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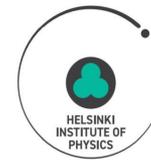
# RECFA midterm report - Finland

— Kati Lassila-Perini —  
Helsinki Institute of Physics  
13.07.2020 ECFA plenary

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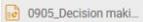
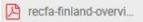
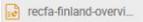
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# RECFA visit to Finland 18-19 May 2017

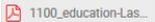
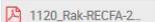


Agenda

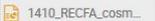
## Friday meeting: RECFA Open Session

- 09:00** **Welcome**  
Speaker: Keijo Hämäläinen (Vice-Rector, University of Helsinki)
- 09:05** **Welcome**  
Speaker: Riitta Majjala (Vice-President for Research, Academy of Finland)  
 0905\_Decision maki...  0905\_Decision maki...
- 09:15** **Introduction: HEP in Finland**  
Speakers: Paula Eerola (Helsinki Institute of Physics), Paula Eerola (Helsinki Institute of Physics (FI))  
 recfa-finland-overvi...  recfa-finland-overvi...
- 09:55** **CMS and TOTEM experiments**  
Speaker: Mikko Voutilainen (Helsinki Institute of Physics)  
 recfa\_2017\_05\_19\_...

## RECFA Open Session

- 11:00** **School activities, outreach and open data**  
Speaker: Kati Lassila-Perini (Helsinki Institute of Physics (FI))  
 1100\_education-Las...
- 11:20** **ALICE experiment**  
Speaker: Jan Rak (University of Jyväskylä (FI))  
 1120\_Rak-RECFA-2...
- 11:50** **Accelerator technology**  
Speaker: Kenneth Osterberg (University of Helsinki)  
 KO\_RECFA\_2017\_ac...  KO\_RECFA\_2017\_ac...  KO\_RECFA\_2017\_ac...

## RECFA Open Session

- 13:30** **Theory**  
Speaker: Alekski Vuorinen  
 RECFA17.pdf  RECFA17.pptx
- 14:10** **Cosmology**  
Speaker: Syksy Räsänen (University of Helsinki and HIP)  
 1410\_RECFA\_cosm...  1410\_RECFA\_cosm...  1410\_RECFA\_cosm...
- 14:40** **ISOLDE and FAIR, Jyväskylä Accelerator Laboratory**  
Speaker: Ari Jokinen (University of Jyväskylä (FI))  
 1440\_AJokinen\_RE...  1440\_AJokinen\_RE... 

## RECFA Open Session

- 15:50** **Applied projects: NINS3 and radiation metrology**  
Speaker: Teemu Siiskonen (Radiation and Nuclear Safety Authority (STUK))  
 1550\_Siiskonen\_EC...  1550\_Siiskonen\_EC...
- 16:20** **Technology transfer and industrial activation**  
Speaker: Pietari Kauttu (Helsinki Institute of Physics (FI))  
 CERN Knowledge Tr...  FI Companies Colla...  FI Companies Colla...
- 16:50** **Student view**  
Speaker: Jennifer Ott (Helsinki Institute of Physics (FI))  
 JO\_RECFA2017\_v2...

# Research areas

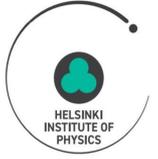
**Theory:** LHC physics, gravitational waves (LISA), cosmology (EUCLID), mathematical physics, FAIR physics, materials physics

**CMS and Nuclear matter:** particle and nuclear matter experimental collaboration with CERN, FAIR construction and starting experiments

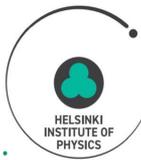
**Technology:** technology development connected to experimental activity, BIC

**Other projects:** CLOUD – laboratory study of cloud formation at CERN

Researcher education, societal impact



# Goals for 2017-2021



Recent CMS highlights:

