



EPFL

EPFL MicroNanoFabrication Annual Review Meeting 25<sup>th</sup> edition

# EPFL CMi - Center of MicroNanoTechnology



■ École  
polytechnique  
fédérale  
de Lausanne

VENUE & DATE

**STCC**  
12.05.2026

PRESENTED BY

**Philippe Flückiger**  
Director of Operations

**EPFL**

EVENT

# EPFL MicroNanoFabrication Annual Review Meeting

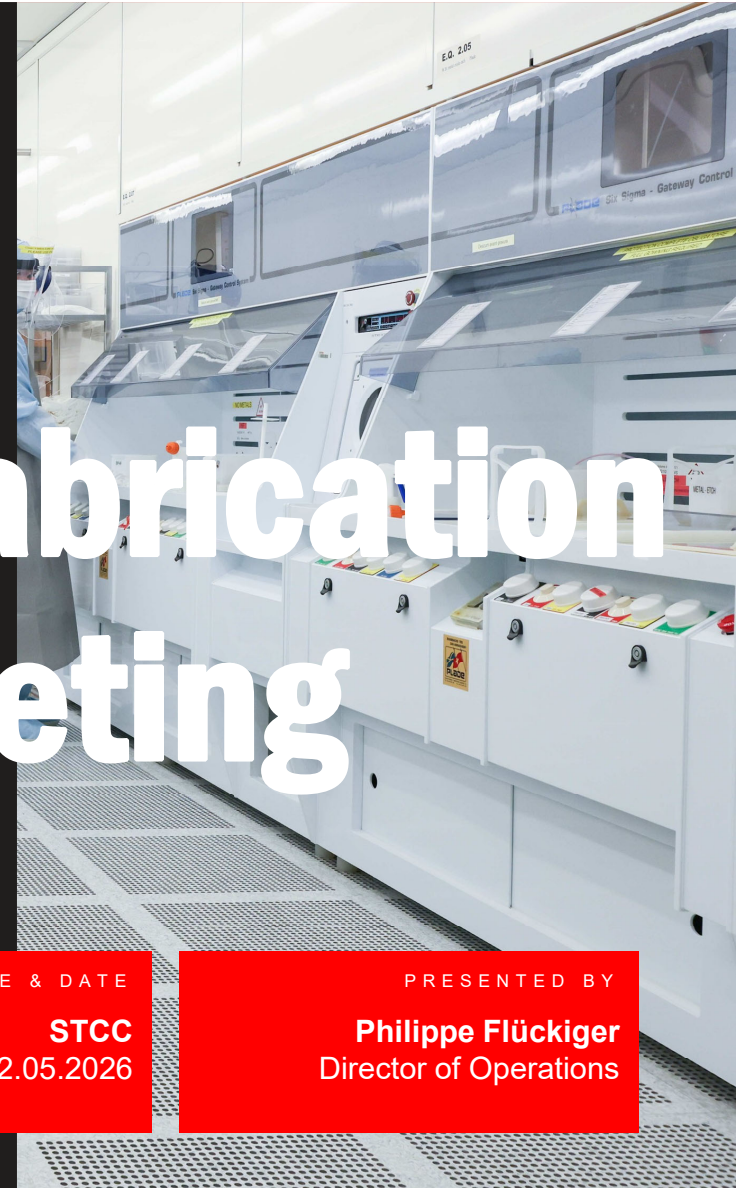
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# EPFL MicroNanoFabrication Annual Review Meeting

Next editions:	11.05.2027 – 26th edition	14.05.2030 – 29th edition	10.05.2033 – 32nd edition
	09.05.2028 – 27th edition	13.05.2031 – 30th edition	09.05.2034 – 23rd edition
	08.05.2029 – 28th edition	11.05.2032 – 31st edition	08.05.2035 – 34th edition

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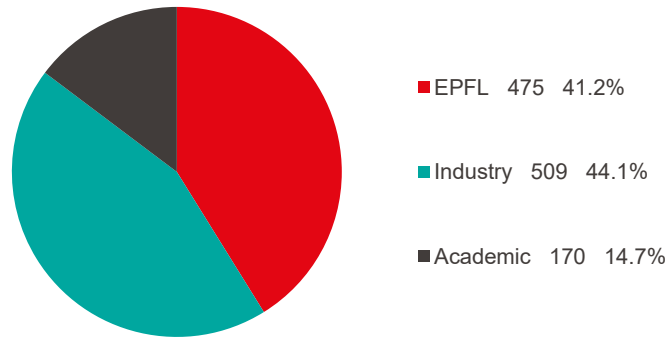
**Philippe Flückiger**  
Director of Operations



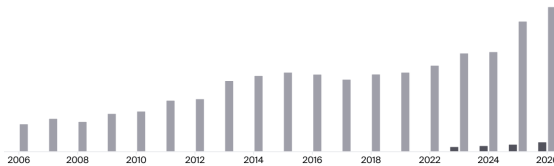
# Welcome & thanks

- Welcome to the 25<sup>th</sup> edition of the CMi MicroNanoFabrication Annual Review Meeting
- 1154 participants registered (with 44% from industry and 41% from EPFL)
- Many thanks for your participation

- Global companies
- Local industry
- Startups
- Suppliers
- Government Agencies
- Researchers
- Faculty members
- Students
- Colleagues from other academic cleanrooms



	949	(82.24%)
	71	(6.15%)
	55	(4.77%)
	13	(1.13%)
	10	(0.87%)
	10	(0.87%)
	8	(0.69%)
	7	(0.61%)
	6	(0.52%)
	5	(0.43%)
	4	(0.35%)
	2	(0.17%)
	2	(0.17%)
	2	(0.17%)
	1	(0.09%)
	1	(0.09%)
	1	(0.09%)
	1	(0.09%)
	1	(0.09%)
	1	(0.09%)
	1	(0.09%)



- The list of participants is available to everyone
- Traveling from 22 different countries
- Fantastic opportunity for networking



EPFL

OUTLINE

Users and Finances

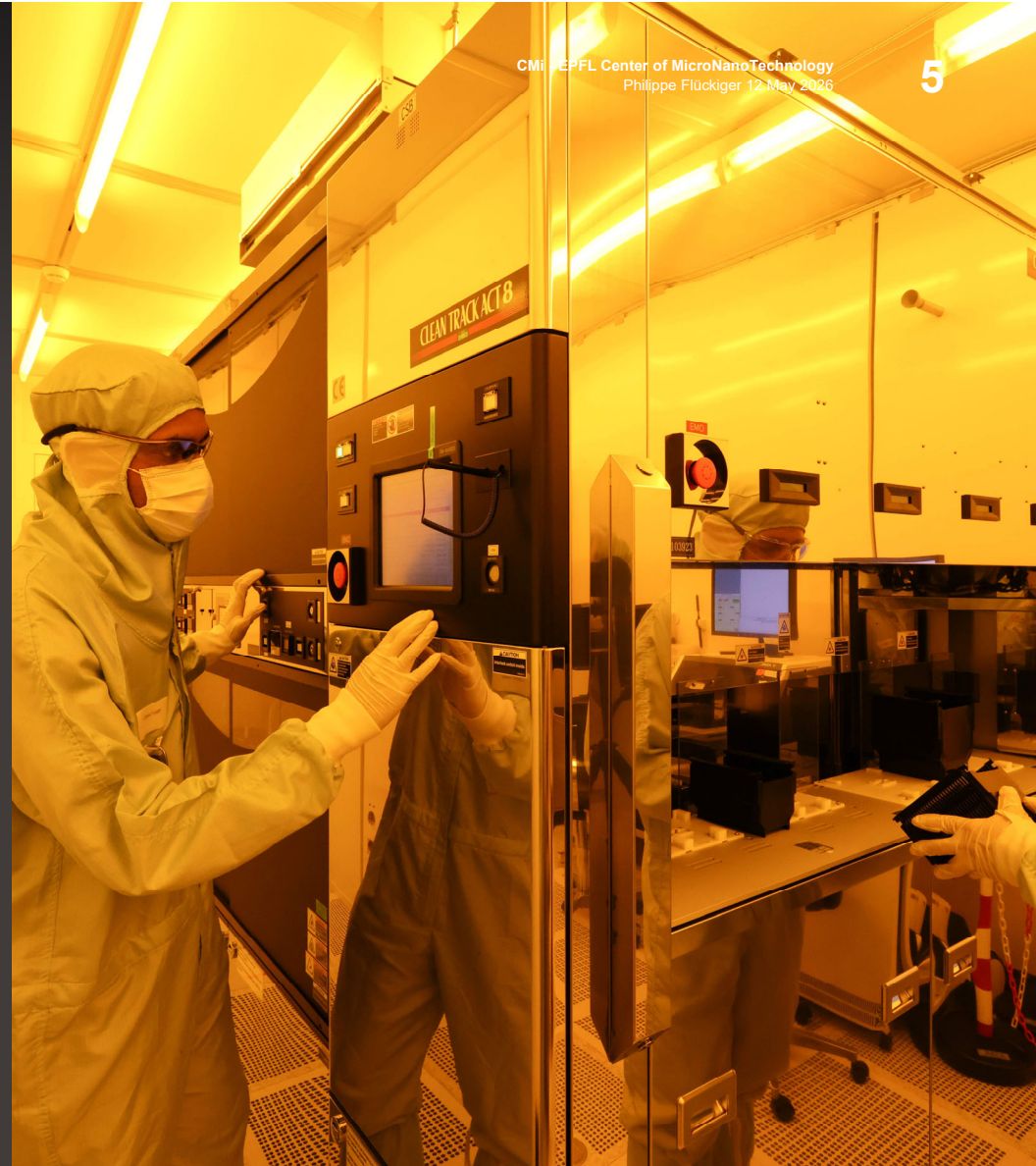
Governance

Staff

Tools

Cleanroom

Projects



# USERS IN 2025

Engineering Sc.		Basic Sc.	EPFL various	Ext. Acad.		Companies		
STI-IBI-BIOS	STI-IGM-EMSI	SB-IPHYS-ELEC	Life Sciences	AMI_FR_BioPhysics	Eidikos Logariasmos Kondilion	Advanced Fiber Resources	Lunaphore	Spryns
STI-IBI-CLSE	STI-IGM-ETA-LAB	SB-IPHYS-GR-GA	SV-BMI-UPLAMANNO	CERN_EP_dept	Kyoto University	Alemnis	Luxtelligence	Swissflex Microcircuits
STI-IBI-LBEN	STI-IGM-INSTANT-L	SB-IPHYS-HQC	SV-GHI-UPKIN	CHUV_CRISP	Koç University	Alpes Lasers	Mackinac	Sy&Se
STI-IBI-LBMM	STI-IGM-LNET	SB-IPHYS-LASPE	SV-IBI-UPDEPLA	CSEM_T1	University of Sussex	Annaida	Magnetfab	TAG Heuer
STI-IBI-LBNC	STI-IGM-LRESE	SB-IPHYS-LPBS	SV-IBI-UPLUT	CSEM_T4		Axetris	MCH-processing	XRnanotech
STI-IBI-LBNI	STI-IGM-MICROBS	SB-IPHYS-LPHE-OS	SV-IBI-UPNAE	CSEM_T5	CH-SCNAT-ETHZ_LFKP	Biosch	Melexis	Xsensio
STI-IBI-LHTC	STI-IGM-NEMS	SB-IPHYS-LPL	SV-ISREC-UPGON	CSEM-Allschwil	CH-SCNAT-UNIGE_GAP	Bruker	MicroElectroDevices MED	
STI-HEM-ALCHEMY	STI-IMX-FIMAP	SB-IPHYS-LPQM1	SV-ISREC-UPKARTHAUS	ETHZ_D-BSSE_QDB	CH-SCNAT-UNIGE_Physi	Bühler	Miraex	CH-SCNAT-FemtOprint
STI-HEM-AQUA	STI-IMX-INE	SB-IPHYS-LQP	SV-ISREC-UPRAD	ETHZ_D-ITET_JEF		Confovis	Morphotonix	CH-SCNAT-Hexisense
STI-HEM-BION	STI-IMX-LMGN	SB-IPHYS-LSME		ETHZ_D-ITET_Neuro		Corintis	Nanoworld	CH-SCNAT-Miraex
STI-HEM-GALATEA	STI-IMX-LMOM	SB-IPHYS-LUMES		ETHZ_D-MAVT_IJEP_		Creal	Neurosoft Bioelectronics	
STI-HEM-HYLAB	STI-IMX-LMSC	SB-IPHYS-SQIL	Architecture, Civil and	ETHZ_D-PHYS_IQE		Deeplight	Novagan	
STI-HEM-LAFT	STI-IMX-LP	SB-ISIC-LAS	Environmental Engineering	ETHZ_D-PHYS_LFKP		Edwatec	Oxford Ionics Limited	
STI-HEM-LAI	STI-IMX-SMAL	SB-ISIC-LCS	ENAC-IIC-AS	HE_Arc_Le_Locle		FEMTOprint	Parithera	
STI-HEM-LANES	STI-IMX-SML	SB-ISIC-LNCE	ENAC-IIE-GR-LUD	HES-SO-GE_inSTI		Focuslight	Piemacs	
STI-HEM-LAPD	STI-INX-CHEMINA	SB-ISIC-LNQ		HES-SO-NE_HEARC		FoXmat	Q.ANT	
STI-HEM-LEAP	STI-INX-LSBI	SB-ISIC-LPDC		Metas		Freshape	Quantum Brand Protection	
STI-HEM-LMIS1	STI-SCI-AXS	SB-ISIC-LPI	Centers and Platforms	PSI_LNQ		Gersteltec	Richemont	
STI-HEM-LPMAT	STI-SEL	SB-ISIC-LSCI	AVP-CP-ECO	PSI_TOMAC		Hexisense	Richemont (2)	
STI-HEM-LPQM2	STI-SMT-GE	SB-SCI-RH	VPA-VP-APR	UNIFR_Chemistry		IBM Research	Rolex	
STI-HEM-LWE	STI_SMT-TP1	SB-SPC-II		UNIGE_DPNC		ID Quantique	Safran Timing Technologies	
STI-HEM-NAM	STI_SMT-TP2			UNIGE_DQMP		II-VI Laser Enterprise	SamanTree Medical	
STI-HEM-NANOLAB				UNIGE_GAP		Indie	Senbiosys	
STI-HEM-PHOSL				UNIGE_Physique		Inf.BR Treinamento e Serços	Sigatec	
STI-HEM-POWERLAB				UNIL_GTF		Ligentec	SM-ABDAD Consulting	
STI-HEM-PV-LAB				UNINE		Lightium	Snap WaveOptics	
STI-HEM-SCI-SC				UNIZH_IBT		LSPR	SoHHytec	
49 (379)		21 (132)	12 (18)	34 (57)		63 (158)		

↑ # of laboratories  
↑ # of users

- Total: 654 users belonging to 179 laboratories or companies
- Each cell represents a laboratory headed by a Professor (STI/SB/SV/IC/ENAC)

