CMi EPFL Center of MicroNanoTechnology

ÉCOLE POLYTECHNIQUE FÉDÉRALE DE LAUSANNE

MicroNanoFabrication Annual Review Meeting

Welcome !

- 9th MicroNanoFabrication Annual Review Meeting organized by the EPFL Center of MicroNanoTechnology (CMI)
- 10th will be organized by the CMI on May 19th, 2009

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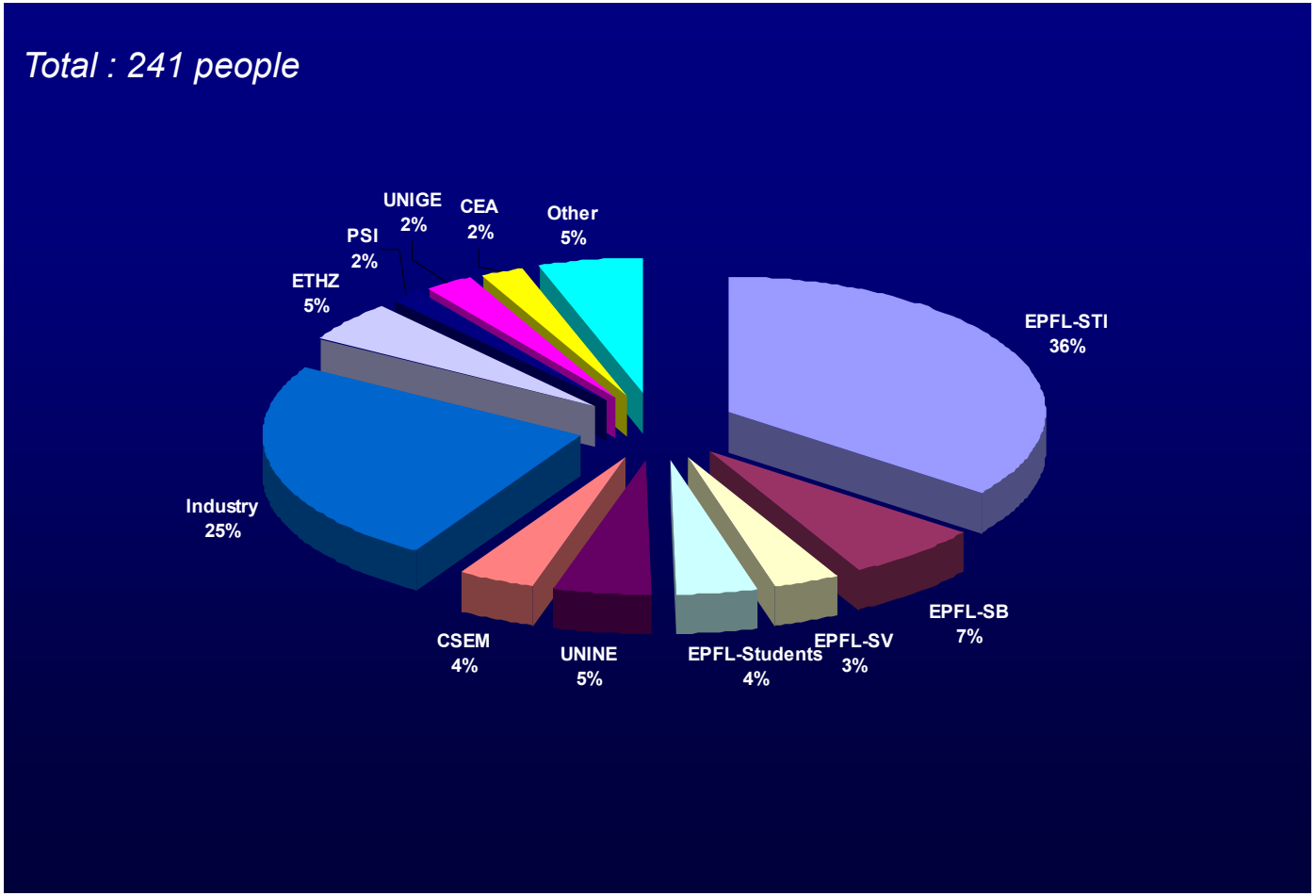
Thank You !

