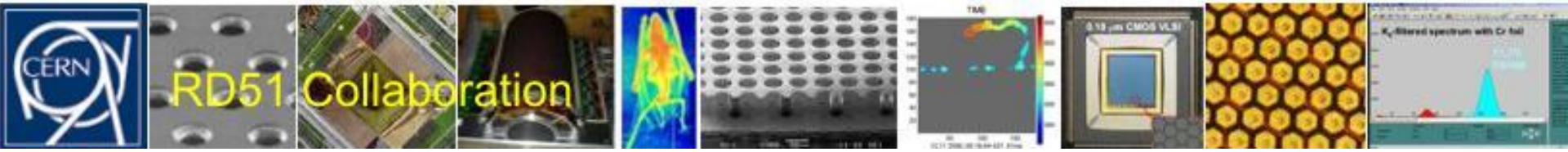


CERN Workshop upgrade

Rui De Oliveira

KOBE

WG6

- **Equipment upgrade**
- **New building**
- **Micromegas in industry**

WG6: TE/MPE/EM Workshop upgrade

- Last year, agreement was reached with CERN management to purchase the subset of machines necessary to carry out R&D on large size GEM (2m x 0.5 m) & Micromegas (2m x 1m) and the associated large size read-out boards in the current CERN TE/MPE/ME facility.

	market survey	call for tender	order	received	ready
GEM					
– 1 continuous polyimide etcher	x	x	x	x	11/2011
– 1 Cu electro-etch line	x	x	x	x	x
– 1 stripping line	x	x	x	x	x
Micromegas					
– 1 large laminator	x	x	x	x	x
– 1 large Cu etcher	x	x	x		01/2012
– 1 large UV exposure unit	x	x	x	x	09/2011
– 1 large resist developer	x	x	x		01/2012
– 1 large resist stripper	x	x	x		01/2012
– 1 large oven	x	x	x	x	x
– 1 large dryer	x	x	x	x	x

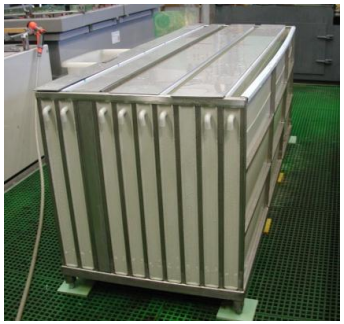
- **On top of introducing new machines we have to:**
  - **-redefine all the process parameter related to the new equipments**
  - **-Build some prototypes of the # detectors**
  - **-Hire a technical engineer for 2 years (AIDA Funds) (in progress)**

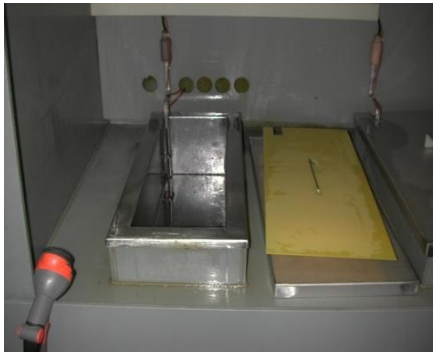
Machine investment for GEM production

- UV exposure unit
  moving from 2m x 0.6m → 2.2m x 1.4m
  30 years old equipment replacement
  TECHNIGRAPH (DE)

Not yet Installed
Already delivered

- GEM alcohol resist stripping
  1m x 0.6m → 2.2m x 0.6m
- GEM electro etch
  1m x 0.6m→ 2.2m x 0.6m
  10 baths compacted
  LECOULTRE (CH)





- GEM polyimide etch
  moving from 1m x 0.6m → ?
  10→ 30 GEM/day
  roll to roll compatible
  no tooling needed
  WISE (IT)

Machine investment for Micromegas production

- Laminator (resist and coverlay)
  0.6m width → 1.4m

WESTERN MAGNUM (US)

- Ovens (cure the coverlay)
  1.5m x 0.6m → 2.2m x 1.4m

JLS (UK)

