



LLR participation in ePIC

Matthew Nguyen
ePIC Collaboration Council
January 26th, 2024



Geographical & Scientific context

Saclay Plateau: the scientific hub of the Paris region



Laboratoire-Leprince Ringuet (LLR) is the experimental HEP lab of the **École Polytechnique**

- ▶ O(100) physicists and engineers
- ▶ Long history of HEP & heavy-ion experiments (CMS, LHCb, PHENIX, NA38/50, etc.)
- ▶ Neighboring theory (CPHT) & microelectronics (OMEGA) labs already involved in EIC / ePIC

IJCLab @ nearby **Paris-Saclay U.** already in ePIC
➔ we are collaborating directly with them

CEA is also in ePIC, although via different funding agency & different detector projects

There is a sizable QCD community in the area spanning HEP-hadronic & experiment-theory

LLR participation

ePIC effort initiated by Matthew Nguyen (research scientist)

Qualifications:

- ▶ PhD @ Stony Brook on PHENIX (2009)
- ▶ Participation in heavy-ion program of CMS (2009 — present)
 - ▶ Heavy-ion project manager (2019 —)
 - ▶ Heavy-ion Physics Analysis Group convener (2014 — 2015)
- ▶ Coordination of CMS offline software (CMSSW):
 - Offline Release Manager (2024 — 2026)
 - Reconstruction convener (2022 — 2024)

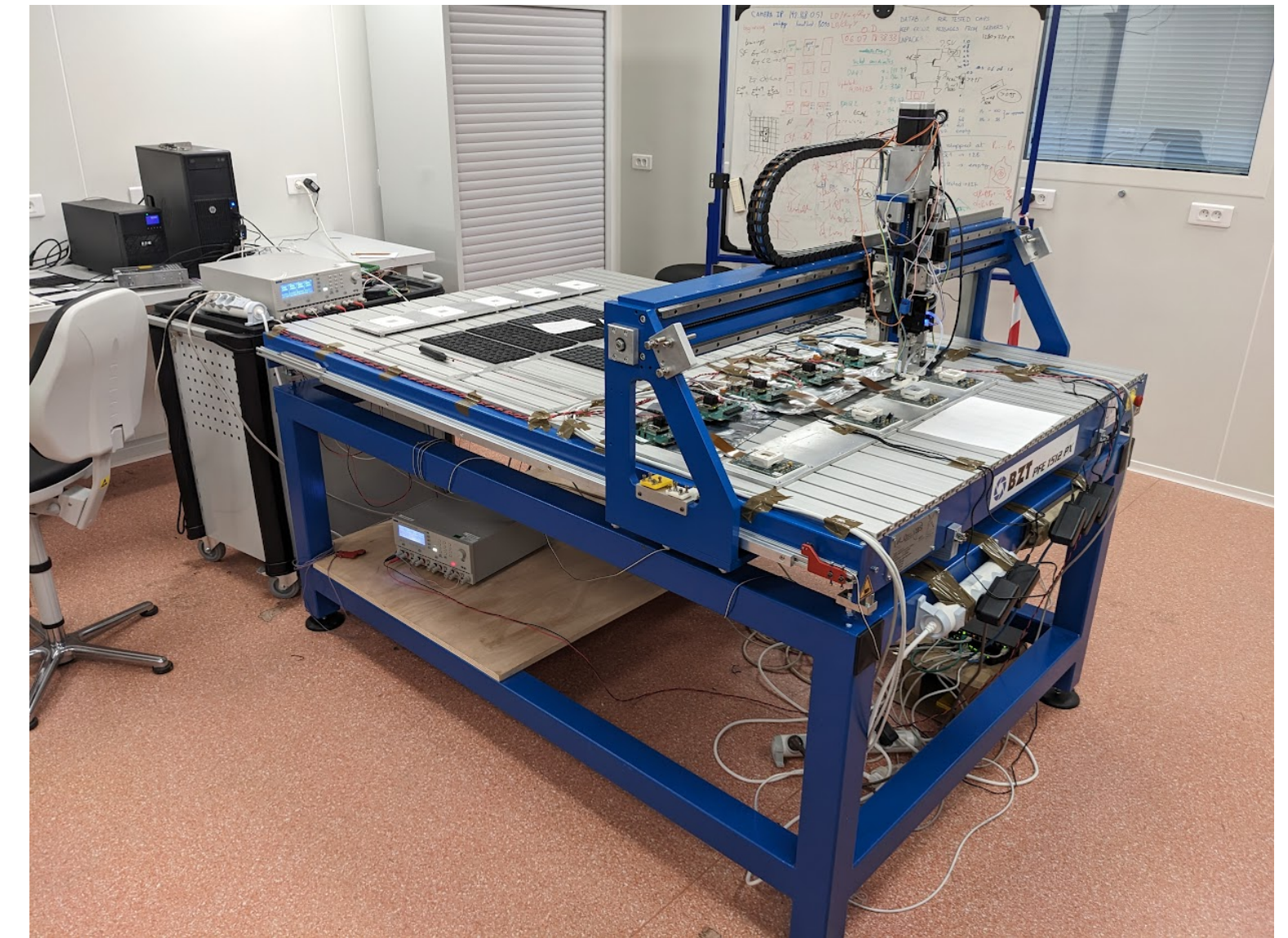
Formally 20% ePIC / 80% CMS for the moment

Supported by two electronics engineers, specializing in:

- ▶ Characterization of components (e.g. ASICs), silicon sensors
- ▶ Design of electronic boards for acquisition and triggering systems
- ▶ implementation of high-speed series links
- ▶ firmware programming & FPGA implementation

Engineers also currently about 20% on ePIC,
winding down of CMS Phase-2 upgrades will free up person-power

Robotic ASIC testing for CMS at LLR



PhD student leading ASIC testing effort for CMS HGCal
Punctual support for ePIC

A new postdoc will arrive in Sept. focusing on ASICs
50% ePIC / 50% CMS

We are hoping for further reinforcement of ePIC effort down the road

LLR ePIC plans

Physics interests: Gluon saturation, energy loss in CNM, possibly other topics

Current plans:

- ▶ Leverage our experience w/ ASICs & proximity to OMEGA to support lab and beam testing for ePIC calorimeters
- ▶ Investigate ASIC solution for EEEMCal, participate in shared beam tests with LFHCAL
- ▶ Generally provide electronics support for the EEEMCal effort at IJCLab

NB: We meet bi-weekly with our OMEGA & IJCLab colleagues to coordinate these activities

Future plans:

- ▶ Try to further integrate our electronics engineers according to their expertise, e.g., on the data acquisition side
- ▶ Integrate a new postdoc into the effort (50%), focusing on EEEMCal
- ▶ Start to get involved with ePIC software targeting simulation or reconstruction
(attended ePIC software & computing meeting at CERN this week)