Many thanks:

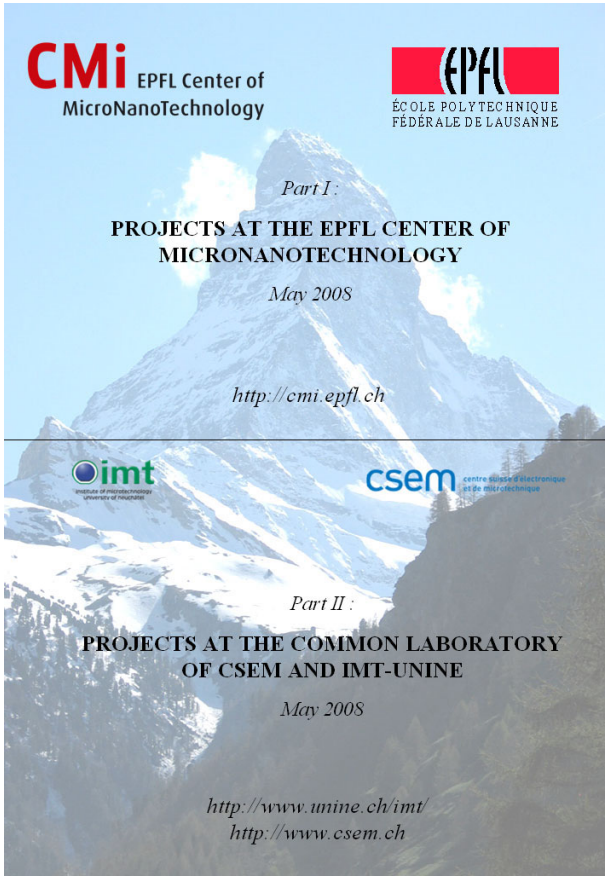
- Many thanks to the speakers of today
- Many thanks to the users of the CMI and the COMLAB for submitting 128 abstracts
- Many thanks to Claudia and Karine for the great job in organizing this meeting
- Many thanks to the EPFL which is strongly supporting the CMI
- And last but not least thank you to all of you for being here today

Participants (as of May 16th, 2008)

Total : 241 people



Abstracts



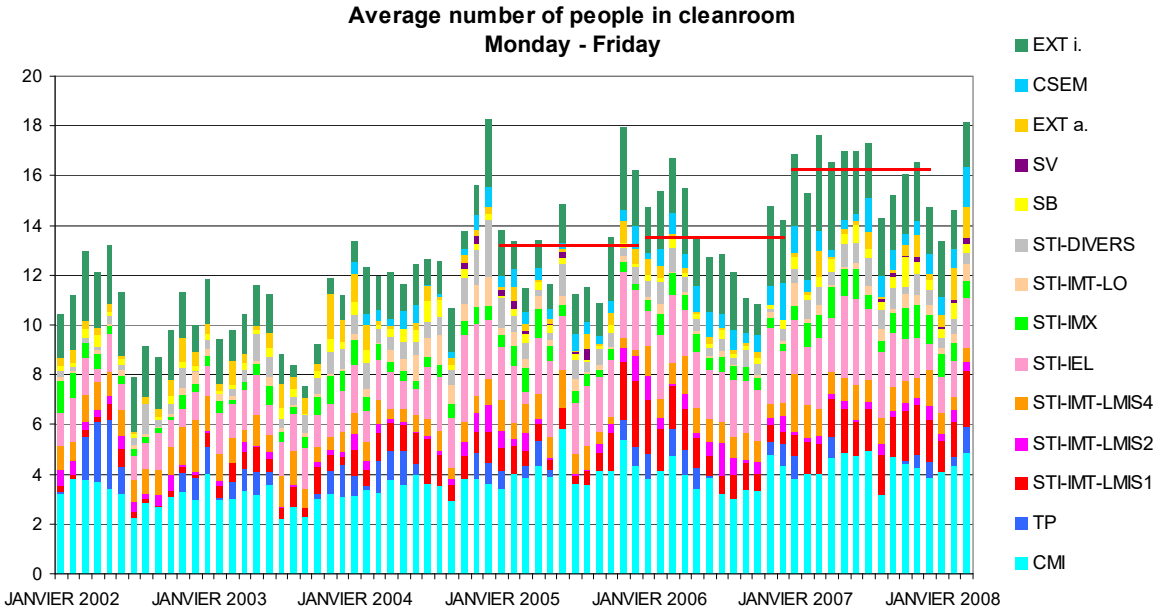
SB-IPEQ-LPN-Kapon	1
SB-IPEQ-LOEQ-Deveaud	1
SB-IPEQ-LASPE-Grandjear	1
SB-IPMC-LNNME-Forro	1
SB-IPMC-LCB-Meister	1
SB-ISIC-LEPA-Girault	1
SV-IBI-UPLUT-Lutolf	2
UNINE-IMT-OPTICS-Herzig	1
UNINE-IMT-ESPLAB-Farine	1
UNIGE	1
BOSTON-UNIVERSITY	1
CEA-VALDUC	1
ETHZ	1
STI-IGM-LENI-Favrat	1
STI-ITOP-NAM-Martin	2
STI-IMT-LO-Psaltis	1
STI-IMT-LOB-Lasser	1
STI-IMT-LOA-Salathé	3
STI-IMT-LSRO2-Calvel	1
STI-IMT-LMTS-Shea	4
STI-IMT-LMIS3-Popovic	1
STI-IMT-LMIS4-Renaud	12
STI-CMI-Renaud	1
STI-IMT-LMIS2-Gijs	6
STI-IMT-LMIS1-Brugger	14
STI-IEL-LSM-Leblebici	3
STI-IEL-LSI-De Micheli	1
STI-IEL-LEG2-Ionescu	14
STI-IMX-LTC-Manson	1
STI-IMX-LC-Muralt	9
CSEM	6
Private companies	18
Training of students	3
Total	**116**