- Resist developer
- Resist stripper
- Copper etcher
  0.6m width → 1.2m

WISE (IT)

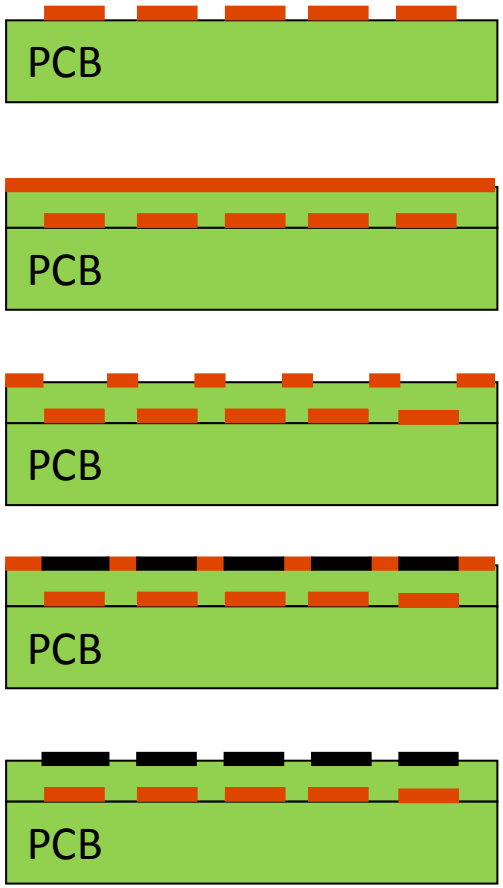
Not yet delivered ordered

- ***UV exposure unit***
- **Room is prepared**
- **Electricity is ready**
- **Air renewal is OK**
- **Move the machine to it's final place to be done soon**

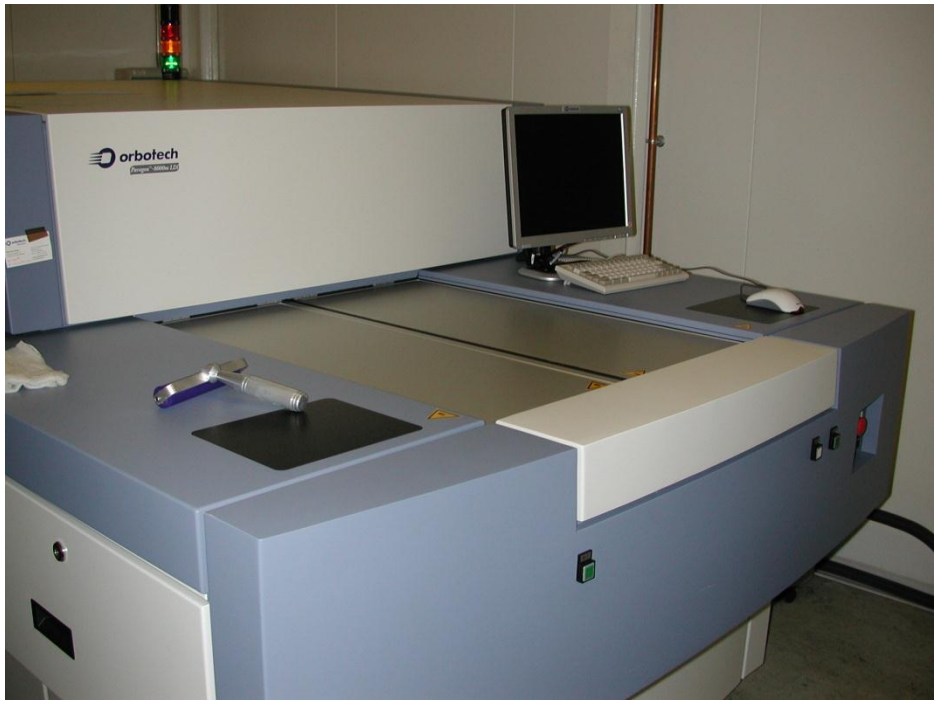
- ***GEM polyimide etching machine***
- **Machine assembly is done**
- **Power connection OK**
- **Air exhaust missing**
- **Chemical connection missing**

Resistive deposition equipment

- This process was not existing when we ask for the subset of machines
- Different techniques are envisaged:
  - Paste filling + polishing (no size limitation)
  - Screen printing (80cm x80cm)
  - Spray deposition (no equipment at CERN)
- In the coming month we are going to study the best solution for mass production.



