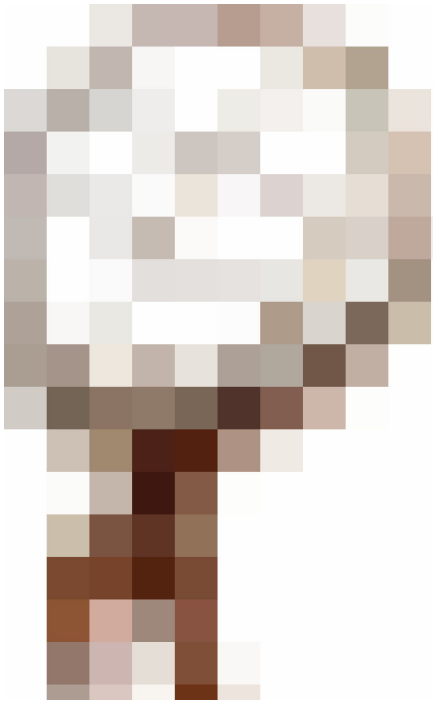
CSN5 Call on Pixels: ACTIVE !

G. Darbo – INFN / Genova



Indico agenda:

https://indico.cern.ch/conferenceDisplay.py?confId=260228

Pixel Gr.5 Calls

- *Decided to split Pixel Call into two:*
  - 65 nm electronics for FE (following RD53 guideline): coordinated by Lino Demaria
  - Pixel core technologies: coordinated by Nanni Darbo

- *(Possibly) Individuated activities:*
  - **Pixel 3D**: $2x10^{16}$ $n_{eq}cm^{-2}s^{-1}$, small (1/3 of FE-I4 pixel size) needs thin (100-150 μm, epitaxial or wit support wafer), active edge, charge multiplication. – FTK as main silicon foundry
  - **Pixel 4D**: ultra thin (few tens of μm), charge multiplication, planar technology, active edge, high-rad hard – FTK as main silicon foundry.
  - **Bump-bonding**: develop (and QC) BB for 100'000 bumps/chip, thin (100μm) FE-I4 (size), 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 IBL experience with IZM.
  - **Microcooling**: technology developed in IT by SuperB and NA62. It is potentially very interesting for low material budget applications (B-layer). Silicon with DRIE processing (FBK) or carbon fiber micro-channels.

- *On international side*
  - LHCC proposal on 65nm (RD53): approved very positively
  - LHCC proposal on Microfabrication: "rimandata a Settembre"

Requirements to Build a Collaboration

- *Top technological expertise in the Field*
  - Have on board a few **persons/groups able to drive the key technology** issues:
    - For been convincing toward approval of the project
    - To not be trapped into technological “cul de sac” as beginners.

- *Can be (partially) used for ATLAS/CMS?*
  - Most of the participants interested to apply the technology in the experiment

- *Consider our targets:*
  - Develop (breakthroughs) technologies could be applied to ATLAS/CMS
  - Collect, keep and increase technological expertise for upgrades
  - Have a collaboration size where many of the development can happen inside: present to outside as a larger (stronger) group.
  - Involve Italian firms in the collaboration.
  - Have a strong liaison between technologies/technology developers and experiment communities (improve the chance to get used).

Project Shaping

- *Kick-off meeting (this meeting)*
  - Open to anybody interested in the Call
  - Verify feasibility – tuning of the WP

- *Project name (Sigla INFN)*
  - Acronym (provisional): **ACTIVE**: **A**tlas and **C**ms **T**owards **I**nno**V**ative pix**E**ls
    - Aslo (hope!): **A**tlas and **C**ms **T**ogether for **I**nno**V**ative pix**E**ls

- *Workpackages (updated):*

WORKPACKAGES/COORDINATORS/INSTITUTES

	Name	Coordinator(s)	Institutes
WP1	3D Sensor - Sensor design and production		
WP2	Bump-bonding - process qualification		
WP3	Micro-cooling		
WP4	Module assembly & Test		
WP5	Irradiation & Test beam		
WP6	Project & Resource Coordination	Project Coordinator	

Costs

- *In the cost we consider*
  - Use the FBK/INFN “convenzione” to access the processing facility at very competitive price for only half of the batches (Convention has a limited number of project per year)
  - In study a “framework contract” with Selex

Cost (Back-of-) Envelopes

	Name	Cost	Note
WP1	3D Sensor - Sensor design and production	€ 180 000	FBK 4 runs (3D + 4D) half in "convenzione" + raw wafers + wafer bonding / removal
WP2	Bump-bonding - process qualification	€ 180 000	Develop of technology 100'000 bumps + access to BB for sensor testing + electronic wafers + thinning + dummy wafer production
WP3	Micro-cooling	€ 150 000	samples, processing, CO2 chiller
WP4	Module assembly & Test		PCB, tooling, irradiation, test beam support, lab tests (non inventariabile)
WP5	Irradiation & Test beam	€ 200 000	
	Travel money	60000	Contact to the firms, internal meetings, test beam & irradiation
		€ 770 000	

How to Proceed

- *Look at outcome of today*

- *Update the WBS*
  - See Share Point and get institutes covering

- *Open INFN Sigla and fill documents*
  - Use SharePoint as depository and communications
  - Use English for all documents.