IMT-de Rooij	9
CSEM	3
Total	**12**

The projects at CMI are driven by :

- 24 laboratories of EPFL (SB, SV, STI)
- 7 external laboratories
- 16 privates companies

CMI Cleanroom Average Occupancy

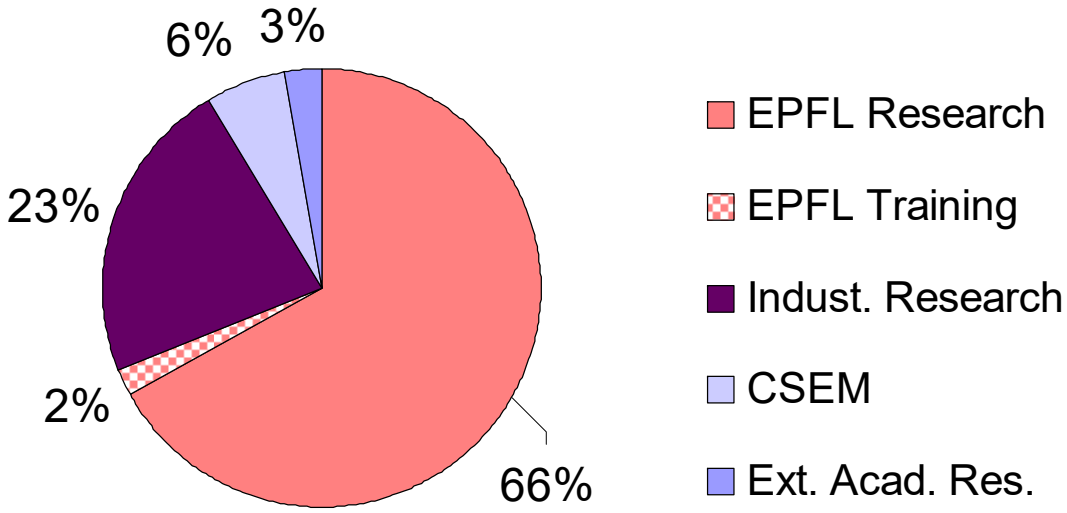


2005 : 13.3 people 8h/day
2006 : 13.7 people 8h/day
2007: 16.2 people 8h/day

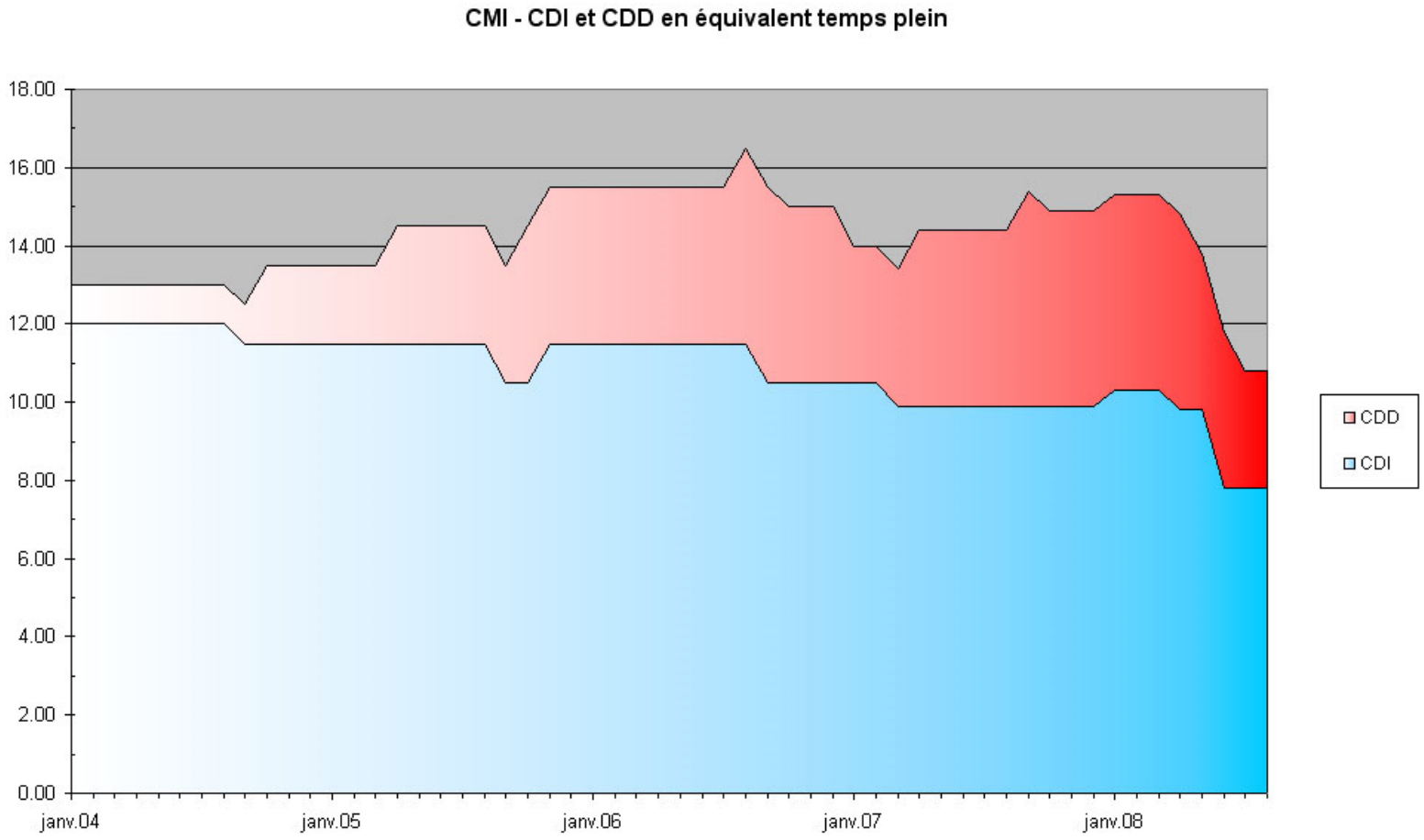
+ 18% in 2007 compared to 2006

CMI Cleanroom Activity (Staff Excepted)

Year 2007



CMI Staff


CMI - CDI et CDD en équivalent temps plein
18.00
16.00
14.00
12.00
10.00
8.00
6.00
4.00
2.00
0.00
janv.04
janv.05
janv.06
janv.07
janv.08
CDD
CDI

CMI Staff

Philippe Flückiger	Georges-André Racine	~~Pierrick Duvoisin~~ 30.06.2008	Jean-Baptiste Bureau 31.03.2011	~~Irène Magnenat~~ 31.05.2008
Claudia D'Agostino	Cyrille Hibert	Samuel Clabecq 30.09.2012		