Machine investment for MPGD production
LDI (laser direct imaging) replacing films or masks

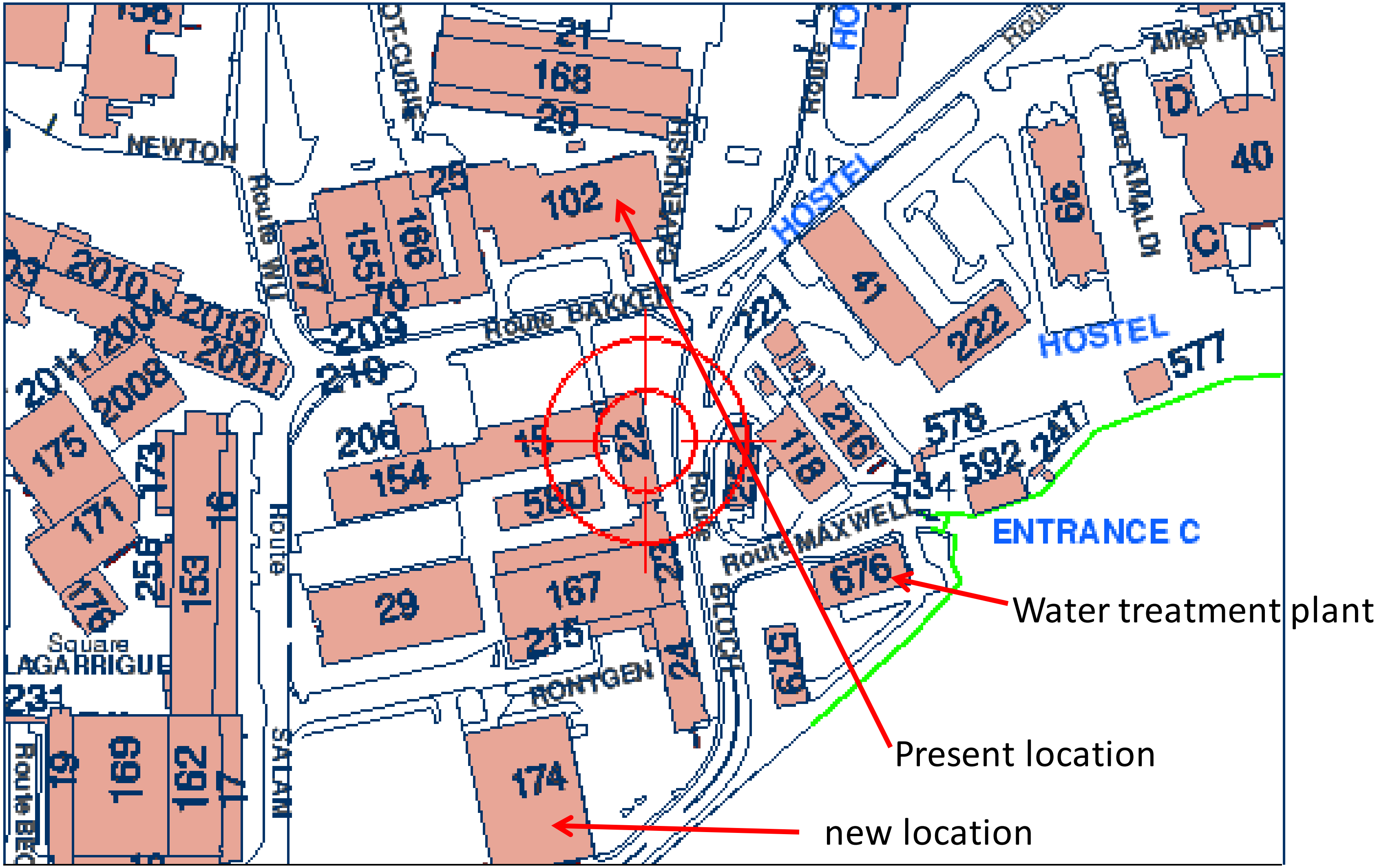


- LDI is fully operational since since 3 months

- Single side GEM
- Special readouts
- Repetitive work
- High alignment accuracy
  - MHSP (large size?)
  - COBRA and THCOBRA