- *Deadline for submission*
  - July 17th

FINANZIAMENTO E ORGANIZZAZIONE	
NOME PROGETTO	
AREA RICERCA	(rivelatori, elettronica)
Responsabile scientifico	
UNITA'/ENTI partecipanti	**RUOLO**
ANAGRAFICA	mesi/persona
CV responsabile progetto	
CV responsabili WP	
ABSTRACT	(max 1 pagina)
BIPR	Background Intellectual Property Rights
WP1	Responsabile Descrizione puntuale delle attività previste Milestone/Deliverables
…….. WPn	
CRONOPROGRAMMA	Milestone/Deliverables principali
	TABELLA RICHIESTA FINANZIARIA
	Enti esterni (descrizione) se presenti
	FONDI ESTERNI - descrizione
	PROPOSTA SCIENTIFICA
PROPOSTA TECNICO-SCIENTIFICA	A) concetti - obiettivi - originalità - innovazione - relazione con stato arte a livello internazionale B) rilevanza - attualità vs INFN e CSN5 C) unità partecipanti - rispettivi ruoli e compiti D) eventuale coinvolgimento di: - altre CSN INFN, istituzioni/lab estere naz/inter, industrie, cofin E) implementazione: - expertise, infrastrutture, collaborazioni, fattibilità e sostenibilità, risorse umane e strumentali disponibili, cronoprogramma, piano di spese F) risk assessment (piani alternativi per garantire il successo della proposta) G) impatto della ricerca, anche alla luce di Horizon 2020.
	ALTRA DOCUMENTAZIONE
	Dichiarazioni di Endorsement da parte di (eventuali) Enti esterni
	Parere positivo del Direttore della Struttura INFN