# USERS IN 2025

Engineering Sc.		Basic Sc.		EPFL various	Ext. Acad.		Companies		
STH-IBI-BIOS	STH-IGM-EMSI	SB-IPHYS-ELEC	Life Sciences	AMI_FR_BioPhysics	Eidikos Logariasmos Kondilion	Advanced Fiber Resources	Lunaphore	Spryngs	
STH-IBI-FA-LAB	SB-IPHYS-OR-GA	SV-BMI-UPLAMANNO		CERN_EP_dept	Kyoto University	Alemnis	Luxtelligence	Swissflex Microcircuits	
STH-IBI-FA-LAB	SB-IPHYS-OR-GA	SV-BMI-UPLAMANNO		CHUV_CRISP	Koç University	Alpes Lasers	Mackinac	Sy&Se	
STH-IBI-FA-LAB	SB-IPHYS-OR-GA	SV-BMI-UPLAMANNO		CSEM_T1	University of Sussex	Annaida	Magnetfab	TAG Heuer	
STH-IBI-FA-LAB	SB-IPHYS-OR-GA	SV-BMI-UPLAMANNO		CSEM_T4		Axetris	MCH-processing	XRnanotech	
STH-IBI-LBNI	STH-IGM-EMSI	SB-IPHYS-OR-GA		CSEM_T5	CH-SCNAT-ETHZ_LFKP	Biosch	Melexis	Xsensio	
STH-IBI-LHTC	STH-IGM-NEMS	SB-IPHYS-LPL	SV-ISREC-UR	CSEM-Allschwil	CH-SCNAT-UNIGE_GAP	Bruker	MicroElectroDevices MED		
STH-IEM-ALCHEMY	STH-IMX-FIMAP	SB-IPHYS-LPQM1	SV-ISREC-UR	ETHZ_D-BSSE_QDB	CH-SCNAT-UNIGE_Physi	Bühler	Miraex	CH-SCNAT-FemtOprint	
STH-IEM-AQUA	STH-IMX-LAPD	SB-IPHYS-LQP	SV-ISREC-UR	ETHZ_D-ITET_JEF		Confovis	Morphotonix	CH-SCNAT-Hexisense	
STH-IEM-BION	STH-IMX-LAPD	SB-IPHYS-LSME	Swiss Inst. for experimental cancer research	ETHZ_D-ITET_Neuro		Corintis	Nanoworld	CH-SCNAT-Miraex	
STH-IEM-GALATEA	STH-IMX-LAPD	SB-IPHYS-LUMES		ETHZ_D-MAVT_JEPE	CERN CSEM PSI EMPA ETHZ Universities	Creal	Neuroelectronics		
STH-IEM-HYLAB	STH-IMX-LAPD	SB-IPHYS-SQIL	Architectural	ETHZ_D-PHYS_IOE		Deeplight	Nova	Startups SMEs Large enterprises	
STH-IEM-LAFT	STH-IMX-LAPD	SB-IPHYS-SQIL	Architectural	ETHZ_D-PHYS_LFKP		Edwatec	Oxiflex		
STH-IEM-LAI	STH-IMX-SMAL	SB-ISIC-LPI	Chemical Sciences and Engineering	HE_Arc_Le_Locle		FEMTOprint	Pariflex		
STH-IEM-LANES	STH-IMX-SMAL	SB-ISIC-LPQ	Chemical Sciences and Engineering	HES-SO-GE_inSTI		Focuslight	Pierrelux		
STH-IEM-LAPD	STH-IMX-CHEMINA	SB-ISIC-LPQ	Chemical Sciences and Engineering	HES-SO-NE_HEARC		FoXmat	Q.ANT		
STH-IEM-LAPD	STH-IMX-LAPD	SB-ISIC-LPQ	Chemical Sciences and Engineering	Metas		Freshape	Quantum Brand Protection		
STH-IEM-LAPD	STH-IMX-LAPD	SB-ISIC-LPQ	Chemical Sciences and Engineering	PSI_LNQ		Gersteltec	Richemont		
STH-IEM-LAPD	STH-IMX-LAPD	SB-ISIC-LPQ	Chemical Sciences and Engineering	PSI_TOMAC		Hexisense	Richemont (2)		
STH-IEM-LAPD	STH-IMX-LAPD	SB-ISIC-LPQ	Chemical Sciences and Engineering	UNIFR_Chemistry		IBM Research	Rolex		
STH-IEM-LAPD	STH-IMX-LAPD	SB-ISIC-LPQ	Chemical Sciences and Engineering	UNIGE_DPNC		ID Quantique	Safran Timing Technologies		
STH-IEM-LAPD	STH-IMX-LAPD	SB-ISIC-LPQ	Chemical Sciences and Engineering	UNIGE_DQMP		II-VI Laser Enterprise	SamanTree Medical		
STH-IEM-LAPD	STH-IMX-LAPD	SB-ISIC-LPQ	Chemical Sciences and Engineering	UNIGE_GAP		Indie	Senbiosys		
STH-IEM-LAPD	STH-IMX-LAPD	SB-ISIC-LPQ	Chemical Sciences and Engineering	UNIGE_Physique		Inf.BR Treinamento e Serços	Sigatec		
STH-IEM-POWERLAB	STH-IMX-LAPD	SB-ISIC-LPQ	Civil & Environmental Engineering	UNIL_GTF		Ligentec	SM-ABDAD Consulting		
STH-IEM-PV-LAB	STH-IMX-LAPD	SB-ISIC-LPQ	Civil & Environmental Engineering	UNINE		Lightium	Snap WaveOptics		
STH-IEM-SCI-SC	STH-IMX-LAPD	SB-ISIC-LPQ	Civil & Environmental Engineering	UNIZH_IBT		LSPR	SoHHytec		
49 (379)		21 (132)		12 (18)		34 (57)		63 (158)	

↑ # of laboratories  
↑ # of users

- The EPFL laboratories using the CMI belong to 10 EPFL institutes
- External : CERN CSEM EMPA ETHZ UNI (CH and other) + Small SME Global

# USERS

650 / 12 months



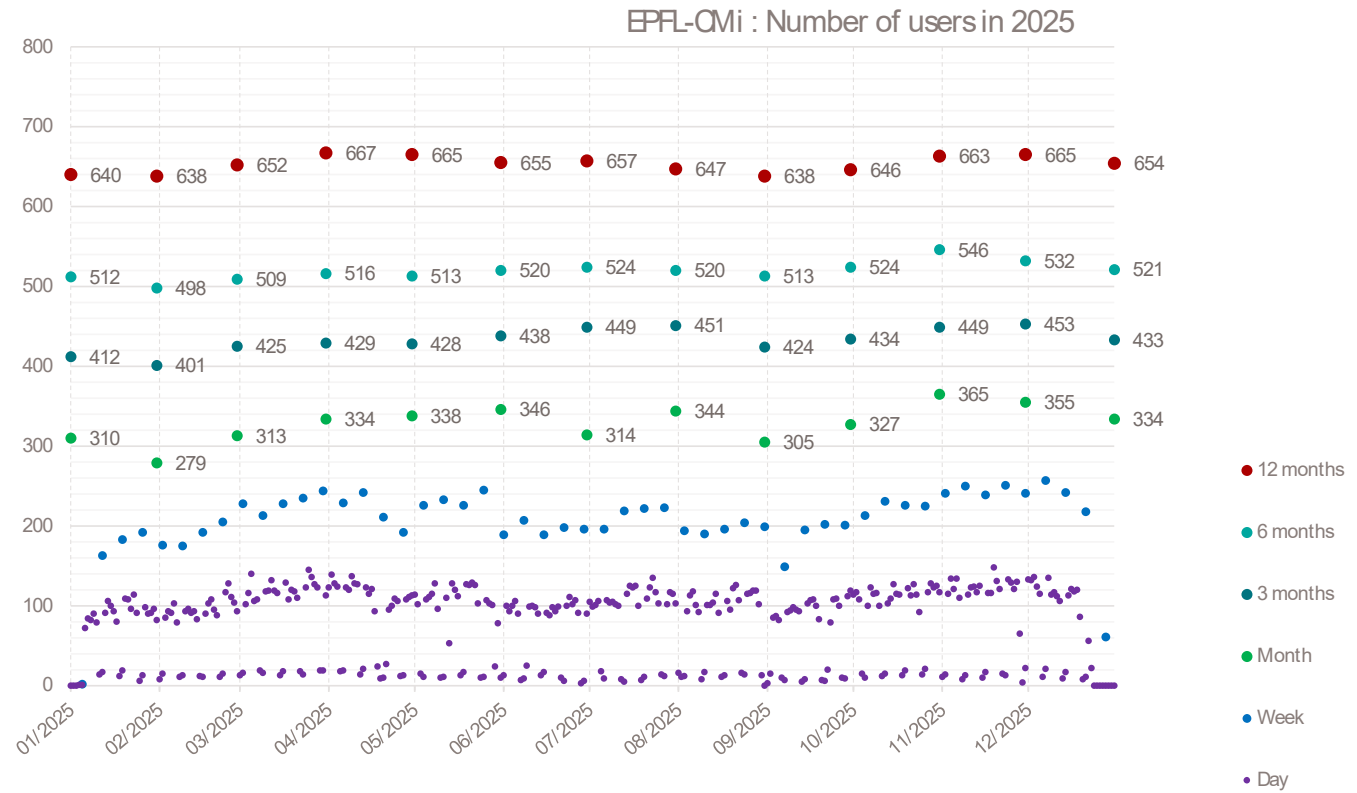
320 / month



200 / week



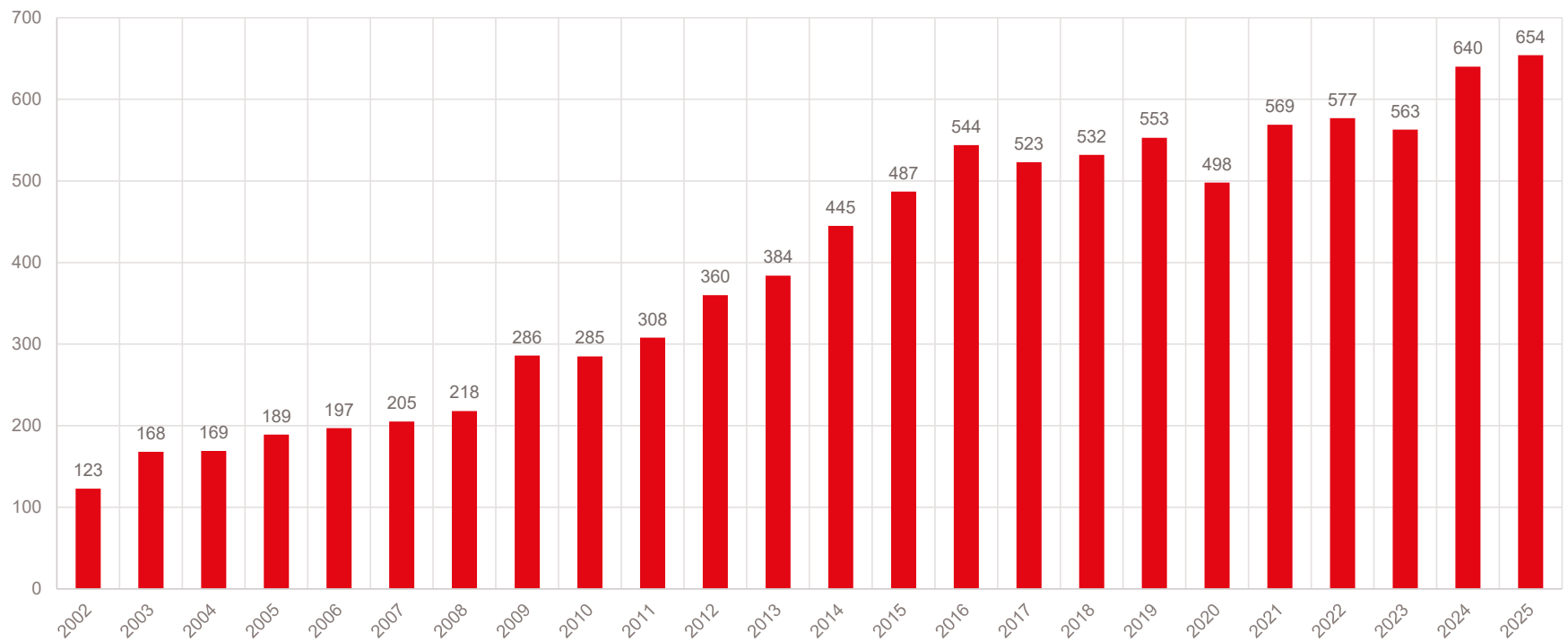
100 / day



- The number of users is rather stable over the year

# USERS

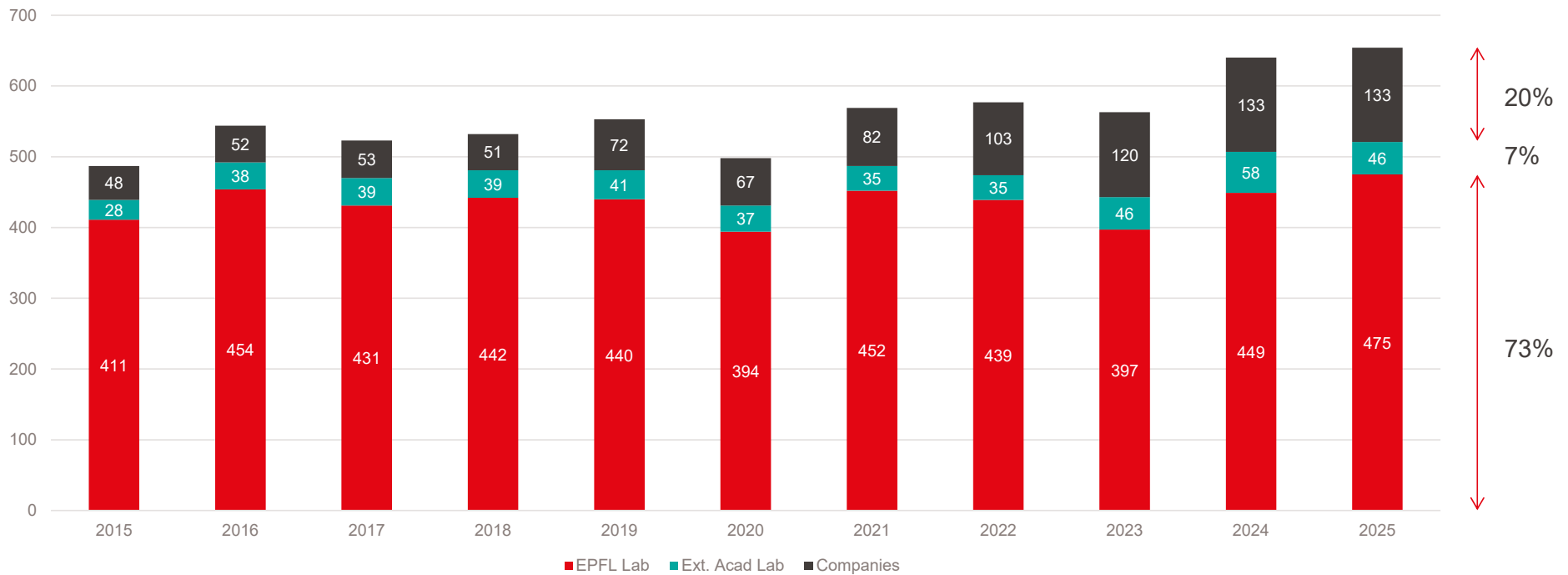
EPFL-CMi : Number of users



- Evolution of the number of users over the years since 2002
- From 100 to 600 users. New record in 2025 (+2%)

# USERS

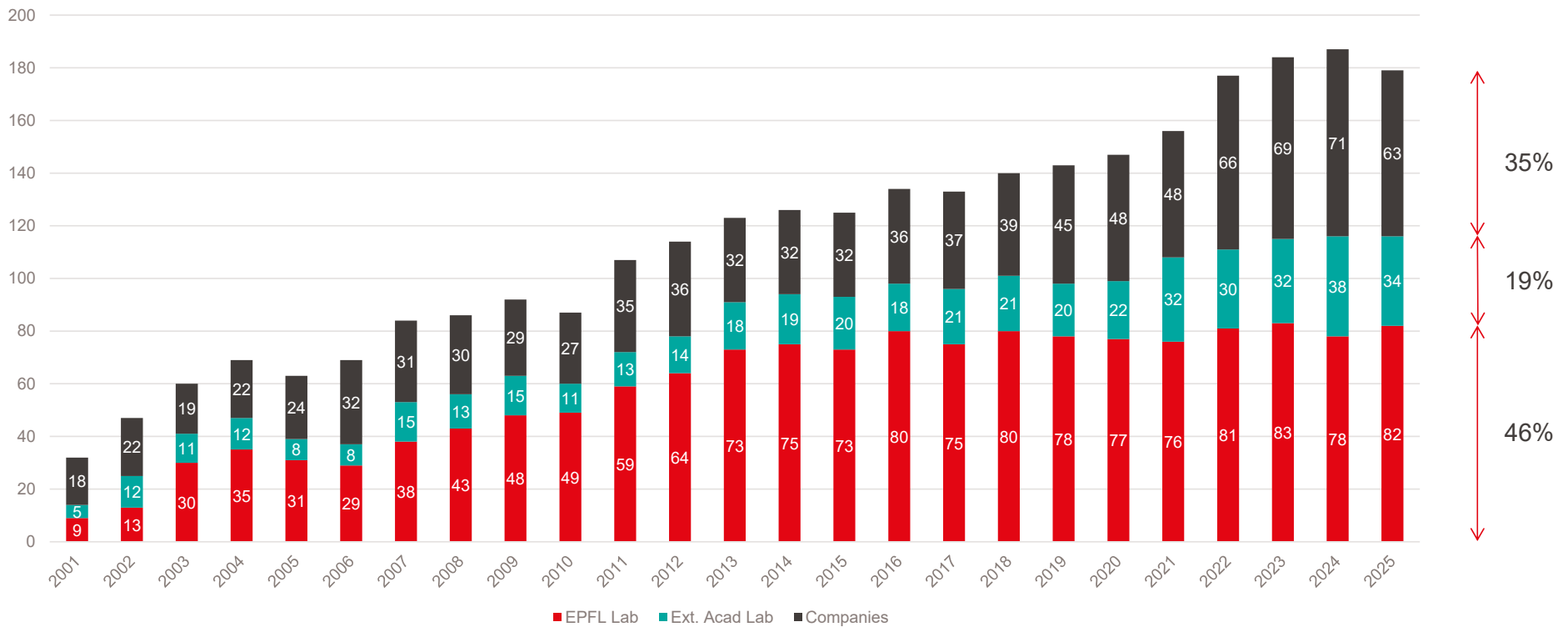
EPFL-CMi : Number of users



- The number of users per affiliation since 2015
- 73% of our users are from EPFL and 20% are from industry

