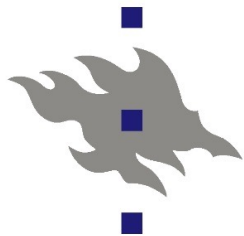


# HIP CMS experiment & CMS upgrade project evaluation: Introduction

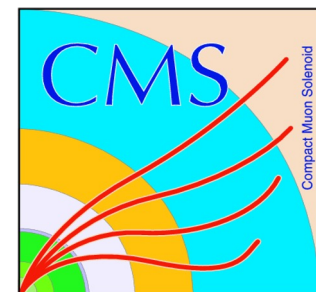
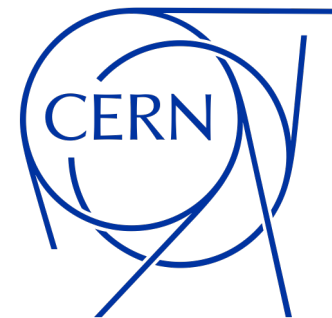


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K. Österberg,  
CMS programme director,  
Helsinki Institute of Physics,  
University of Helsinki

6.5.2024 at HIP



# HIP CMS programme

## Coordinating Finnish participation in CMS & TOTEM experiments @ LHC

four separate projects

(programme leader budget: ~100 k€)

CMS  
Kenneth  
Österberg

CMS Experiment  
Mikko Voutilainen

CMS Upgrade  
Erik Brücken

Tier-2 Operations  
Tomas Lindén

CMS Forward  
Kenneth Österberg

**CMS physics analysis, operation,  
offline work & tools**

(HIP project budget: 340 k€)

**CMS detector upgrades.  
detector R&D + applications**

(HIP project budget: 312 k€)

**LHC computing**

(HIP project budget: ~100 k€)

**CMS forward (& TOTEM): physics analysis,  
software, detector upgrades & operation**

(HIP project budget: ~110 k€)

**To be evaluated  
for their activities  
during 2022-2024  
& their plans for  
2025-2027**

# HIP CMS programme external funding

## CMS experiment:

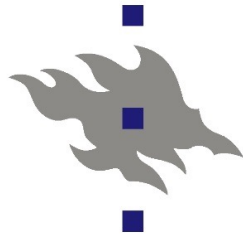
- 2022-25: H2020 ITN project “Synergies between Machine leArning, Real Time analysis and Hybrid architectures for efficient Event Processing and decision making (SMARTHEP)” (M. Voutilainen, H. Kirschenmann)
- 2022-27: **ERC CoG grant** “Jet energy calibrations for HL-LHC (**JEC4HL-LHC**)” (M. Voutilainen)
- 2023-27: **Research council of Finland fellowship** “Vector Boson Scattering in all-hadronic channel (**ForVVard**)” (H. Kirschenmann)

## CMS upgrade:

- 2023-27: WP leader in Academy of Finland project “Optimization of BNCT for cancer treatment at Helsinki University Hospital ” (E. Brücken)
- 2024-27: **Research council of Finland infrastructure funding** “Upgrade of the CMS tracking detector and construction of the ALICE FoCal detector for the HL-LHC” (E.Brücken)

However must apply for Research council of Finland roadmap status 2025-28 for “High lumi LHC” (in May 2024) to be able to apply for infrastructure grants to fund Finnish contribution to CMS Phase 2 upgrade & HL-LHC computing

# Experimental particle physics permanent positions



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- 2 professor positions (Voutilainen, Österberg)
- 1 university lecturer position (Brücken)
- 1 university researcher (Laurila) **new**



- 1 professor position (Luukka)
- 1 associate/full professor (being filled) **new**

In addition, new Finnish government seeks to shorten PhD studies from nominal 4 years to 3 years: **doctoral pilot programme launched** with new PhD students to start in autumn 2024 (2 experimental particle physics position both at UH & LUT)

# Programme of evaluation meeting

09:40	→ 11:40	<b>CMS experiment project evaluation</b> Convener: Mikko Voutilainen (Helsinki Institute of Physics (FI))
09:40		<b>Electroweak symmetry breaking exploration, deep learning and prompt calibration loop</b> ⌚ 30m Speaker: Henning Kirschenmann (Helsinki Institute of Physics (FI))
10:10		<b>New physics searches and triggers</b> ⌚ 30m Speaker: Santeri Laurila (CERN & Helsinki Institute of Physics (FI))
10:40		<b>Precision measurements with jets, jet energy corrections and preparing for HL-LHC exploitation</b> ⌚ 30m Speaker: Mikko Voutilainen (Helsinki Institute of Physics (FI))
11:10		<b>Discussion</b> ⌚ 30m
11:45	→ 12:45	<b>Sallad lunch + coffee/tea</b> ⌚ 1h
12:50	→ 14:30	<b>CMS upgrade project evaluation</b> Convener: Jens Erik Brucken (Helsinki Institute of Physics (FI))
12:50		<b>HIP involvement in the HL-LHC upgrades of the CMS detector</b> ⌚ 30m Speaker: Jens Erik Brucken (Helsinki Institute of Physics (FI))
13:20		<b>Detector development projects at HIP</b> ⌚ 30m Speakers: Timo Eero Hilden, Timo Eero Hilden (Helsinki Institute of Physics (FI)), Timo Eero Hilden (Helsinki Institute of Physics (FI))
13:50		<b>Discussion</b> ⌚ 40m
14:35	→ 15:25	<b>Visit to HIP detector laboratory</b> ⌚ 50m