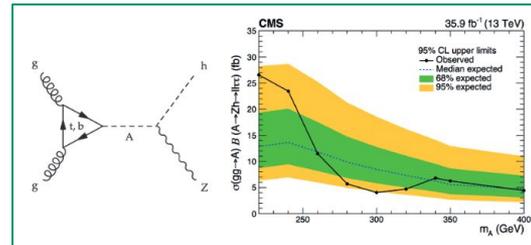
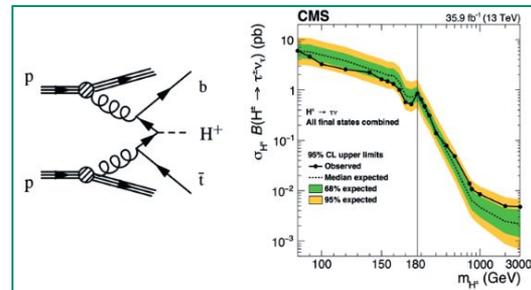


## THE NEXT FIVE YEARS 2017-2021

IN 2017

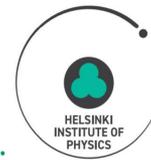
- Full exploitation of CMS and ALICE runs 2 and 3
- Secure funding for Finnish contributions for CMS and ALICE Phase-2 upgrades
- Further development of Cloud-computing resources and joint Nordic computing facilities
- FAIR facility and experiments: in-kind contributions, ramp up experimental activities
- Improved industrial return from CERN, reinforced technology transfer activities and project work (BIC, IdeaSquare, Aalto Design Factory, ATTRACT)
- Maintain present level of school activities, develop further open data exploitation
- HIP renewal: potential new HIP partners: STUK, VTT; potential synergies with neighbouring research fields (eg. fusion research)

NOW:



PhD theses by S. Laurila and J. Heikkilä 2019

# Goals for 2017-2021



Recent Alice highlight:



## THE NEXT FIVE YEARS 2017-2021

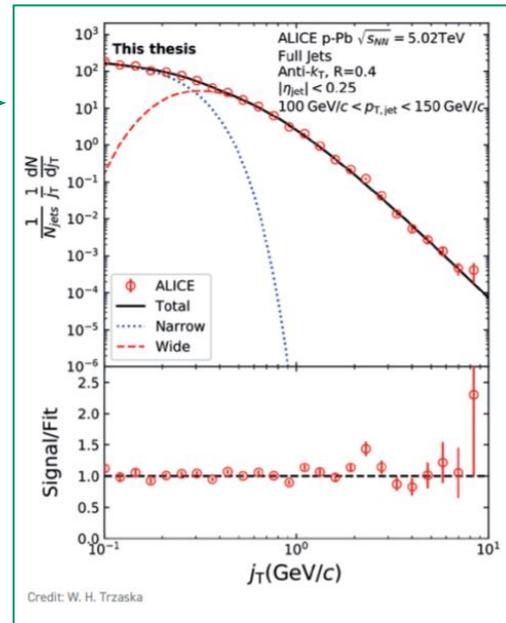
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P. Ferola

19.5.2017 28

NOW:



PhD thesis by T. Snellman 2019

# Goals for 2017-2021



Recent FAIR highlight:



## THE NEXT FIVE YEARS 2017-2021

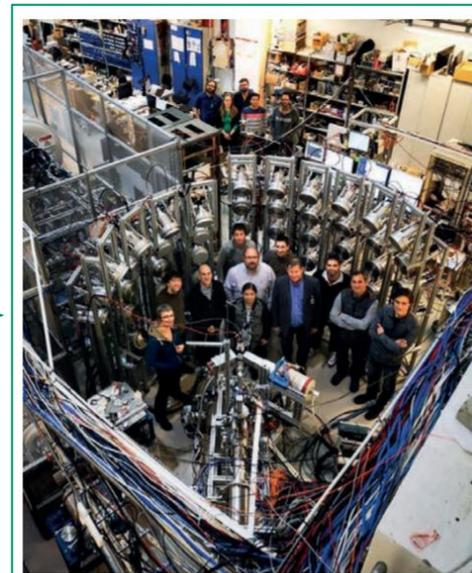
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P. Ferola

19.5.2017 28

NOW:



Credit: H. Penttilä

MONSTER neutron detectors were tested and exploited at the Accelerator Laboratory of the University of Jyväskylä as a part of the FAIR Phase-0 experimental campaign