# CLIENTS

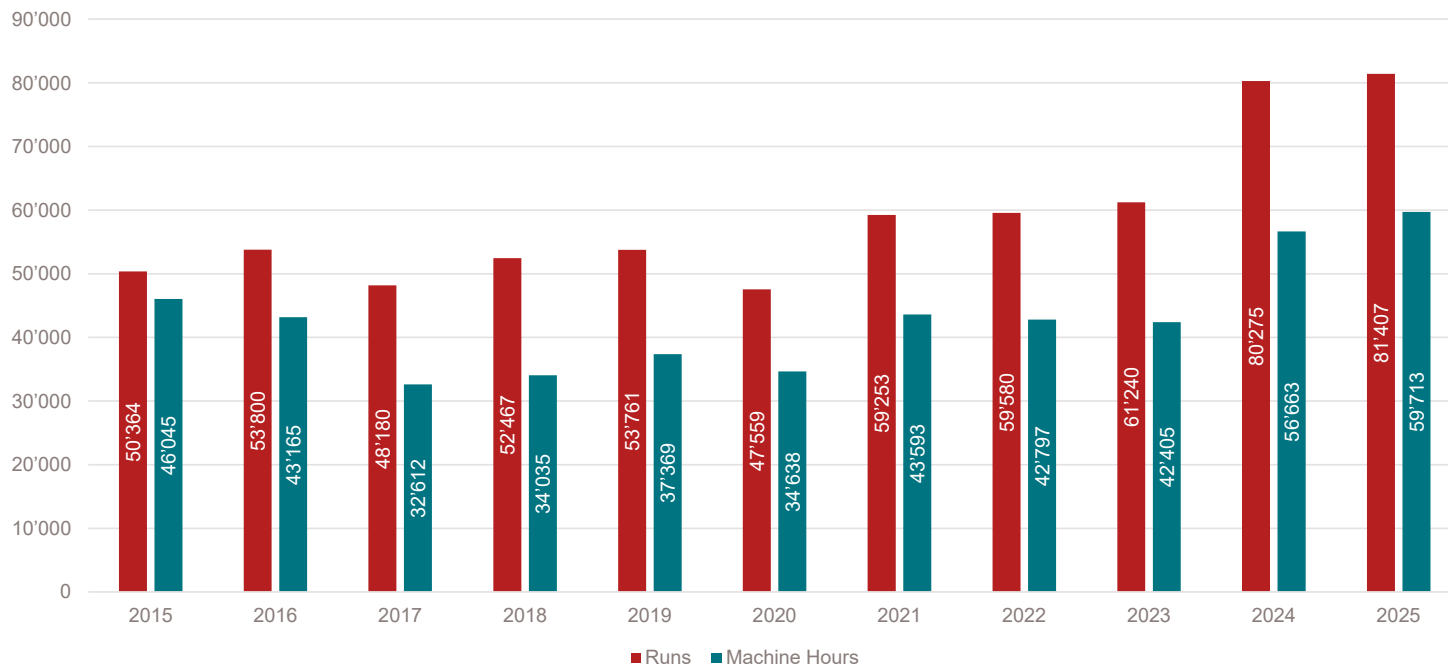
EPFL-CMi : Number of clients



- The number of clients per affiliation since 2001
- Client = EPFL Labs, External Academic Labs, Companies

# USAGE

EPFL-CMi : Usage

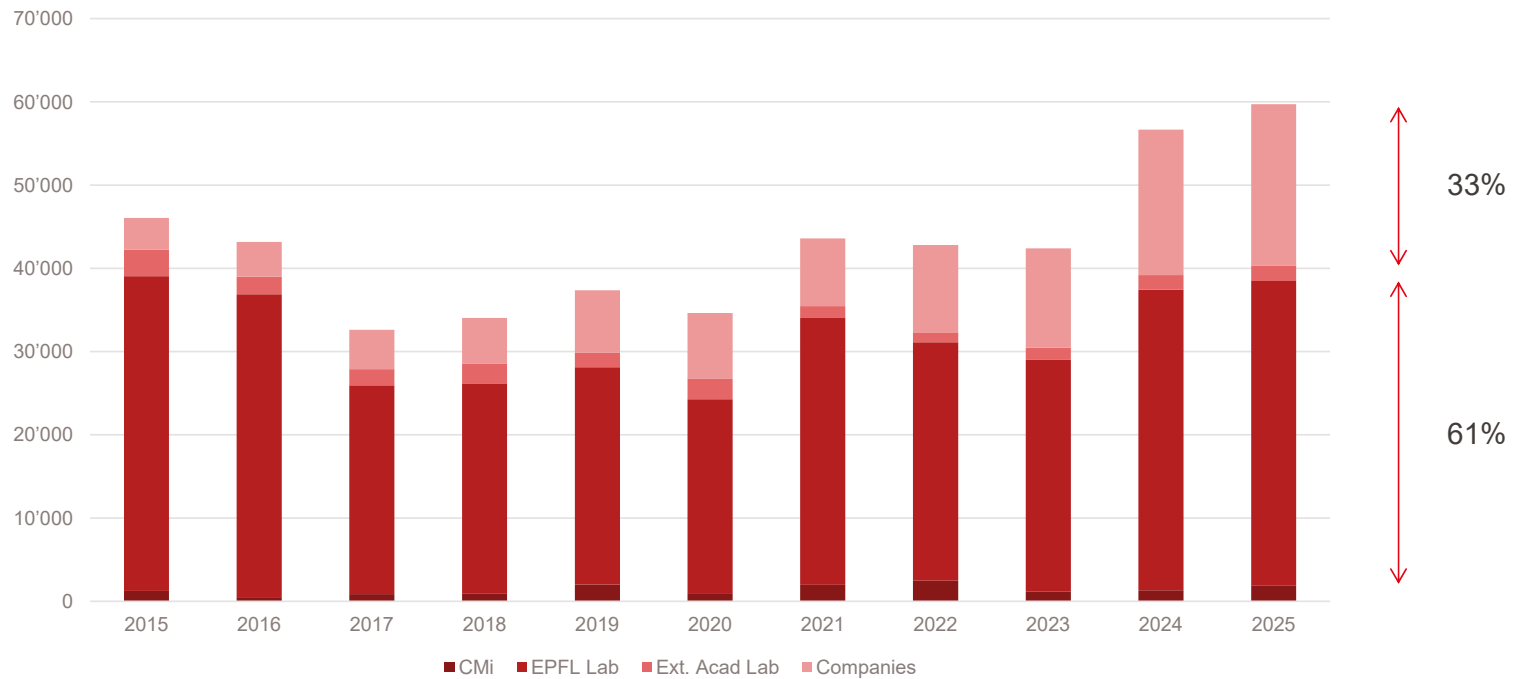


- The users generated 81 thousand runs and 60 thousand machine hours in 2025

# USAGE

Companies :  
Sales = 48%  
Usage = 33%

EPFL-CMi : Billed Machine Hours

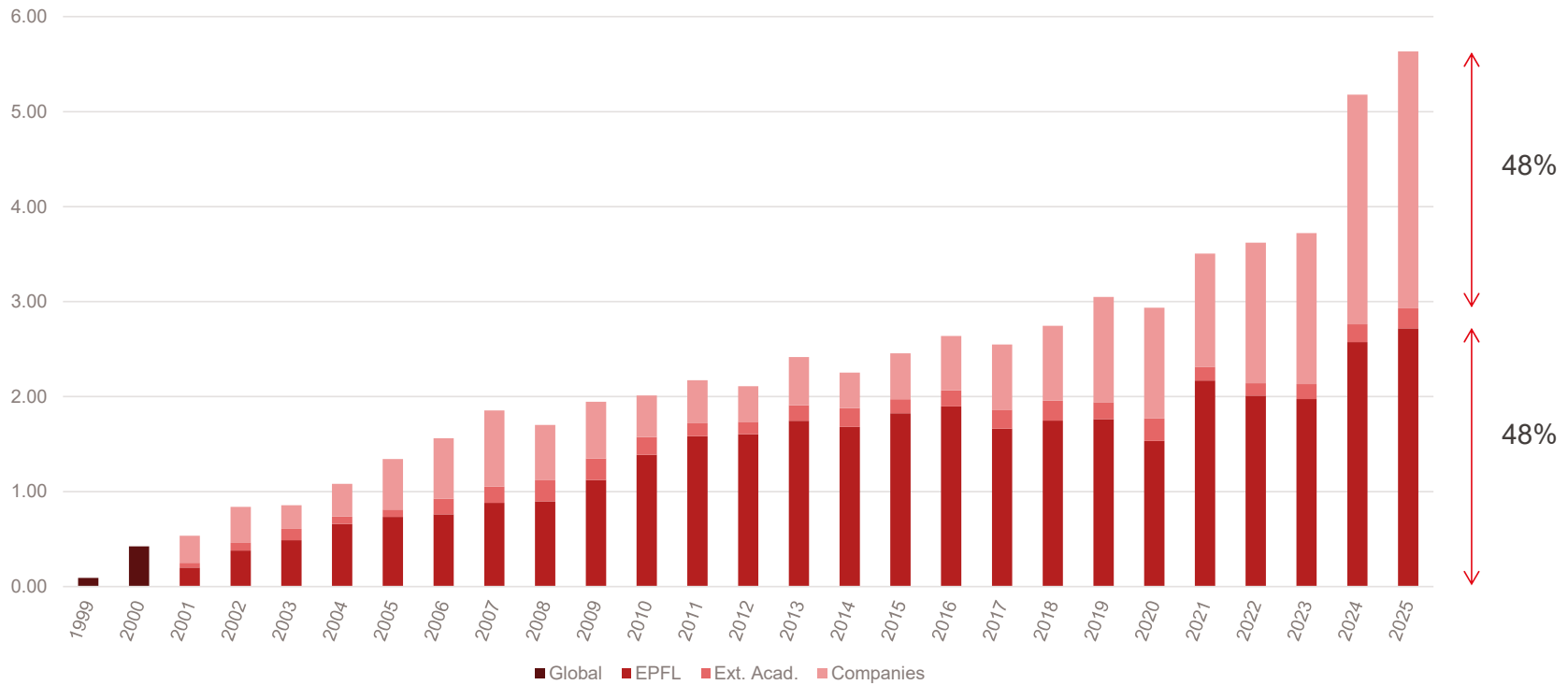


- 61% of the machine hours were billed to EPFL users and 33% to industry

# INVOICING

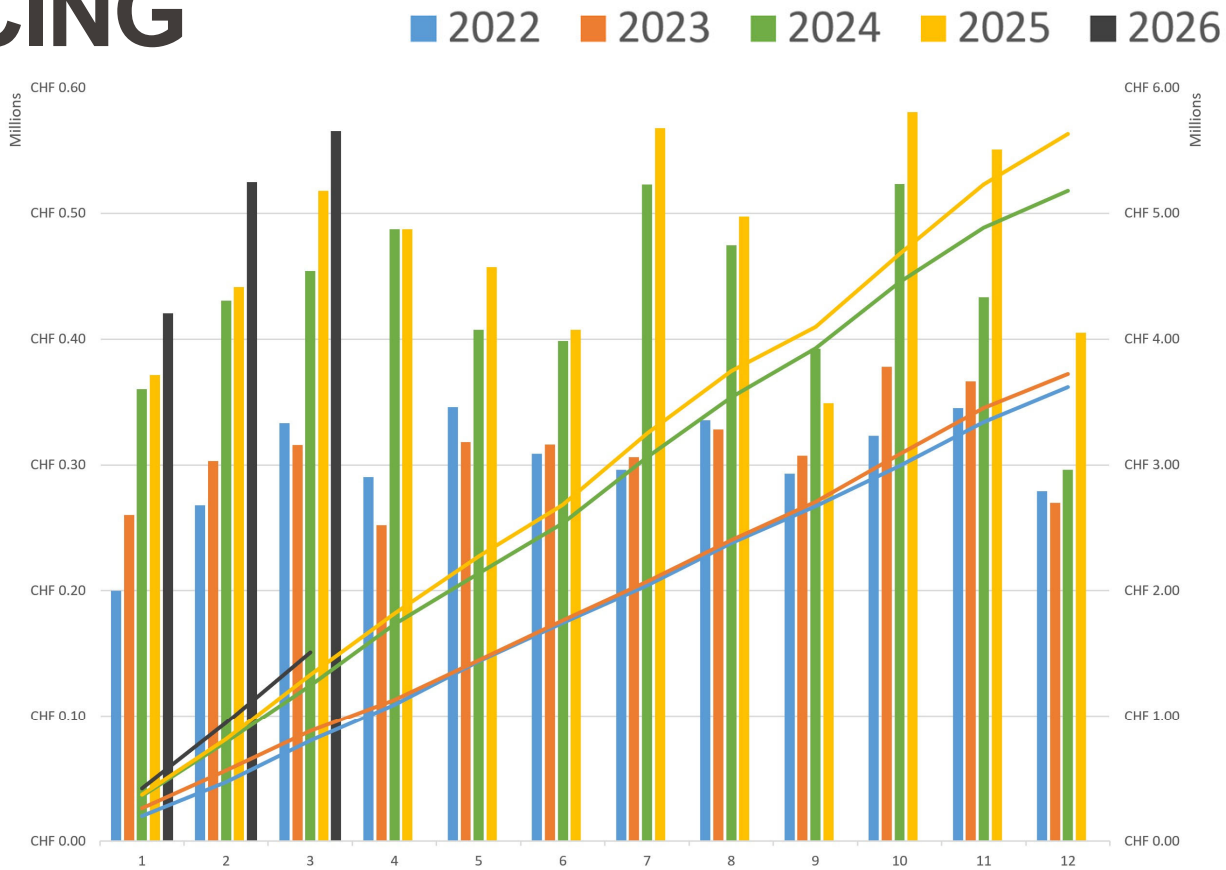
Companies :  
Sales = 48%  
Usage = 33%

EPFL-CMi : Invoiced (MCHF)



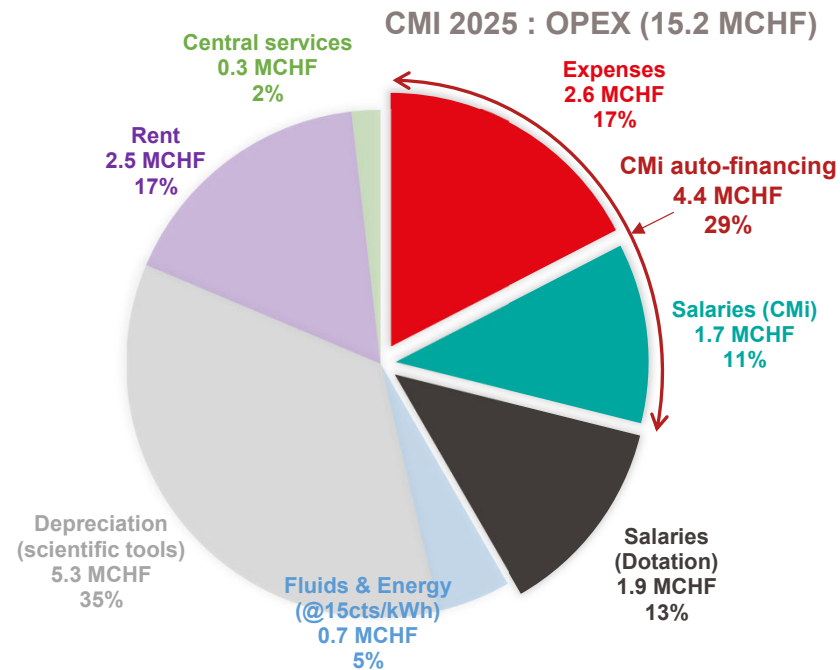
- 5.6 millions CHF were billed to our users in 2025 (+9%)
- 48% were paid by EPFL users and 48% were paid by our industrial users

# INVOICING



- The monthly invoicing to the users shows that 2026 is starting well
- In total, the invoicing to all users for Q1 2026 shows a progression of 14%.