- Equipment upgrade
- **New building**
- Micromegas in industry

New Building 107



Water treatment plant
Present location
new location
ENTRANCE C
HOSTEL

New Building 107

New Building 107

CERN Building 107
Basis of Design

New building 107

- The Consultant company designing the building have been selected
- The design is completed

- The market survey for construction should be launch soon
- The final design will be done with the consultant and constructor
- The construction should start beginning of 2012
- The construction should end October 2013

- 40 square meter room reserved for MPGD assembly
- All the machines for large size detectors production are in the layout
- Area 900 m2 → 1400m2 with optimized layout
- Most of the baths will be replaced by compact machines
- Rooms are reserved for new processes (laser and plasma)

- Equipment upgrade
- New building
- **Micromegas in industry**

Micromegas with company Eltos (IT)

- July the 4th we have got a meeting with the CEO of ELTOS at CERN

- Why Micromegas with Eltos?
  - This company has won a CERN market survey for the production of PCBs out of 80 European companies.
  - They have already made components for MPGD detectors (THGEMs).
  - They are really interested by this project.
  - They have the knowledge to stretch the meshes.
  - They do not reject the idea to build large detectors.

- Decisions taken in collaboration with RD51 leaders during this meeting:
  - 1/ send the files to build a 10 x 10 std Bulk (done)
  - 2/ build the read-out PCB (in progress)
  - 3/ bulk this PCB with CERN help (visit to be scheduled for September 2011)
  - 4/ stop point for radiation test at CERN
  - 5/ technology transfer of resistive strips (November 2011)
  - 6/ production of a protected device (December 2011)

Micromegas/ TRIANGLE LABS

Visited 3/06/2009 in Nevada with Brookhaven lab Atlas Team
-Their equipment is compatible with the production of 2m x 1m Bulk
-They are going to increase their PCB capability up to 1.4 m x 2m (new laminator)
-Print and etch and also Plated through holes
-12 persons
-AOI for read out ?
-Project followed by Vienetos Polychronacos (BNL).

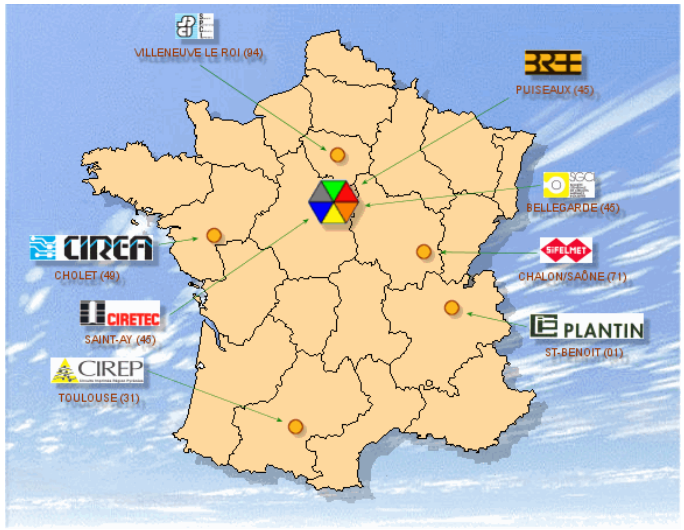
2 m x 1m milling machine

1 meter laminator

CIREA

First contact for large size large volume productions in 2008

CIRE Group
8 companies in France
Possibility to make large boards up to 2mx 0.6m
They have already produced some small BULKS
Project followed by SACLAY



Thank you