	Philippe Langlet	Guy Clerc	Yvan Deillon	~~William Baer~~ 31.03.2008
	Kevin Lister 31.07.2010	~~Michael Pavius~~ 30.04.2008		
	Jean-Marie Voirol	Nareg Simonian 14.05.2013	~~Bertrand Rossler~~ 31.05.2008	~~Georges Brélaz~~ 31.08.2006

CMI Finances

- **CMI running costs in year 2007 (kCHF)**

	2006	2007
Infrastructure : energy, N2, water, maintenance (**covered by EPFL VPPL**)	754	811
Processing : consumables, maintenance of processing equipments	1'341	1'668
Salaries (covered by EPFL school of Engineering) :	1'208	1'253
TOTAL	**3'303**	**3'732**

+13% in 2007 compared to 2006

- **CMI resources in year 2007 (kCHF)**

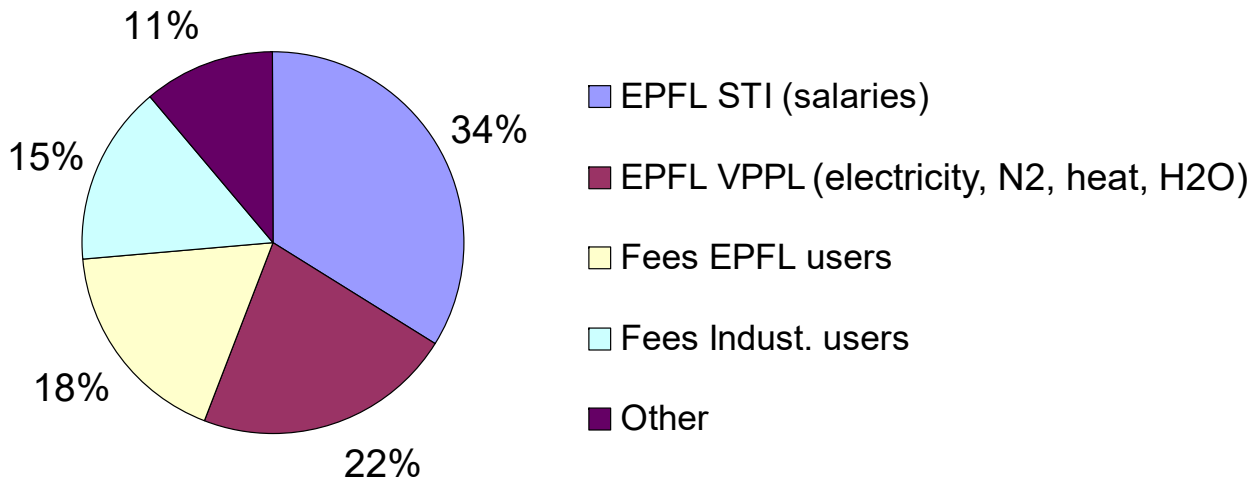
	2006	2007
CMI **Users' Fees** (consumables) and CMI Services Revenues	1'365	1'627
TOTAL	**1'365**	**1'627**