# OPEX 2025



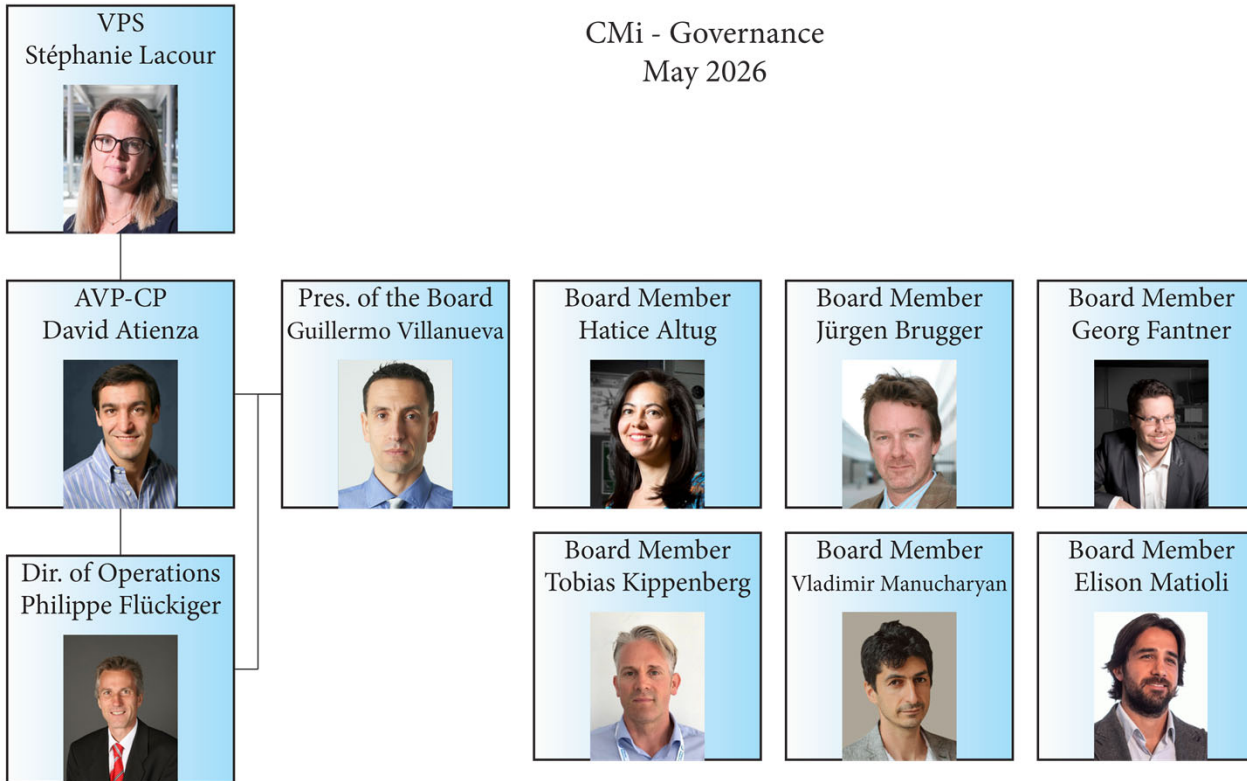
## OPEX

- The invoicing to the users covers 29% of the OPEX
- It covers the direct expenses and 47% of the salaries
- The other 53% of the salaries and the fluids and the energy are paid by the school
- The depreciation is calculated with an amortization in 5 years
- The rent of the building is not paid, but it is calculated according to the CEPF rules.
- Note : The price of the electricity is calculated at an internally agreed rate of 15cts/kWh (which is well below the market price).

- The calculated OPEX in 2025 reaches 15.2 millions CHF
- The invoicing to the users covers 29% of the OPEX

# GOVERNANCE

CMi - Governance  
May 2026



## Governance

- The CMi reports to our Associate Vice President for Centers and Platforms and Vice President for Support to Strategic Initiatives.
- Our executive board is composed of 7 Professors including our president
- Members nominated for a period of 4 years from  
01.11.2018 until 31.10.2022  
01.11.2022 until 31.10.2026

- CMi reports to Associate VP for Centers and Platforms and VP for Support to Strategic Initiatives
- President of our board : Prof. G. Villanueva

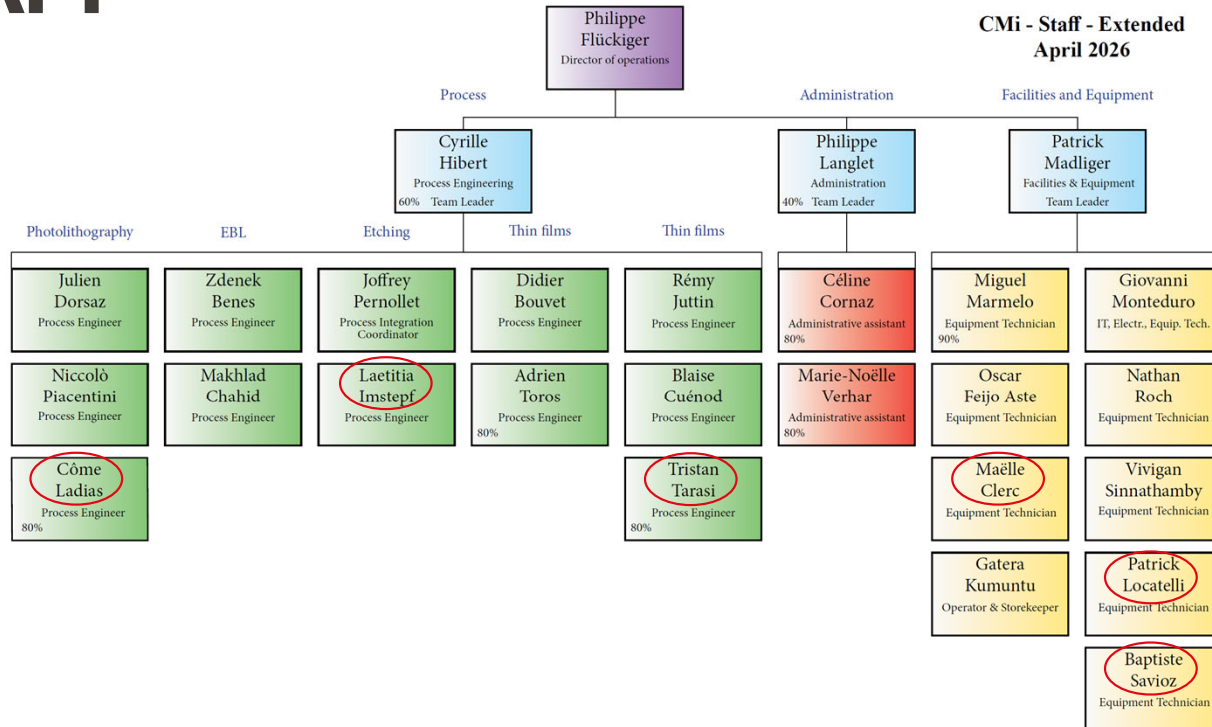
# GOVERNANCE



## Governance

- The CMi reports to our Associate Vice President for Centers and Platforms
  - Our executive board is composed of 9 Professors including our president
  - Members nominated for a period of 4 years from 01.11.2018 until 31.10.2022  
01.11.2022 until 31.10.2026
- I would like to extend my special thanks to the President of the Board who invests a great deal of effort and talent in building a promising future for the CMi.

# STAFF



## Staff

- 27 Staff members
- 24.7 FTE employees
- 6 new colleagues were recently hired
- 22 student ass. are employed part time
- Student assistants represent 2-3 FTE

- Our staff is specialized in Process / Administration / Facilities and Equipment
- Our staff has very few members

# STAFF



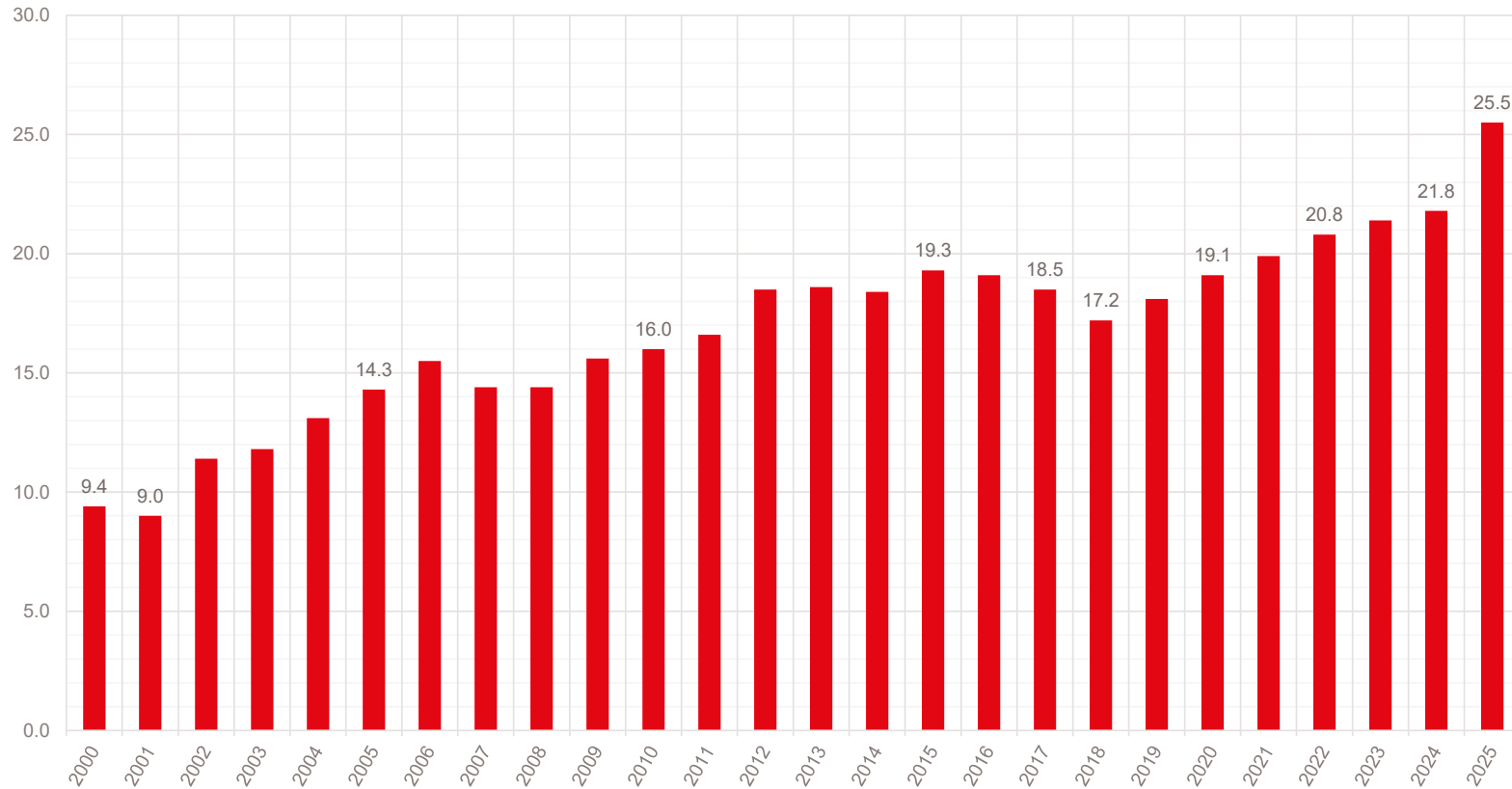
## Staff

- 27 Staff members
- 24.7 FTE employees
- 6 new colleagues were recently hired
- 22 student ass. are employed part time
- Student assistants represent 2-3 FTE

- The 23 student assistants play an important role in the daily operations
- They provide services and they perform training for the new users

# STAFF

EPFL-CMi : Average FTE



- Evolution of the number of FTE since the creation of the CMi.
- The number of FTE is increasing much slower than the users' activity and the number of equipment.

# EQUIPMENT RENEWAL / ACQUISITION



→ JST



→ S.P.M S.r.l.



→ S.P.M S.r.l.

2024 : Lift-Off  
2025 : Piranha et Solvant  
2026 : Métal et Oxides et nettoyage RCA  
2026 : 8 fours LPCVD et atmosphériques



Call for tender soon



Call for tender soon



Call for tender soon



→ Centrotherm

- Renewal of 6 wet benches (1998 vintage)
- Renewal of 8 furnaces (1998 vintage)

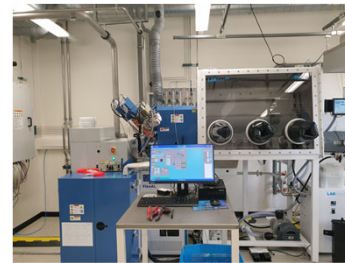
# EQUIPMENT RENEWAL / ACQUISITION



AFM



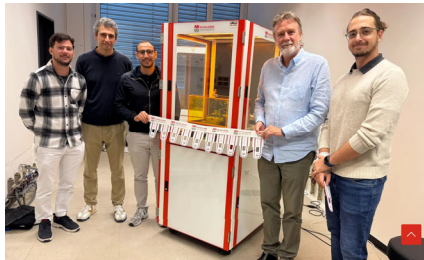
Assembly tool



ALD  
NbN & TiN



Wet bench  
Lift-Off



Thermal Scanning Probe  
Lithography (t-SPL)



Sputter  
NbN, NbTiN, TiN and TaN



ALD  
VO<sub>2</sub>  
Al<sub>2</sub>O<sub>3</sub>, HfO<sub>2</sub>, ZrO<sub>2</sub>, TiN, SiO<sub>2</sub>



HVCVD BaTiO<sub>3</sub> on 200mm

- New tools ordered or already installed

# EQUIPMENT RENEWAL / ACQUISITION

Coming soon ...

Call for tender in preparation :

200mm wafers Sputtering tool

5 targets

SNSPD

(Superconducting Nanowire Single-Photon Detectors)

Collaboration with UNIGE (Prof. Korzh)

Atomic layer etching (ALE)

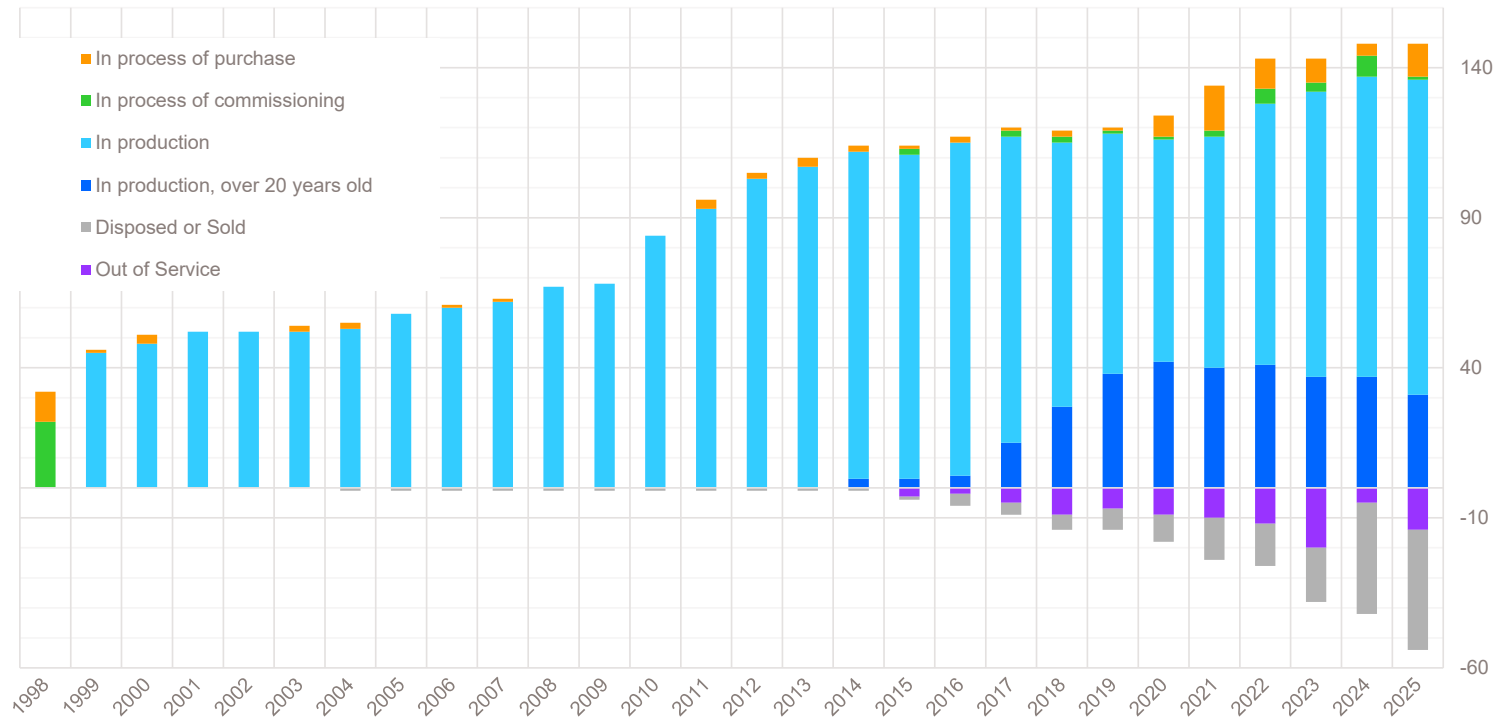
Collaboration with LPQM

(Prof. Kippenberg)

- In discussion ...