SharePoint

- SharePoint: cern.ch/INFN-PixelRD

Restricted site for Call Preparation" need authentication

Authentication by request or subscribing mailing list

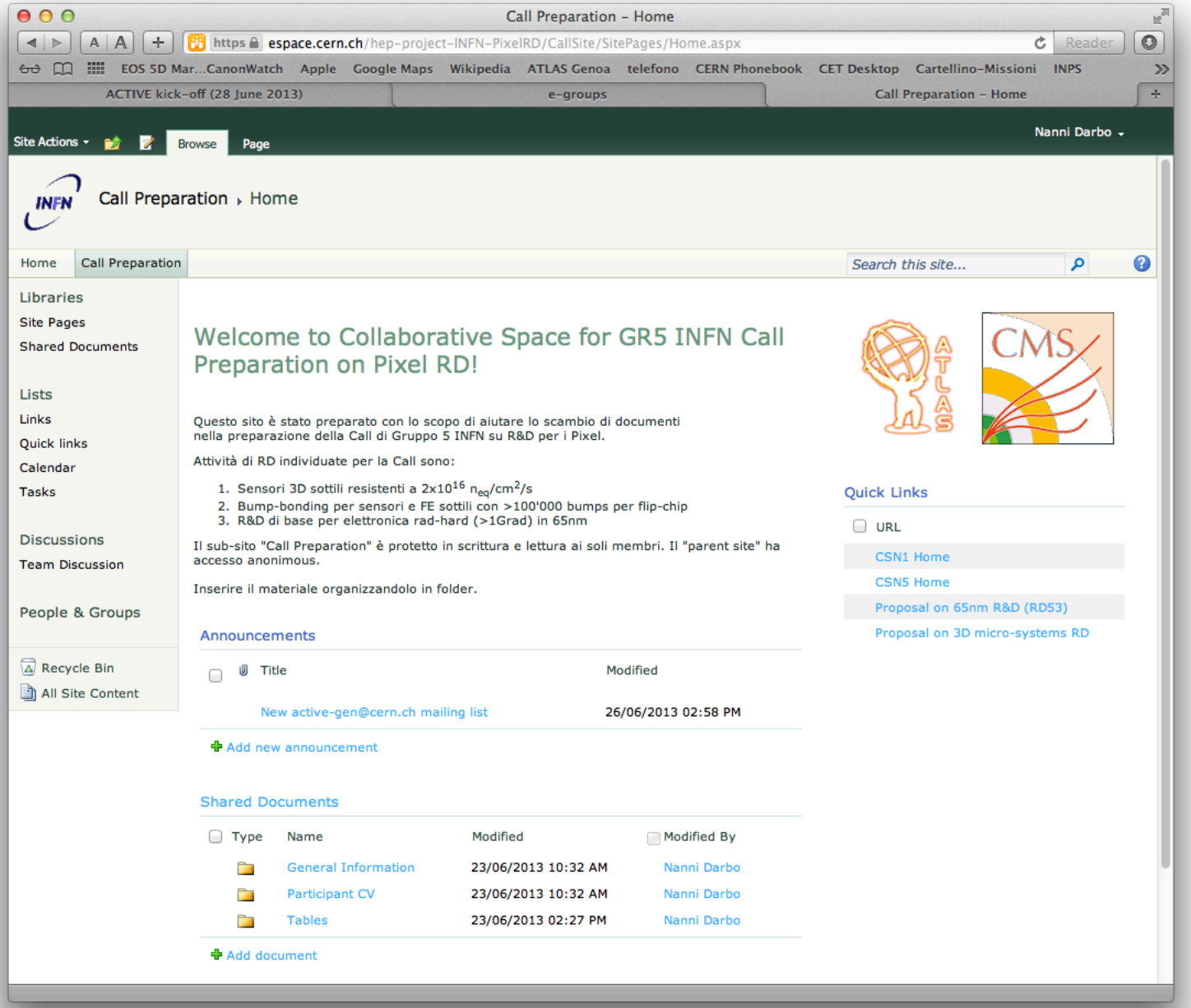
- active-gen@cern.ch

Mailing list subscription need approval by:

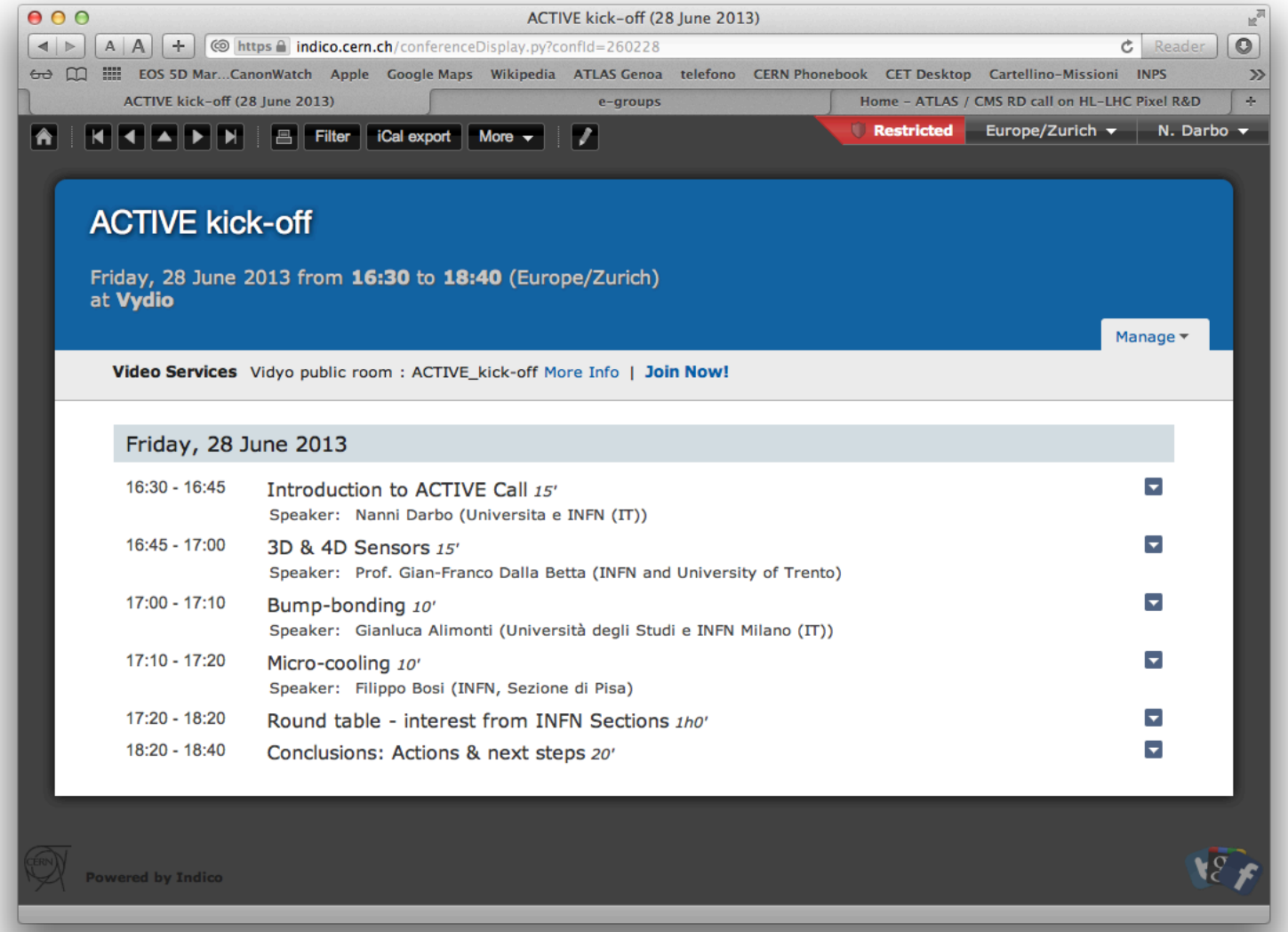
- Marco Meschini
- Nanni Darbo

And can be done via:

- e-groups.cern.ch



Conclusions



- *Conclusions will come at the end of the meeting…*