19% in 2007 compared to 2006

Not included in this table are:
- the new investments
- the costs of the amortization

CMI Running Cost Coverage

Year 2007



CMI Inventory

- **Inventory 2008 in kCHF**

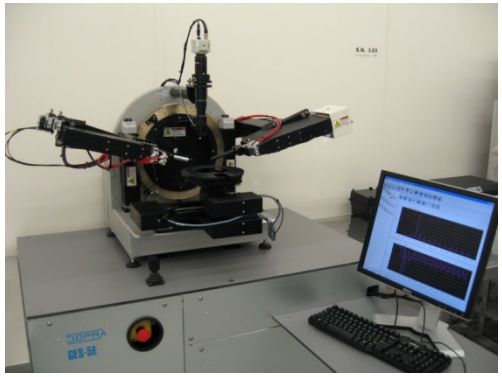
Infrastructure	13’000
Scientific Equipment	21’000
TOTAL	**34’000**

More than 70 pieces of equipment up-and-running with very high uptime

CMI New tools

Spectroscopic Ellipsometer:

- Sopra GES 5E



Parylene Coating System:

- Comelec C-30-S

Our future: CMI+

Introduction:

- Since its opening in 1999, CMI has constantly increased its volume of activity
- CMI helped to raise EPFL to an internationally recognized position in MicroNanoTechnology

Trend in MicroNanoTechnologies:

- New processes in combination with already established miniaturization processes
- New chemistry, bottom-up approach, self-assembly, new materials, …

CMI+ concept:

- Anticipate the needs of researchers, especially from the schools of life sciences and basic sciences
- Radical evolution of CMI
- Provide a broad technology platform continuously covering technologies from processing of silicon wafers up to bio-physico-chemical nanotechnology processes on various substrates
- Avoid a “technology gap“ which is currently perceived when researchers, after finishing the wafer scale processing are scattered in their own labs to finish the processes in non optimal conditions

Our future: CMI+

CMI+ concept (continued):

- Build a new grey room area of less sophisticated environment with more flexible usage
- More freedom, less support
- Small specialized equipment and common characterization tools

The advantages of CMI+ are the same as for CMI:

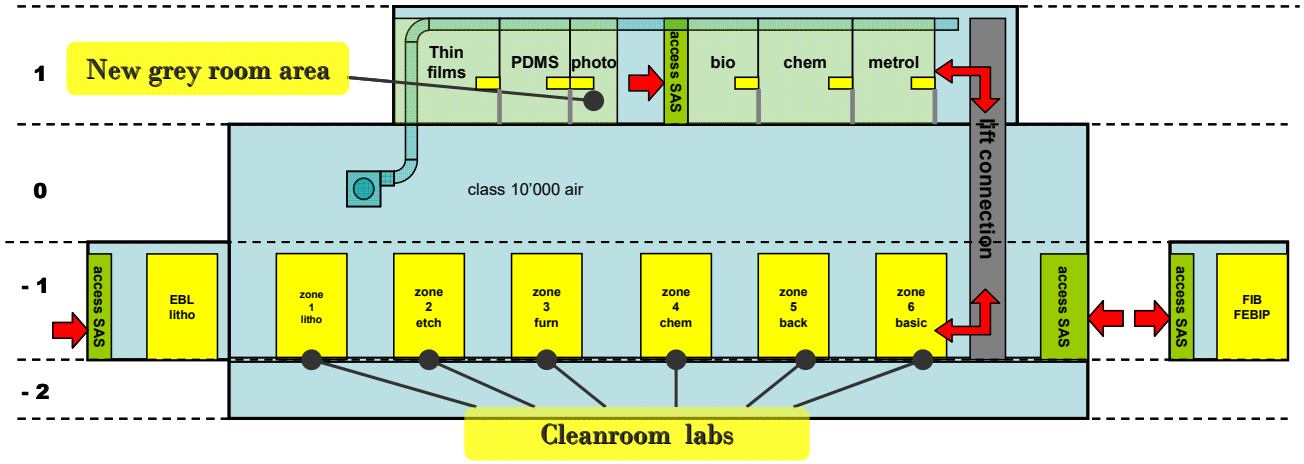
- Promote shared use of the machines
- Ensure well maintained infrastructure
- Reduce costs
- Improve sharing of competencies between users
- Help better communication
- Optimize lab space use in BM building…