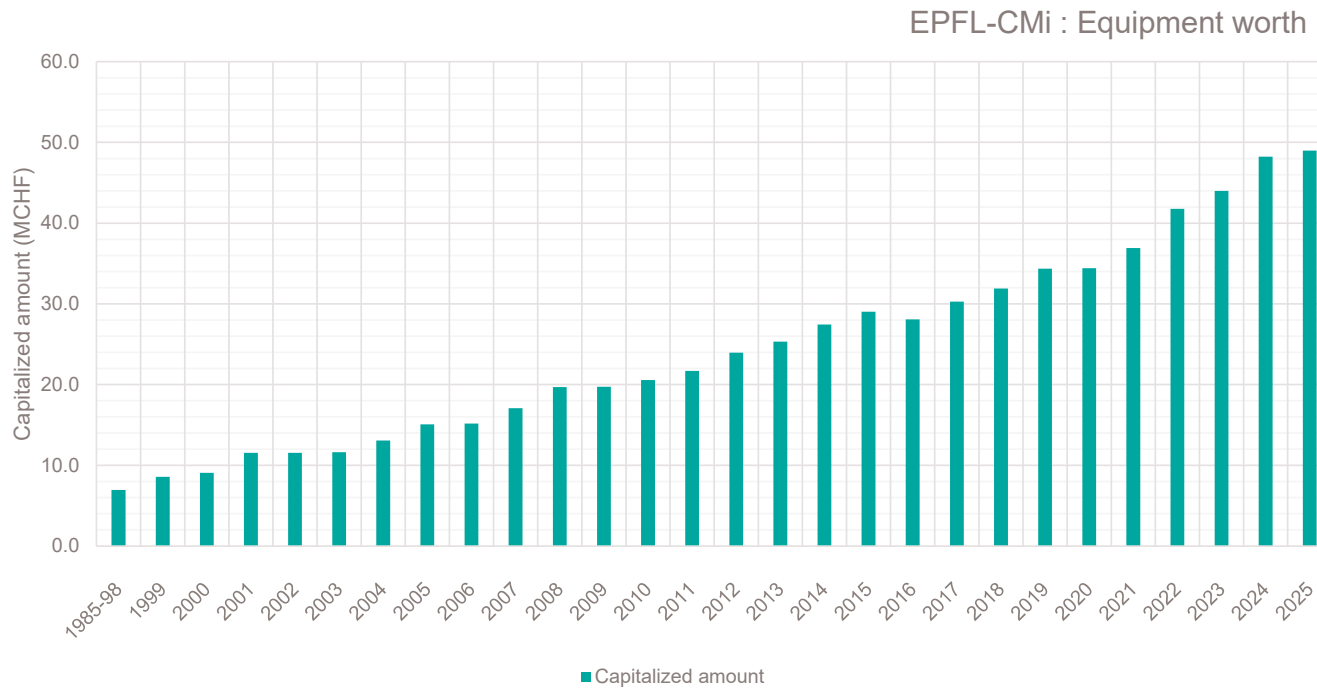
# EQUIPMENT

EPFL-CMi : Number of machines



- 136 machines in production (31/12/2025)
- 12 machines in process of purchase (31/12/2025)

# EQUIPMENT



- The value of the equipment reaches 49 MCHF (purchase price)
- 27.8 MCHF granted by ECO over 6 years (2020-2025)

# Cleanroom extension in 2025



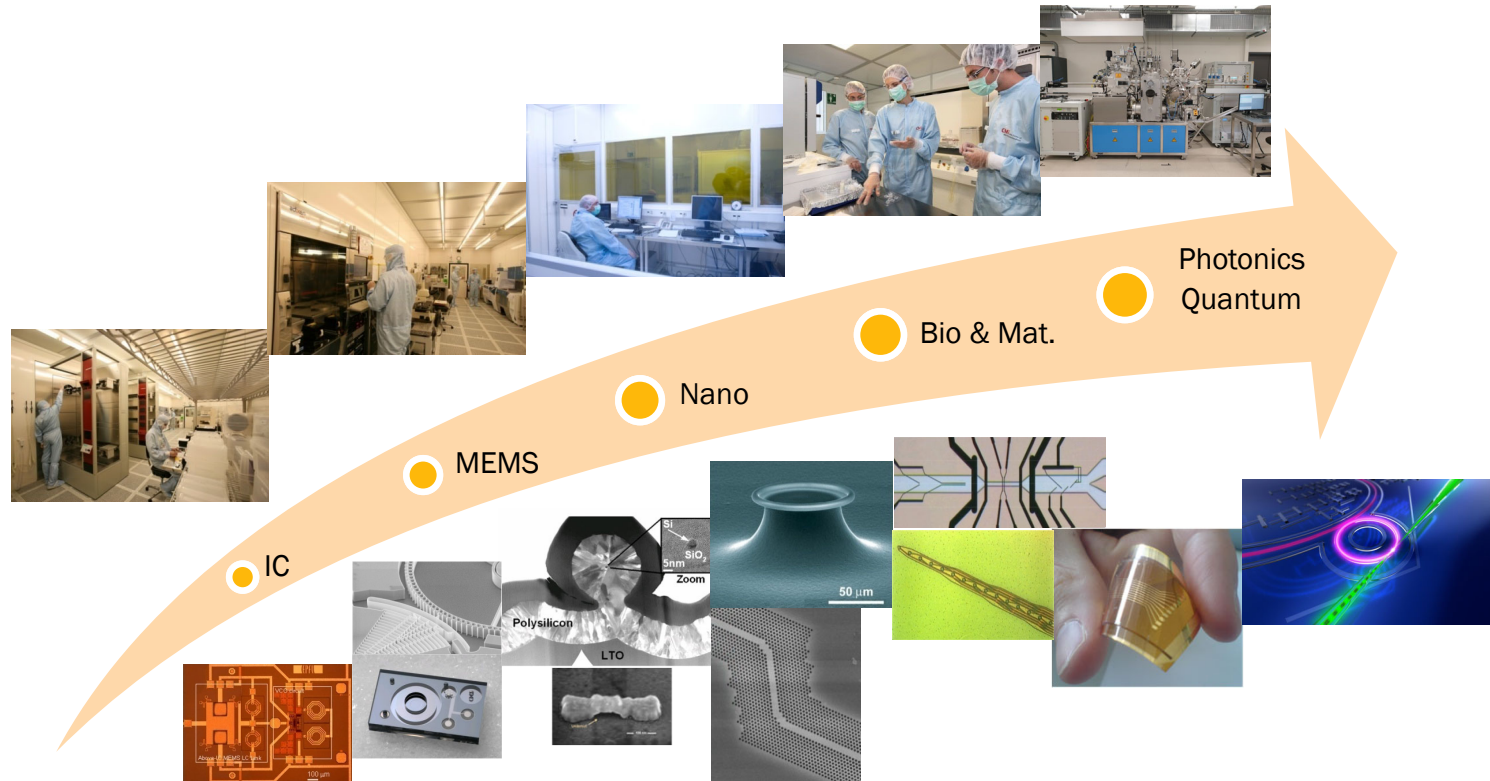
- BM0 at Delivery – October 2025
- 4.5MCHF

# BM0 Z21 – Plassys



- 3 PVD tools for the deposition of superconducting materials
- Fabrication of Josephson Junctions

# HISTORICAL MILESTONES



- Broadening the CMI offer and the CMI users base along the time

# HISTORICAL MILESTONES

Microelectronics & MEMS 1998	<ul style="list-style-type: none"> <li>• CMI created in 1998 &amp; Cleanroom opened in March 1999</li> <li>• Basic Microelectronics processes</li> <li>• MEMS processes like <b>Deep silicon etching</b>, <b>SU-8</b></li> </ul>
Nano / Electron Beam Lithography 2005	<ul style="list-style-type: none"> <li>• <b>Electron Beam Lithography</b> ordered in december in 2005</li> <li>• Focused Ion Beam ordered in september 2003</li> <li>• Atomic Layer Deposition in 2011</li> </ul>
Cleanroom extension 24/7 2010	<ul style="list-style-type: none"> <li>• Cleanroom extension opened in 2010 for <b>more flexibility</b> and cheaper access</li> <li>• <b>Operated now in 24/7 mode</b> since 2012</li> <li>• <b>PDMS</b>, <b>SU-8</b>, Chemistry, Metrology, Non-conventional processes</li> </ul>
Photonics / Quantum / Materials Diversity 2013	<ul style="list-style-type: none"> <li>• <b>Ion Beam Etching</b>, PVD, ALD, PLD, Dry Etching</li> <li>• Chemistry</li> <li>• Photolithography: Mask Fabrication, Coater &amp; Developer, Mask Aligner</li> </ul>
DUV Stepper lithography 2019	<ul style="list-style-type: none"> <li>• <b>DUV stepper</b></li> <li>• Renewal of aging tools &amp; Adding new capabilities</li> <li>• Envision the acquisition of a second EBEAM at the horizon of 2022</li> </ul>
Renewal & Broadening 2019	<ul style="list-style-type: none"> <li>• Deep Si etcher - XeF2 etcher - CMP - Post CMP Cleaner - Super Critical Dryer - Metal etcher</li> <li>• <b>PVD Cluster</b> - LPCVD furnaces - PECVD - Flash Lamp Annealing - Direct Writer</li> <li>• <b>Wafer bonding</b> - CVD diamond - Optical Profiler - SEM - Ellipsometer</li> </ul>
Quantum Science & Engineering / Photonics 2022	<ul style="list-style-type: none"> <li>• UHV evaporator (2x) for <b>Josephson Junctions</b> - UHV sputter for <b>Josephson Junctions</b> - ALD for SC</li> <li>• Second electron beam lithography system</li> <li>• <b>Cleanroom extension in 2025</b></li> </ul>
200mm wafer capability 2026	<ul style="list-style-type: none"> <li>• Acquisition of 200mm equipment</li> <li>• Project of cleanroom extension</li> </ul>

- Description of the development steps of the CMi
- Latest project : Add the capability of processing 200mm wafers

# Swiss Chip Alliance (SCA) NATIONAL EFFORT



Swiss Chip Alliance  
Semiconductor and Photonics Research and Innovation Centers

- Network of cleanroom facilities
- Goals:
  - Consolidate infrastructures
  - Give service to academic and industrial community

- Flagship Center
- Application/Technology Center

csem

EPFL  
**CMI** Center of  
MicroNanoTechnology  
EPFL

PSI  
PICO

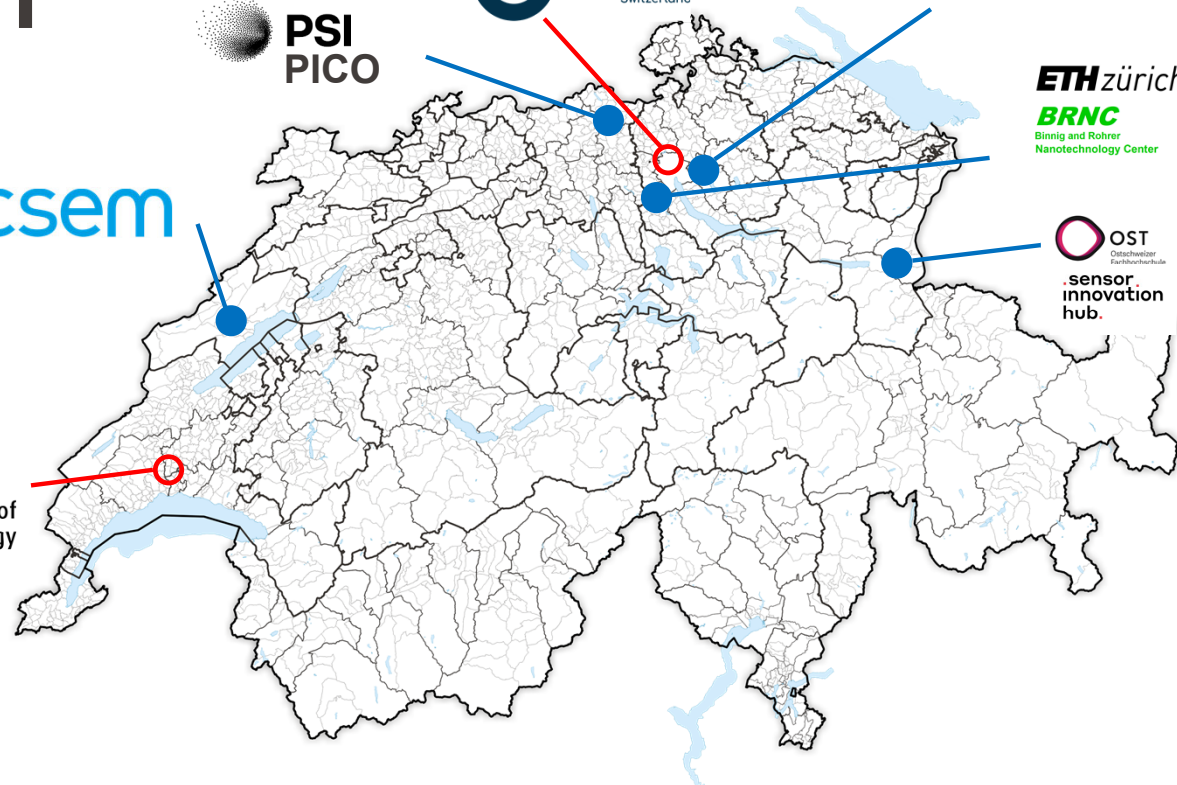
ETH zürich & Industry partners

Empa  
Materials Science and Technology  
Chip FabLab  
Switzerland

ETH zürich  
FIRST  
Center for Micro- and Nanoscience

ETH zürich  
BRNC  
Binnig and Rohrer  
Nanotechnology Center

OST  
Ostschweizer  
Fachhochschule  
sensor  
innovation  
hub.

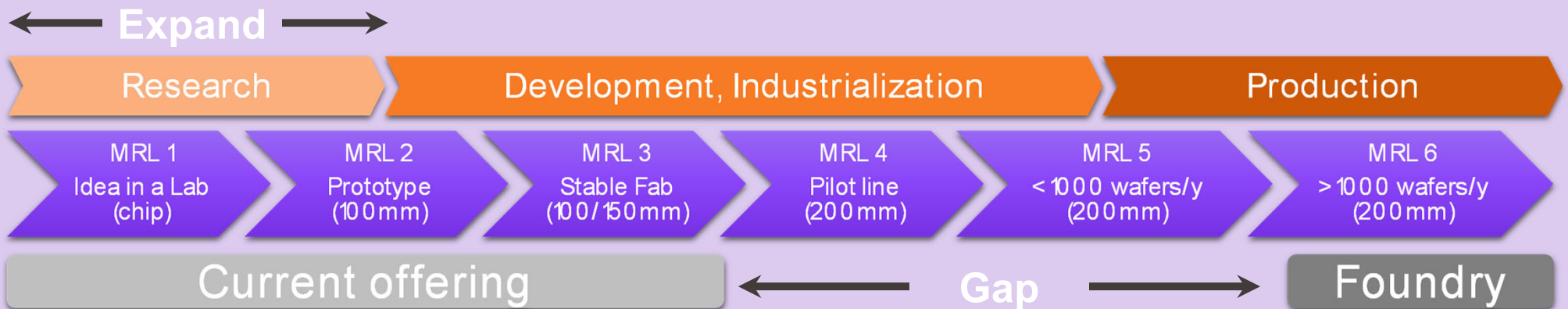


SWISSMEM Hosted by the Swissmem Industry Sector Semiconductors

# From Labs to Market

## From PIONEERING RESEARCH to VALUE CREATION

- Infrastructures must support from low to high MRL (manufacturing readiness level)
- Focus on expanding offer and closing industrialization gap



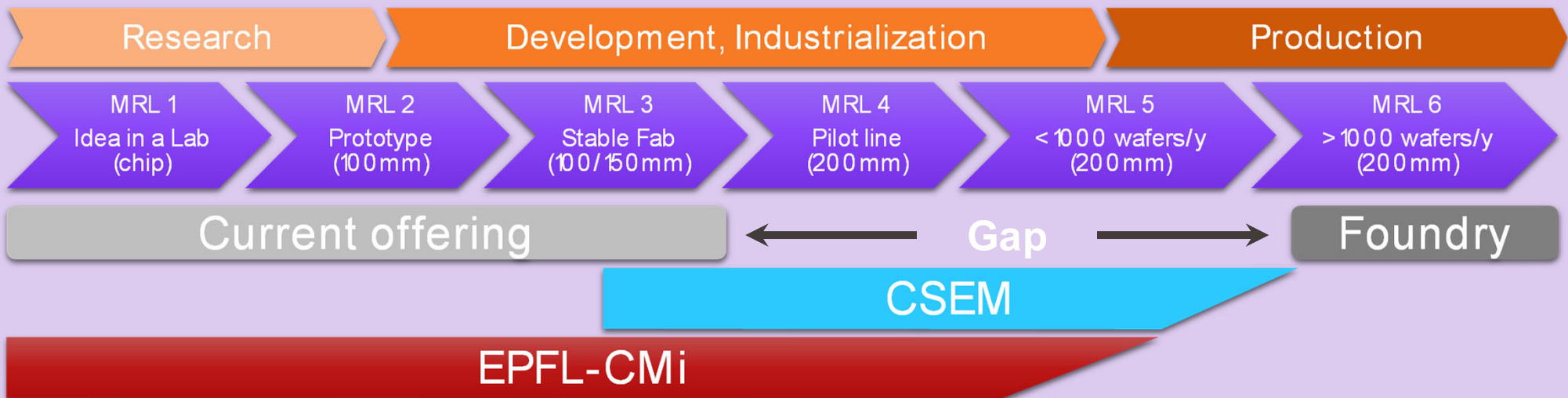
# CMi CSEM Joint Venture



EPFL  
**CMi** Center of  
MicroNanoTechnology

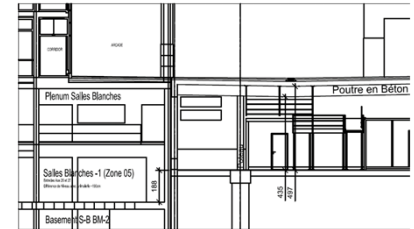
⋮ csem

# Path to industrialization



- Complementary solutions – Different operating models
- Common wafer size platforms (200mm)
- Facilitating transition and sharing of equipment and processes
- Part of the Swiss Chip Alliance