Our future: CMI+

Cross section view of CMI+:

CMI+ will be composed of two interconnected infrastructures

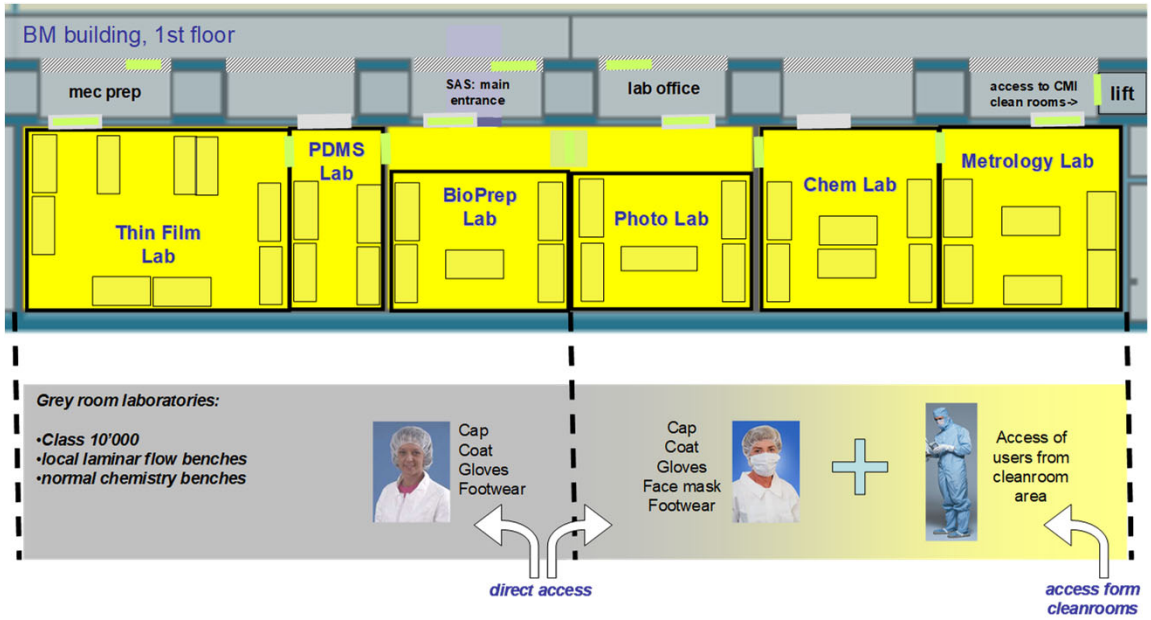
- (1) The cleanroom lab which is focused on wafer scale processing (existing cleanrooms)
- (2) The new shared lab that will consist of grey room laboratory space



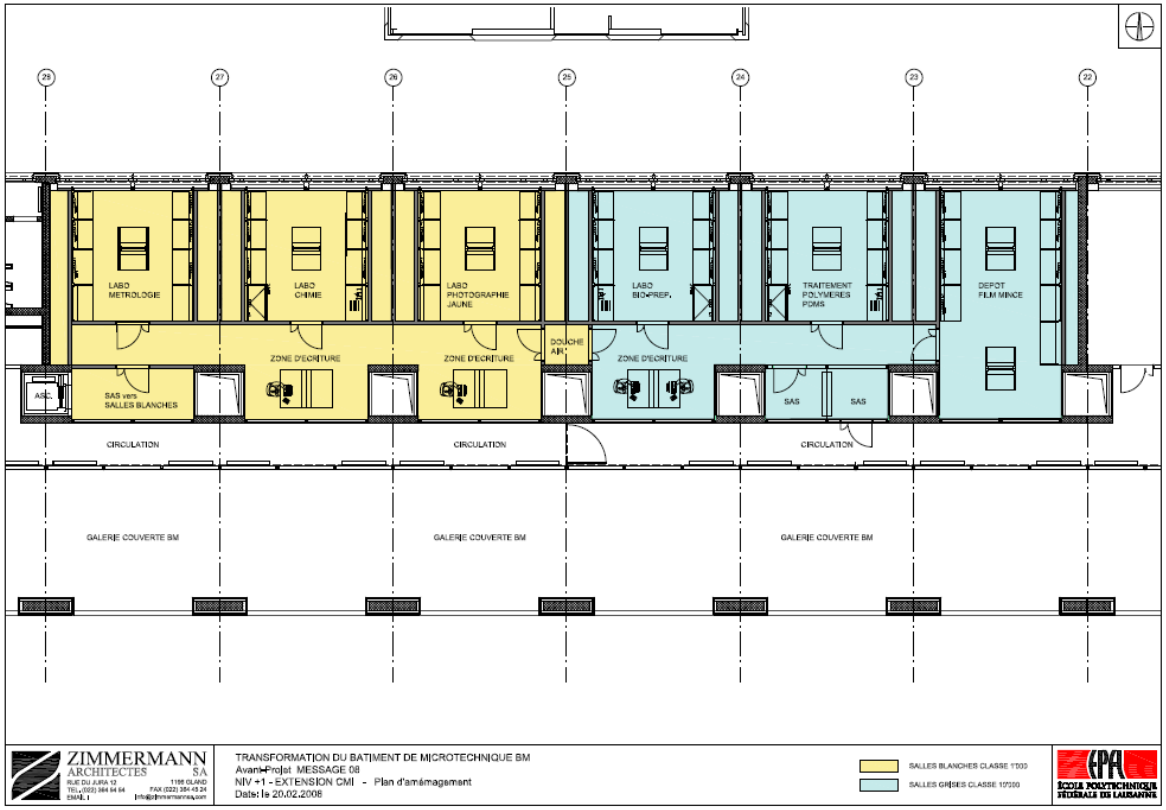
Our future: CMI+

Layout of CMI+:

- A dual access either from cleanroom lab or from outside (24h/24h)
- Some common zones of access
- A gradient of cleanness and dressing specifications



Our future: CMI+



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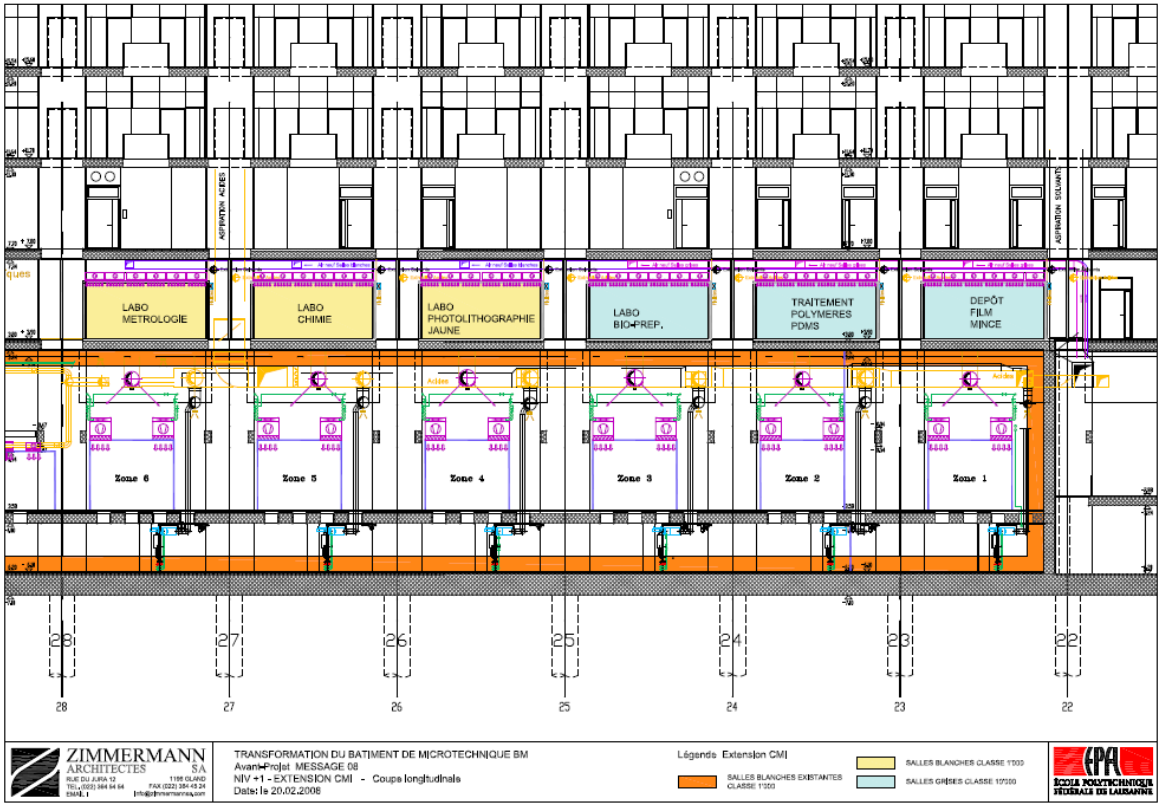
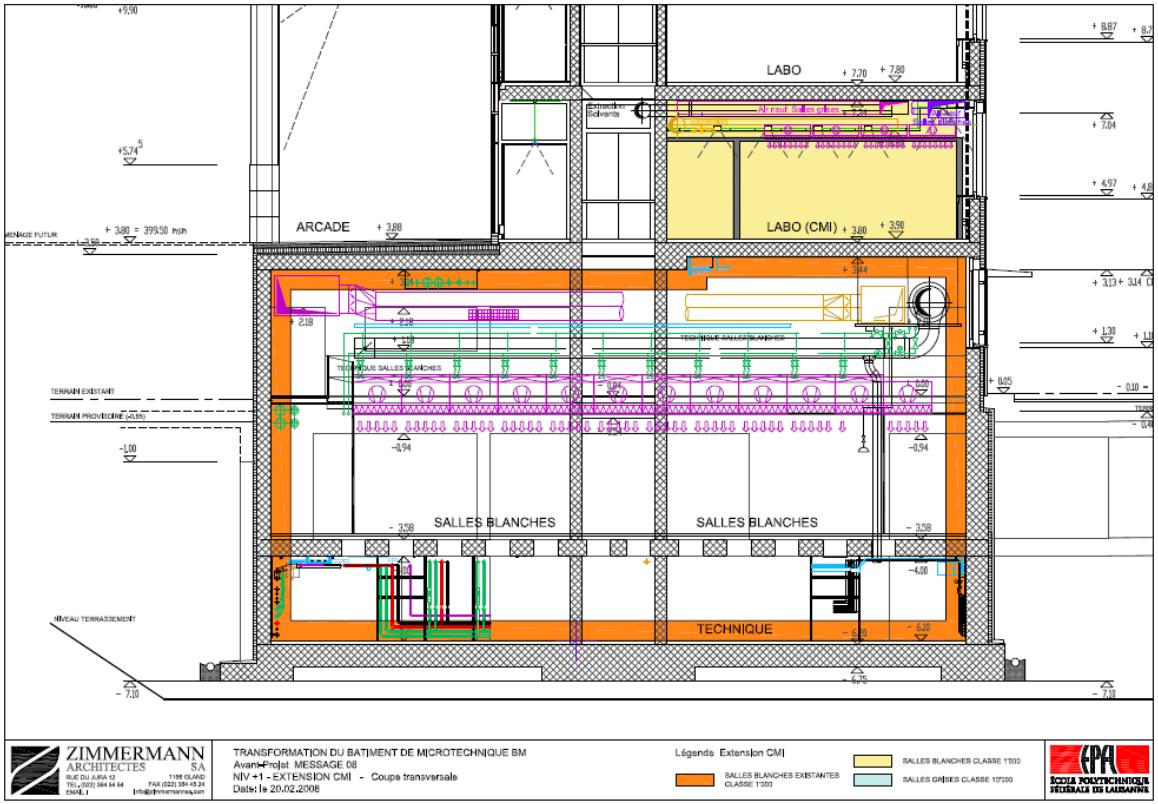
Our future: CMI+