# CLEANROOM



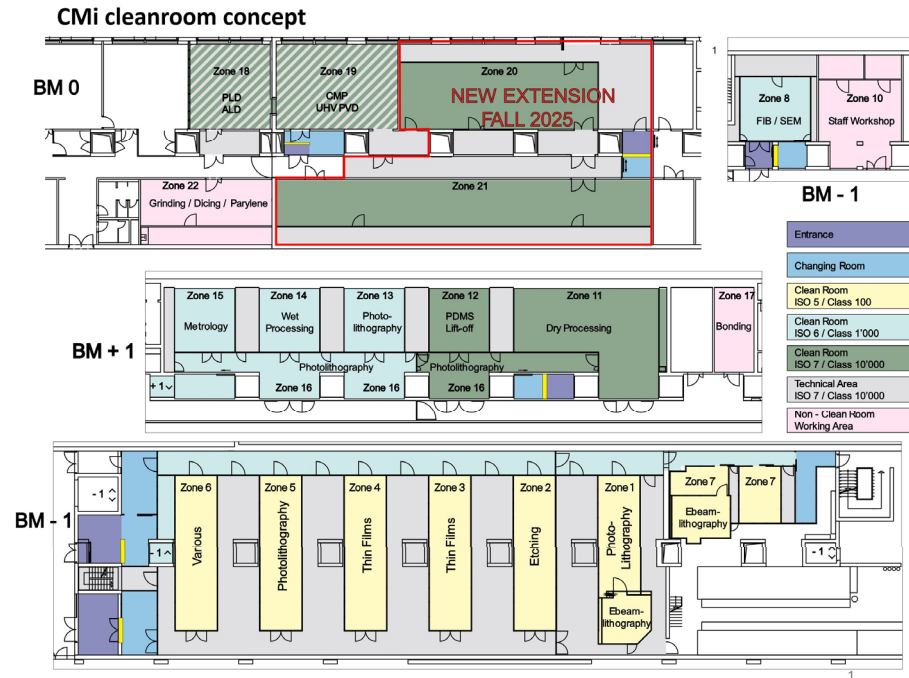
- 389m<sup>2</sup>
- 6x45=270m<sup>2</sup>
- 112m<sup>2</sup>
- 414m<sup>2</sup>

Total : 1185m<sup>2</sup>  
(Total CR : 771m<sup>2</sup>)

$$h(AN) = h(BM-1) + 188\text{mm}$$

- Project of cleanroom extension.
- We are awaiting a decision about a possible available budget.

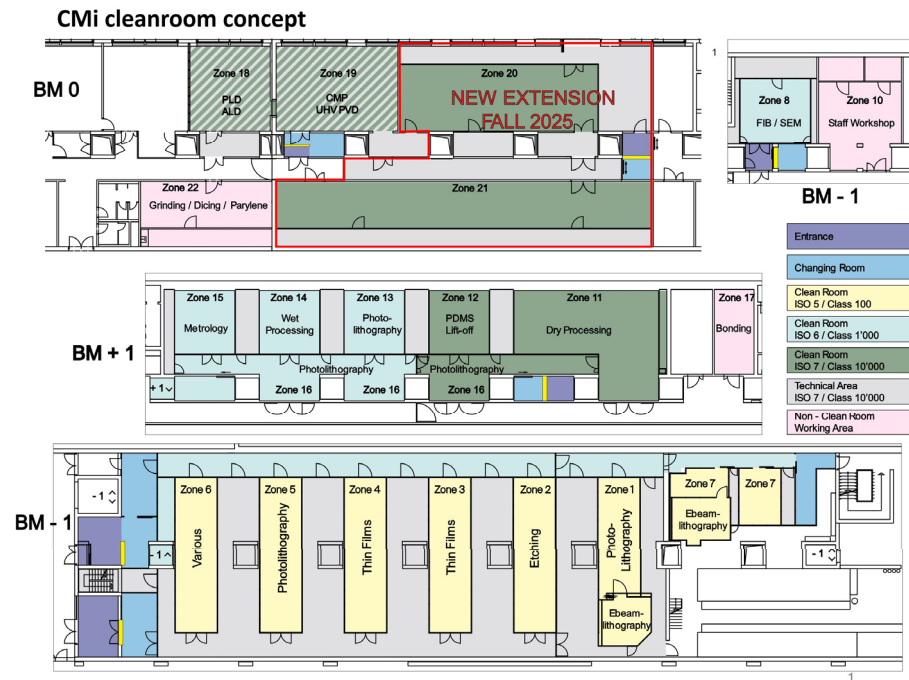
# CLEANROOM



Initial surface BM-1 (1998)	900m <sup>2</sup>
Extension BM+1 (2010)	350m <sup>2</sup>
Extension BM0 (2017)	150m <sup>2</sup>
Extension BM0 (2025)	440m <sup>2</sup>
<b>Total Surface</b>	<b>1840m<sup>2</sup></b>

- Space is a concern
- The opening of the extension at the BM0 in fall 2025 will help on the shorter term

# CLEANROOM

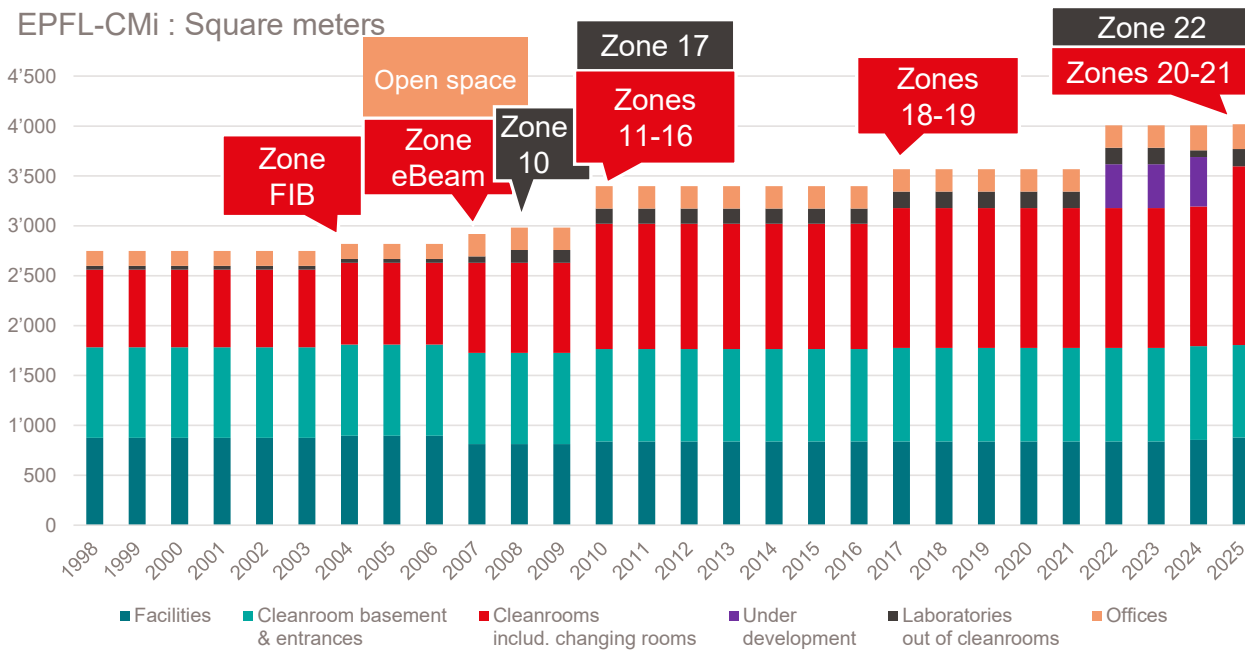


Initial surface BM-1 (1998)	900m <sup>2</sup>
Extension BM+1 (2010)	350m <sup>2</sup>
Extension BM0 (2017)	150m <sup>2</sup>
Extension BM0 (2025)	440m <sup>2</sup>
Project AN (TBC)	771m <sup>2</sup>
<b>Total Surface</b>	<b>2611m<sup>2</sup></b>

- Space is a concern
- The opening of the extension at the BM0 in fall 2025 will help on the shorter term

# SURFACES

4'020 m<sup>2</sup>



- 1'790 m<sup>2</sup> of cleanrooms + 170 m<sup>2</sup> of standard laboratories
- 1'810 m<sup>2</sup> of facilities, basement & entrances + 250 m<sup>2</sup> of offices

# CAPITAL INVESTMENT

- Processing Equipment

Scientific Equipment Levels -1 / 0 / +1	50 MCHF
<b>Total</b>	<b>50 MCHF</b>



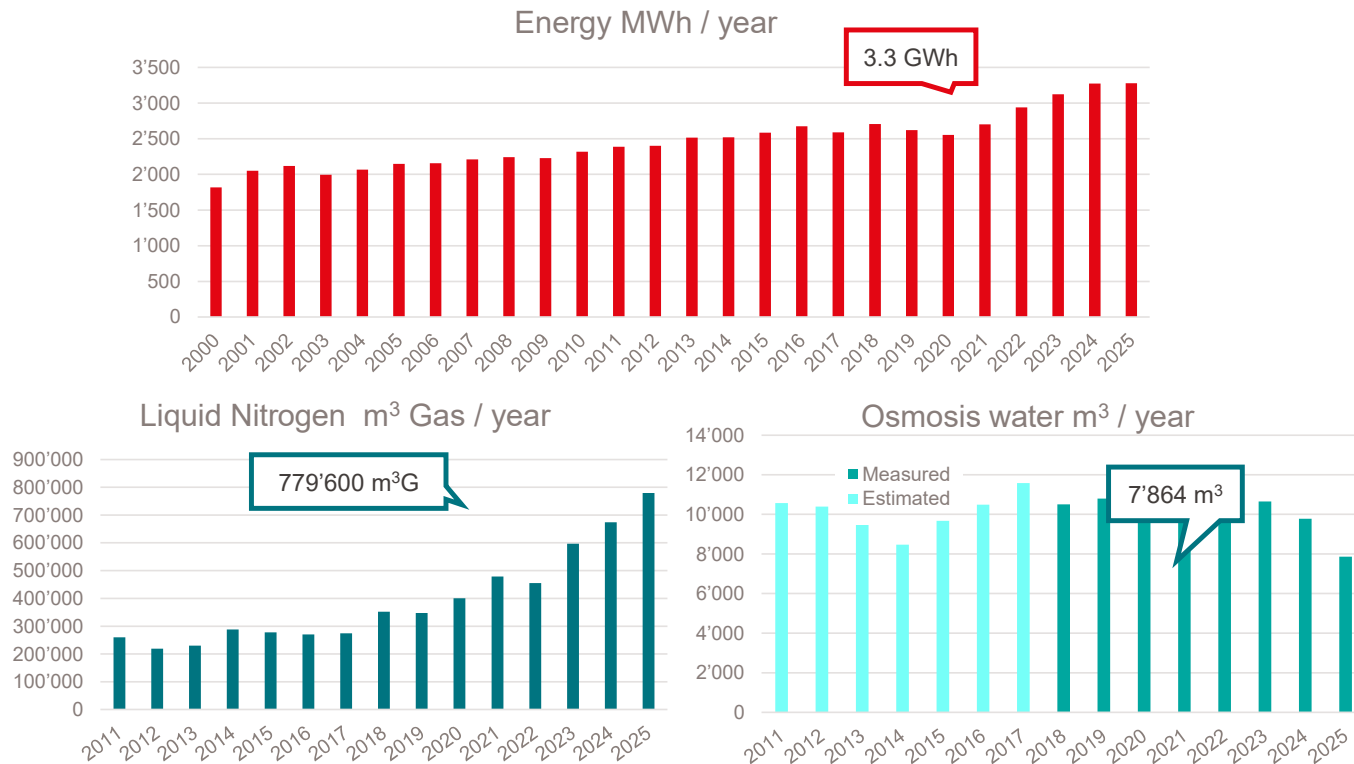
- Cleanroom Infrastructures

Cleanroom Infrastructures Level -1	12 MCHF
Cleanroom Infrastructures Level +1	7 MCHF
Cleanroom Infrastructures Level 0 (1)	2 MCHF (2017)
Cleanroom Infrastructures Level 0 (2)	4 MCHF (2025)
<b>Total</b>	<b>25 MCHF</b>



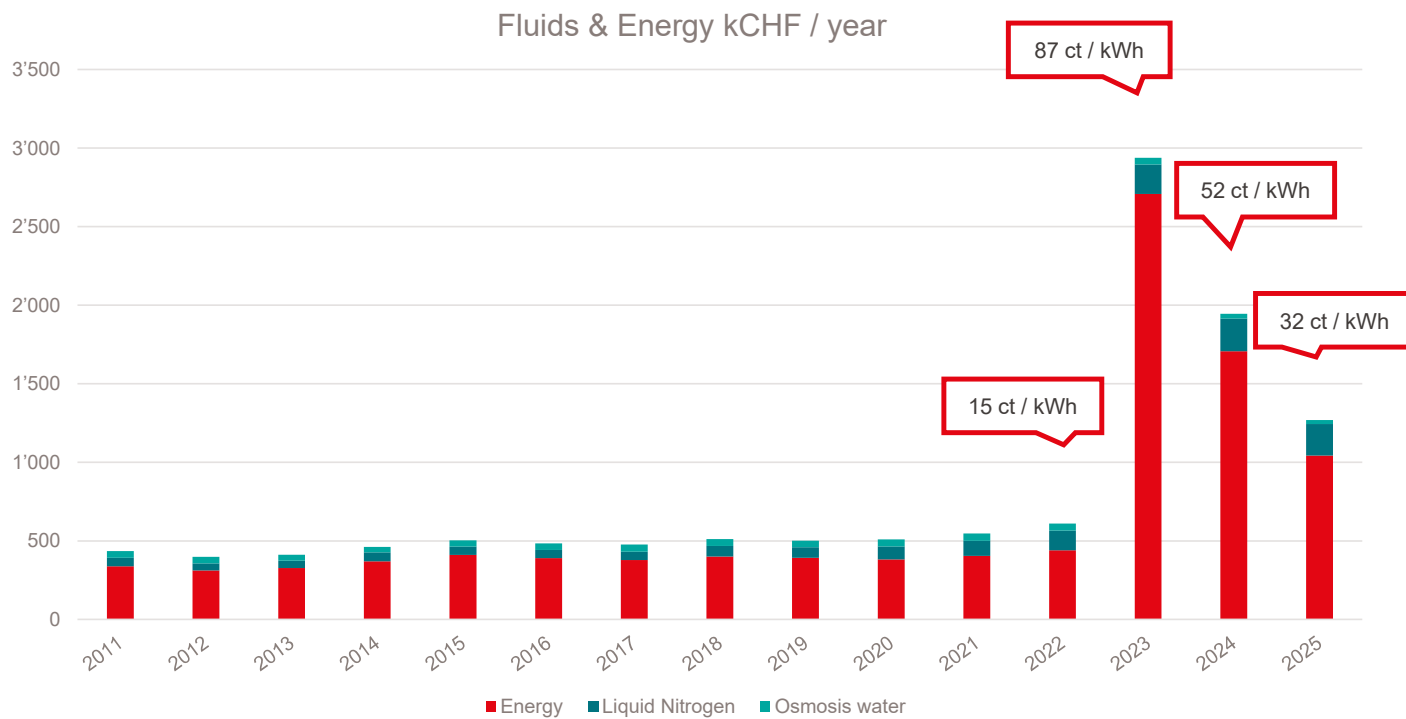
- Total 75MCHF

# ENERGY & FLUIDS



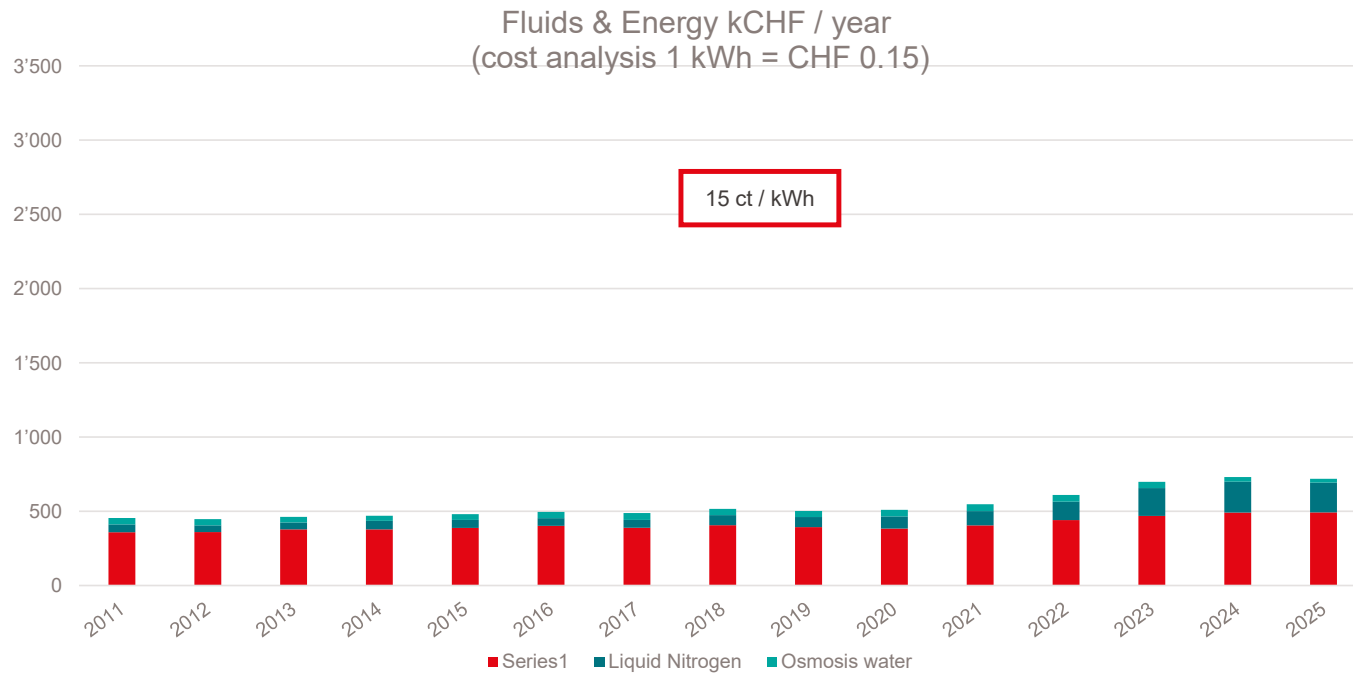
- Since the creation of the CMi we monitor carefully to our consumption
- Electricity / Liquid Nitrogen / Water

# ENERGY & FLUIDS



- Our costs depend very much from the cost of electricity

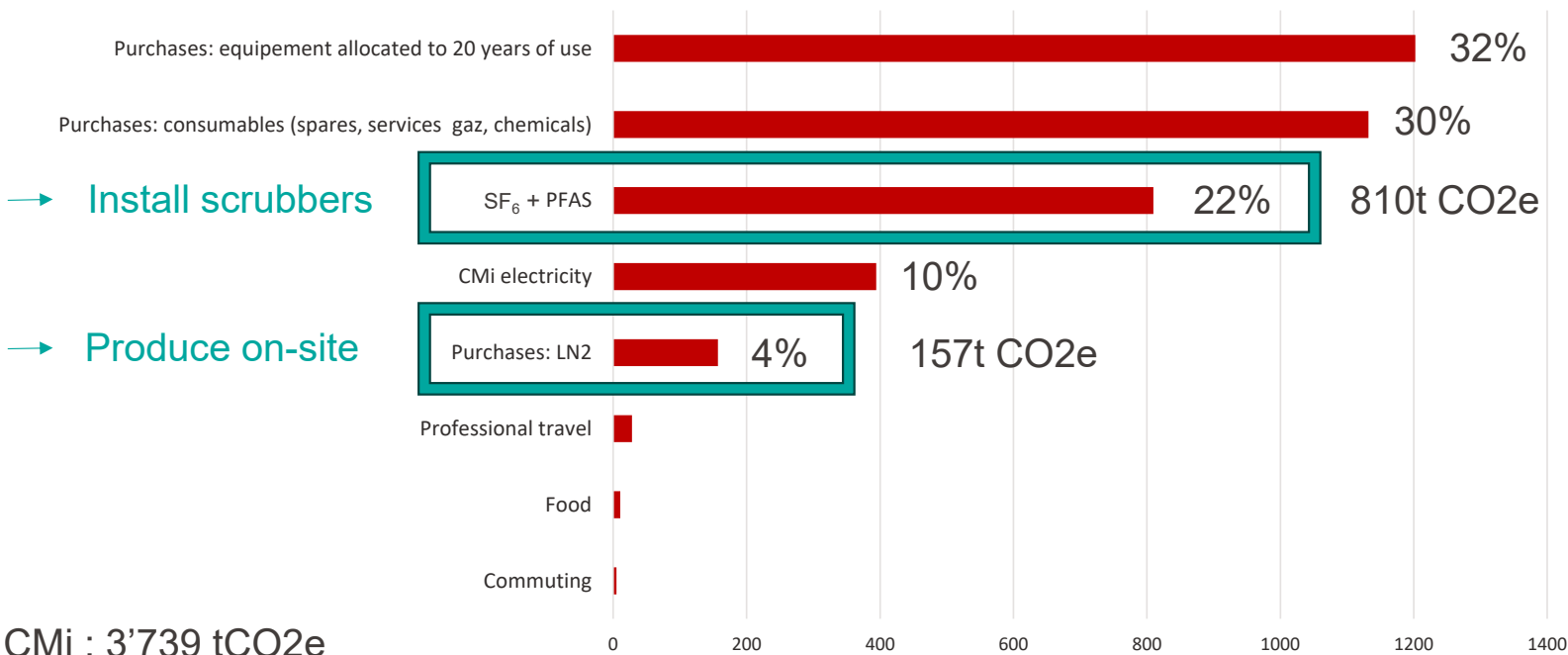
# ENERGY & FLUIDS



- For cost analysis we maintained artificially a calculation cost of CHF0.15 per kWh

# SUSTAINABILITY

Carbon footprint CMi in t CO2e for 2024



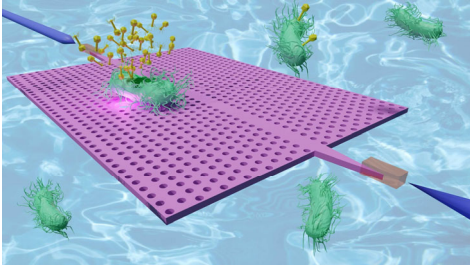
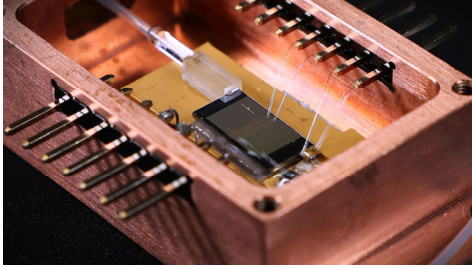
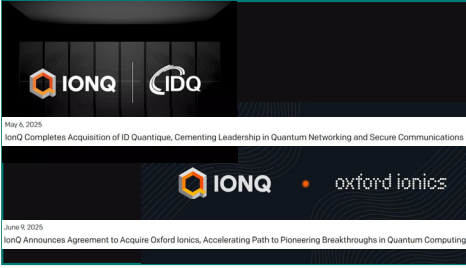
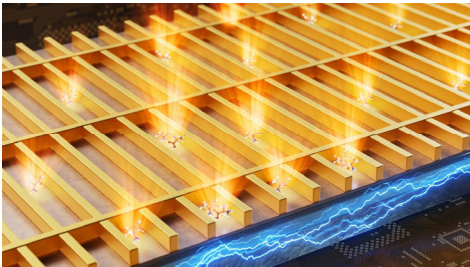
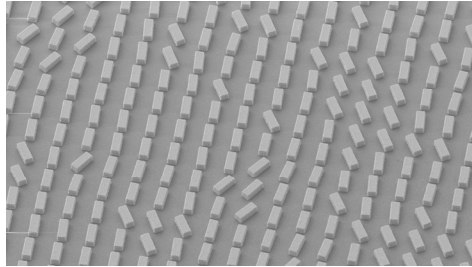
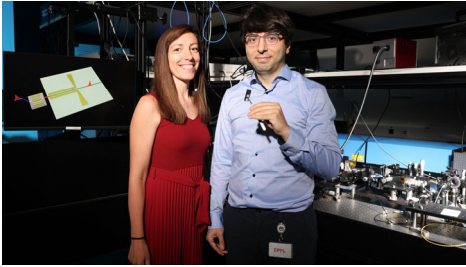
Gas	GWP [CO <sub>2</sub> eq]	Lifetime [years]
CF <sub>4</sub>	7390	5000
CHF <sub>3</sub>	11700	264
CH <sub>2</sub> F <sub>2</sub>	650	5,6
C <sub>2</sub> F <sub>6</sub>	12200	10000
C <sub>3</sub> F <sub>8</sub>	7000	2600
c-C <sub>4</sub> F <sub>8</sub>	8700	3200
SF <sub>6</sub>	22800	3200
NF <sub>3</sub>	17200	740
C <sub>4</sub> F <sub>6</sub>	~0	~0
c-C <sub>5</sub> F <sub>8</sub>	90	~1
F <sub>2</sub> (FAN)	~0	~0

GWP = Global Warming Potential  
(values normalized for 100 year lifetime)

CMi : 3'739 tCO2e  
EPFL : 85'562 tCO2e


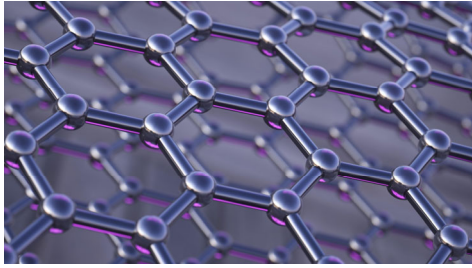

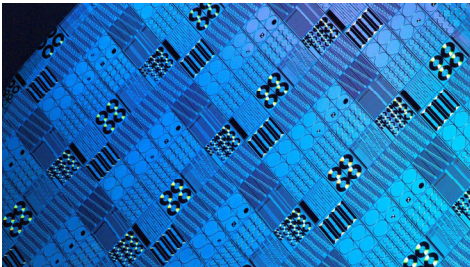
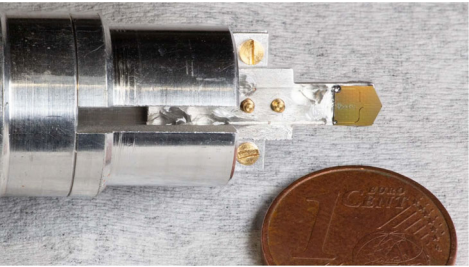

- Carbon footprint of CMi in 2024
- SF6 & PFAS contribution : > 90% reduction achievable using waste gas abatement

# CMi inside

<p>Houdré (PHOTONIC CRYSTAL CAVITIES) Advanced Optical Materials <a href="https://doi.org/10.1002/adom.202402586">https://doi.org/10.1002/adom.202402586</a> January 2025</p>	<p>Kippenberg (PHOTONIC INTEGRATED CIRCUITS) Nature Photonics <a href="https://doi.org/10.1038/s41566-025-01687-0">https://doi.org/10.1038/s41566-025-01687-0</a> June 2025</p>	<p>ID Quantique acquired by IonQ in May 2025 Oxford Ionics acquired by IonQ in June 2025 Both companies active in CMi</p>
		
<p>ALTUG (OPTICAL BIOSENSOR) Nature Photonics <a href="https://doi.org/10.1038/s41566-025-01708-y">https://doi.org/10.1038/s41566-025-01708-y</a> June 2025</p>	<p>ALTUG (OPTICAL METASURFACES) Nature Communications <a href="https://doi.org/10.1038/s41467-025-61221-2">https://doi.org/10.1038/s41467-025-61221-2</a> July 2025</p>	<p>BENEA (PHOTONIC CIRCUITS) Nature Communications <a href="https://doi.org/10.1038/s41467-025-62267-y">https://doi.org/10.1038/s41467-025-62267-y</a> July 2025</p>
		



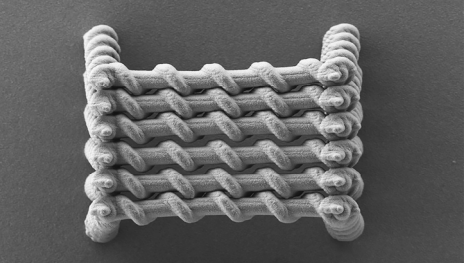
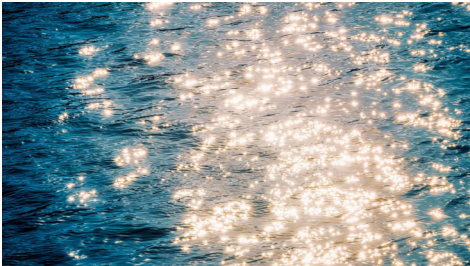
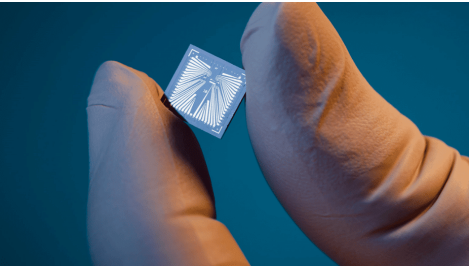
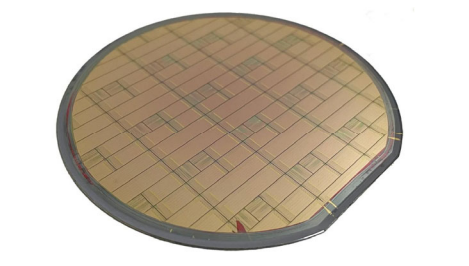
- A selection of publications which attracted special interest (last 12 months)
- Publications in high impact journals were relayed onto the EPFL home page

# CMi inside

<p>Corintis (CHIP COOLING FOR IA) One of Switzerland's leading startups Raised over CHF 27 million in funding August 2025</p>	<p>Banerjee (SUPERCONDUCTIVITY) Nature Physics <a href="https://doi.org/10.1038/s41567-025-03040-2">https://doi.org/10.1038/s41567-025-03040-2</a> September 2025</p>	<p>Sakar (Microcatheter) Science Robotics <a href="https://doi.org/10.1126/scirobotics.adu4003">https://doi.org/10.1126/scirobotics.adu4003</a> October 2025</p>
		
<p>Kippenberg (PHOTONIC INTEGRATED CIRCUITS) Nature <a href="https://doi.org/10.1038/s41586-025-09598-4">https://doi.org/10.1038/s41586-025-09598-4</a> October 2025</p>	<p>Kippenberg (PHOTONIC INTEGRATED CIRCUITS) Nature Communications <a href="https://doi.org/10.1038/s41467-025-62808-5">https://doi.org/10.1038/s41467-025-62808-5</a> September 2025</p>	<p>Sorin (ELECTRONIC FIBERS) Nature Electronics <a href="https://doi.org/10.1038/s41928-025-01485-0">https://doi.org/10.1038/s41928-025-01485-0</a> October 2025</p>
		

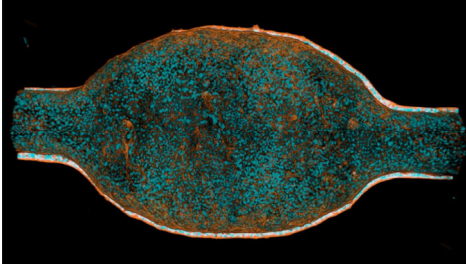
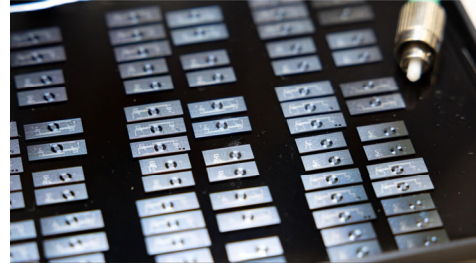
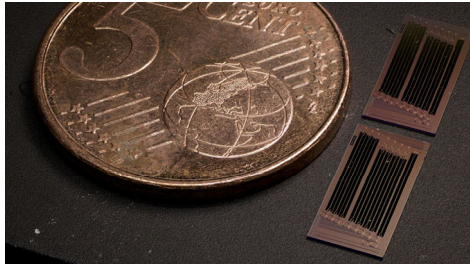
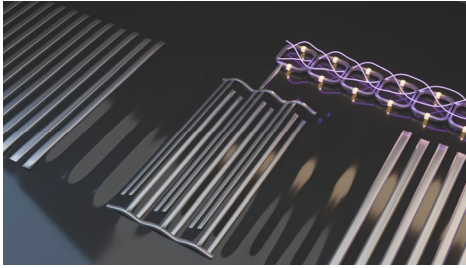
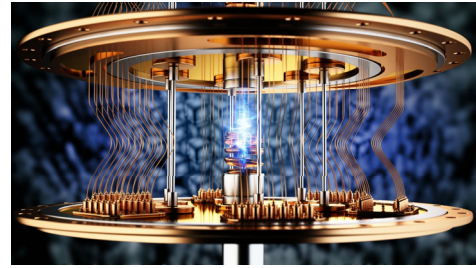
- A selection of publications which attracted special interest (last 12 months)
- Publications in high impact journals were relayed onto the EPFL home page