Our future: CMI+



Conclusions

- We would appreciate to get all your inputs about your specific needs for CMI+

About the Conference …

- 10h20-10h40 ***J. Gobrecht*** *(PSI)*, Micro-/Nanofabrication at PSI: Recent Highlights
- 10h40-11h00 ***B. Dwir*** *(LPN)*, Advanced Photonic Nanostructures
- 11h00-11h20 ***J. Brugger*** *(LMIS)*, Stencil Lithography and other Micro/Nanoengineering Innovations in and around CMI
- 11h20-11h40 **Break**
- 11h40-12h00 ***H.-P. Herzig*** *(UNINE)*, From Micro to Nano - Silicon Based Optical Sensors
- 12h00-12h15 ***J. Baborowski*** *(CSEM)*, Piezoelectrically Activated Silicon Resonators
- 12h15-12h30 ***J.-M. Wismer*** *(Sensimed)*, MEMS Integration for Medical Applications
- **12h30-14h00 Lunch & Poster Session**
- 14h00-14h15 ***S. Kobel*** *(LSCB)*, Micropatterning Biomimetic Hydrogels as Model Microenvironments for Stem Cells
- 14h15-14h30 ***A. Vasdekis*** *(LO)*, Fabrication for Optofluidics
- 14h30-14h45 ***N. Curtz*** *(UNIGE)*, Nanopatterning Superconducting Thin Films with the FIB for Photon Detection
- **14h45-15h00 Break**
- 15h00-15h15 ***R. Krpoun*** *(LMTS)*, Microfabricated Arrays of Electrospray Sources for Spacecraft Propulsion
- 15h15-15h30 ***M. Moridi*** *(UNINE)*, Microfabricated Biointerface with High Density Microelectrode Array and Photonic Detectors
- **15h30-16h30 Cocktails & Poster Session**

1 invited talk from PSI 10 talks involving CMI, COMLAB and IPEQ

Enjoy your Conference !

- Thank you for your attention and enjoy your conference