# CMi inside

<p>Altug and Scarlino (Quantum Science and Engineering) SNSF Swiss-Korean quantum grants 2x 800kCHF November 2025</p>	<p>Kippenberg (QUANTUM OPTOMECHANICS) Marcel Benoist Swiss Science Prize <a href="https://marcel-benoist.ch/fr/remise-du-prix-2025/">https://marcel-benoist.ch/fr/remise-du-prix-2025/</a> November 2025</p>	<p>Grundler (MAGNOGNICS) Nature Nanotechnology <a href="https://doi.org/10.1038/s41565-025-02055-3">https://doi.org/10.1038/s41565-025-02055-3</a> December 2025</p>
		
<p>Tagliabue (HYDROVOLTAIC) Nature Communications <a href="https://doi.org/10.1038/s41467-025-68261-8">https://doi.org/10.1038/s41467-025-68261-8</a> January 2026</p>	<p>Xsensio (WEARABLE BIOSENSING) Draws €6 million March 2026</p>	<p>Kippenberg (ELECTRO-OPTICAL PHOTONIC INTEGRATED CIRCUITS) Nature Communications <a href="https://doi.org/10.1038/s41467-026-69588-6">https://doi.org/10.1038/s41467-026-69588-6</a> February 2026</p>
		

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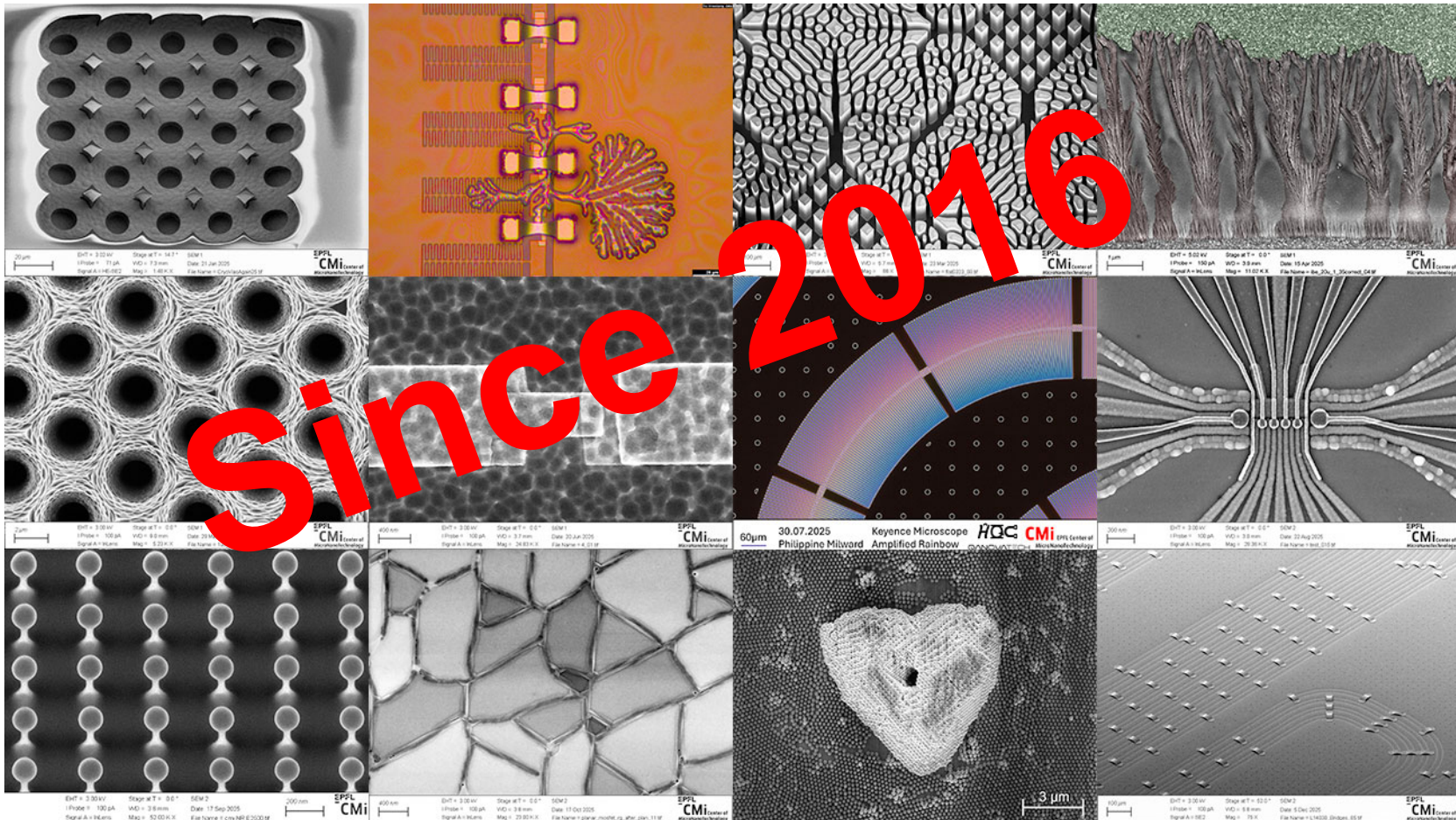
# CMi inside

<p>McKinney &amp; Lütolf (ORGANOIDS &amp; BIOTECHNOLOGY) Nature Communications <a href="https://doi.org/10.1038/s41467-026-68573-3">https://doi.org/10.1038/s41467-026-68573-3</a> February 2026</p>	<p>Kippenberg (PHOTONIC CHIPS) Nature Communications <a href="https://doi.org/10.1038/s41467-026-69787-1">https://doi.org/10.1038/s41467-026-69787-1</a> March 2026</p>	<p>Kippenberg (PHOTONIC CHIPS) Nature Communications <a href="https://doi.org/10.1038/s41467-026-69769-3">https://doi.org/10.1038/s41467-026-69769-3</a> February 2026</p>
		
<p>Scarlino (QUANTUM TECHNOLOGIES) PRX Quantum <a href="https://doi.org/10.1103/rk3m-dnwp">https://doi.org/10.1103/rk3m-dnwp</a> March 2026</p>	<p>Scarlino (QUANTUM SENSING) Science Advances <a href="https://doi.org/10.1126/sciadv.aeb9784">https://doi.org/10.1126/sciadv.aeb9784</a> April 2026</p>	
		

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- Publications in high impact journals were relayed onto the EPFL home page

# PICTURE CONTEST 2025

For the pleasure of the eyes : the official winners of the monthly picture contest



EPFL

# PROGRAM



CMI - EPFL Center of MicroNanoTechnology

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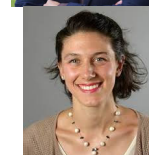
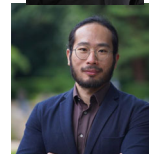
## List of posters

- The 192 posters presented today are available online
- Password is available on request
- A few paper brochures are available

<https://cmiaccess.epfl.ch/projects/>



# PROGRAM



## Program

Explore a day of insightful talks and connect with top exhibitors throughout the event.

08:00 - 18:00	Coffee and Croissants & Registration & Exhibit Inspection
08:00 - 18:00	Introduction Philippe Hunzler <a href="#">Center of MicroNanoTechnology (CMI) - EPFL</a>
08:00 - 18:00	Full-stack innovation to accelerate lab-to-fab Ji De Bruijn <a href="#">Executive Vice President &amp; Chief Strategy Officer   IMEC</a>
08:00 - 18:00	Shared nanofab platforms as innovation engines: co-design approaches enabling rapid transfer across academia, RTOs, and industry Thomas Ernst <a href="#">Vice President Science and Technology &amp; Scientific Director   LETI</a>
08:00 - 18:00	Hardware for sustainable AI based on 2D semiconductors Andreia Aze <a href="#">Laboratory of Nanoscale Electronics and Structures (LANEG) - EPFL</a>
09:00 - 10:00	Coffee Break & Poster Session & Exhibit Inspection
09:00 - 10:00	Superconducting nanowires: the Qubit Electronics of the Quantum Era Boris Korzh <a href="#">Laboratory of Quantum Technologies - UQAM</a>
09:00 - 10:00	A few surprises in nanoscale plumbing Mikea Koudine <a href="#">The Quantum Plumbing Lab (UQAM) - EPFL</a>
09:00 - 10:00	Shedding Army 'Killer' Crystals for Biomedicine and Neuroimaging: Computing Felix Zhang <a href="#">Laboratory for Bio-Informatics (LBI) - EPFL</a>
09:00 - 10:00	Lunch & Poster Session & Exhibit Inspection
09:00 - 10:00	Nanostructures from crystalline metals Hans Martin <a href="#">Nanophotonics and Metamaterials Laboratory (NML) - EPFL</a>
09:00 - 10:00	Nanostructured Structures for Light Absorption and Emission Einar Torgstade <a href="#">Laboratory of Nanoscale for Energy Technologies (LNET) - EPFL</a>
09:00 - 10:00	Coffee Break & Poster Session & Exhibit Inspection
09:00 - 10:00	New materials and processes to fabricate silicon- and ferroelectric thin films for electronics, photonics and quantum devices Lars Gommershauser <a href="#">Surface Science &amp; Coating Technologies - SATM</a>
09:00 - 10:00	Breaking the Bottleneck: Comb Lasers for the Future of AI and Optical VC John Jost <a href="#">Vice-Chief Business Officer (COO) - Hologra</a>
09:00 - 10:00	The development of MEMS at SAIFRAM Valérie Rastan <a href="#">Senior Vice President and CEO - Surface Tronic Technologies</a>
09:00 - 10:00	Cocktails & Poster Session & Exhibit Inspection
09:00 - 10:00	Exhibitors' parallel talks <a href="#">Program</a>



## Program

- Very exciting program
- 11 presentations
- Spanning an exceptionally broad range
- Try to be different every year
- Not always invite our heavy users
- Emphasize on the new Professors @ EPFL
- Sometimes also some exotic users
- One common point:
- MicroNanoFabrication

# PROGRAM



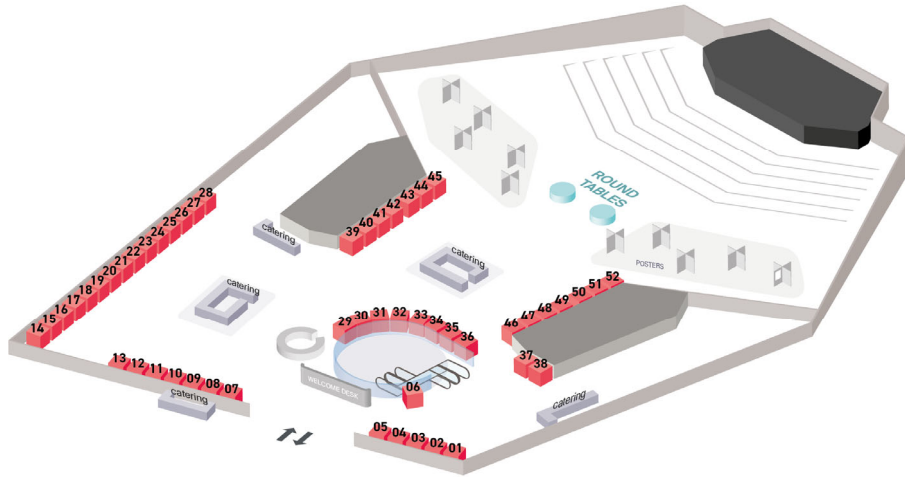
## Exhibitors

- 78 companies
- Thank you to all of them
- 11 exhibitors' talks in parallel sessions

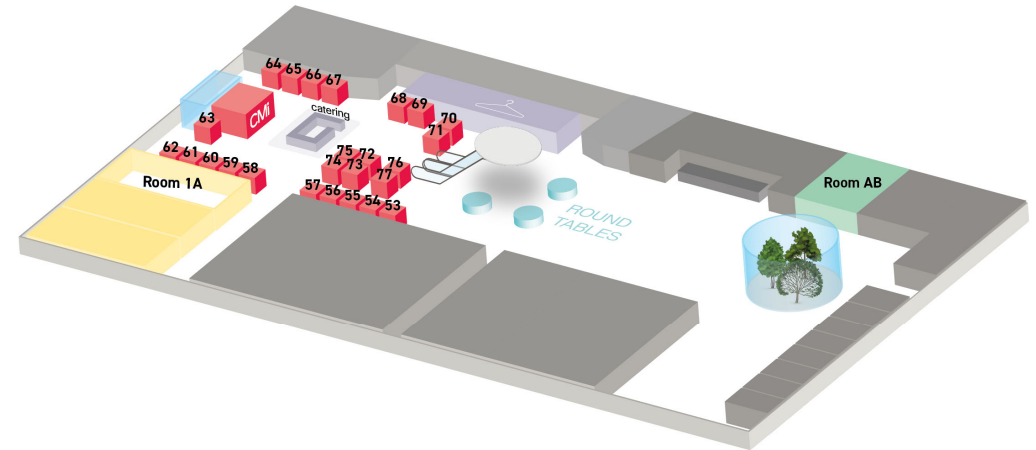
- Thank you to all our exhibitors
- Our exhibitors play an important role in the success of this event

# PROGRAM

L1 - Campus



L0 - Garden



- We are this year on 2 levels for first time
- Roundtables for questions to the speakers

# THANK YOU

■ “Alone we can do so little, together we can do so much.”



**EPFL**

EVENT

**Thank you  
for your  
attention !**

■ École  
polytechnique  
fédérale  
de Lausanne



PRESENTED BY

**Philippe Flückiger**  
Director of Operations

**EPFL**

EVENT

# Enjoy the conference !

■ École  
polytechnique  
fédérale  
de Lausanne



PRESENTED BY

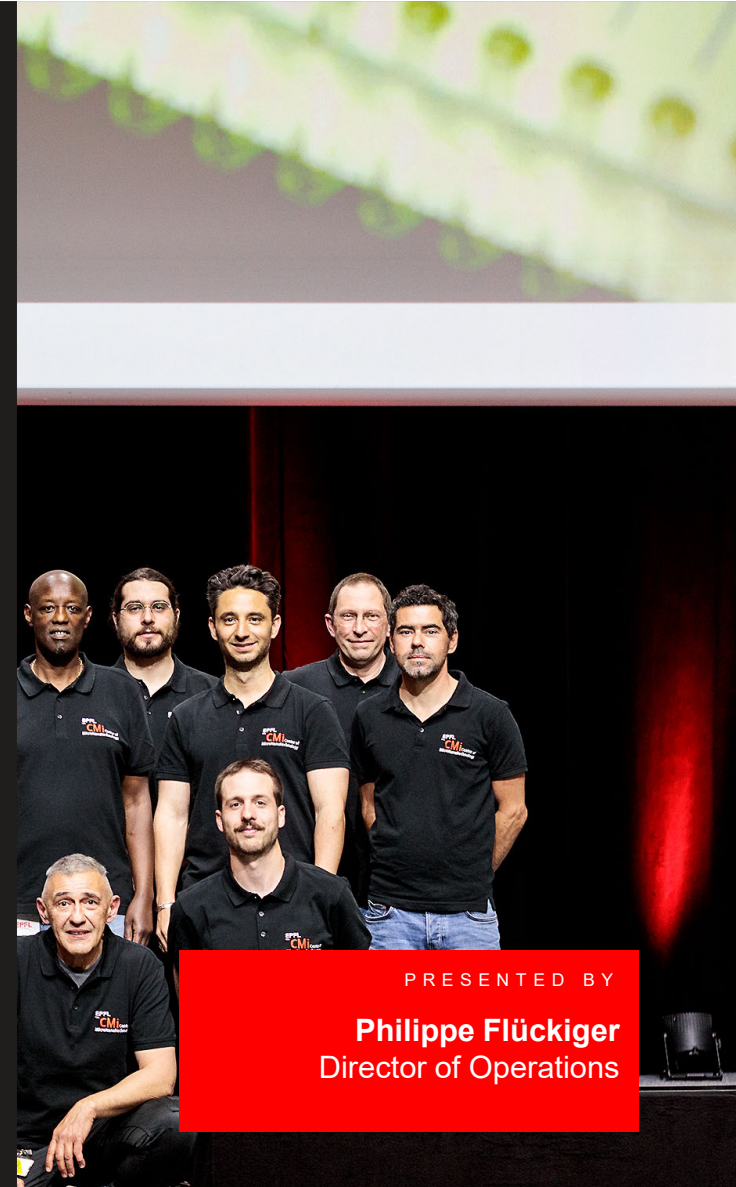
**Philippe Flückiger**  
Director of Operations

**EPFL**

EVENT

**Thank you  
for your  
attention !**

■ École  
polytechnique  
fédérale  
de Lausanne



**EPFL**

EVENT

**Thank you  
for your  
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polytechnique  
fédérale  
de Lausanne



PRESENTED BY

**Philippe Flückiger**  
Director of Operations