# Goals for 2017-2021



## THE NEXT FIVE YEARS 2017-2021

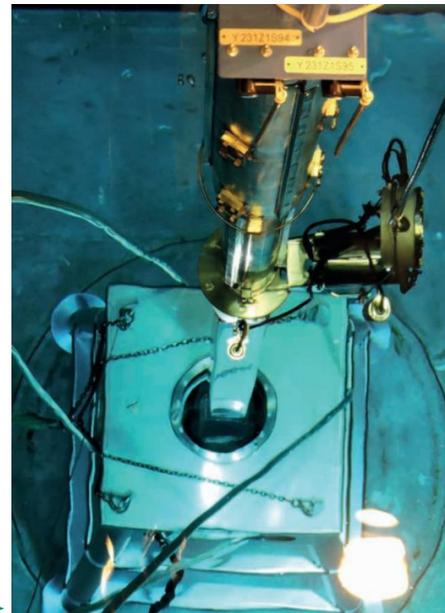
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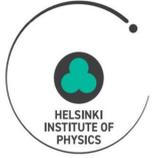


New topics:



Joint project with the Finnish Radiation and Nuclear Safety Authority, a first test at an interim fuel storage facility of the PNAR and PGET devices.

# RECFA feedback



Positive feedback and full support for

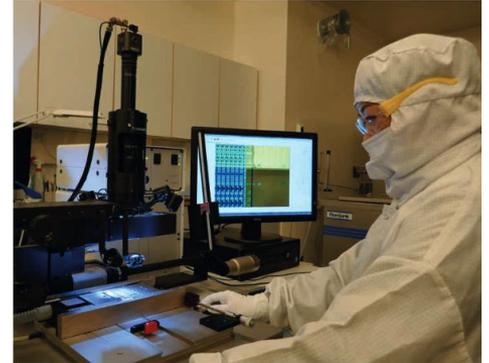
- Central coordination of research at CERN and FAIR through Helsinki Institute of Physics (HIP)
  - HIP has five member universities (the Universities of Helsinki and Jyväskylä, Aalto University, and the Tampere and Lappeenranta Universities of Technology) and is hosted by the University of Helsinki.



# Topics addressed in the RECFA report



- “contribution to the upcoming phase-2 upgrade to be secured”
  - Part of the required funds have been granted
  - More will be applied in 2021
- “broaden the scope of the research into areas such as neutrino physics or the science of e-e+ colliders”
  - We contribute to the R&D studies for CLIC- and FCC-colliders
  - Participation in neutrino physics experiments has not been increased.
  - Finnish researchers participate actively in the gravitational wave mission LISA.
  - Participation in dark matter experiments is under study.



A. Gädda reworking a CMS pixel module with the Kumpula Detector Laboratory flip-chip bonder. Credit: J. Ott.

# Topics addressed in the RECFA report

- “consider long-range planning for the Finnish HEP community”
  - The long term strategy of HIP, coordinating the Finnish HEP community activities, has been finalized this year.
- “The cooperation between Finnish theorists and experimentalists could be expanded”
  - In principle, [HIP seminars](#) could be a common discussion forum, but this remains an area to be improved
- “encourages further development of relations between the astronomy and particle physics communities”
  - Participation in LISA mission
  - HIP presents Finland in ApPEC

APPEC MoU signing. Credit: K. Link, APPEC.



# Topics addressed in the RECFA report



- “underlines the need for a well supported Industrial Liaison Officer”
  - Despite efforts, this has not been solved
- “encourages the development of accelerator education for graduate students”
  - To be followed up
- “provide sufficient computing and storage resources for the next decade and beyond”
  - National infrastructure funding has been received for a short-term demand

# Topics addressed in the RECFA report



- “highly appreciates the vital support from the Finnish National Agency for Education for the national CERN high-school network and hopes that this support will be maintained at the current level”
  - The support has been constant, reapplied every year



- “recommends help for PhD students to organise themselves into an association covering all Finnish sites and research projects”
  - Forming the RECFA ECR panel could give a positive impact on this

# Conclusions



- The RECFA report for Finland was very positive
  - We have continued on the same path with
    - Focused experimental particle physics program: CMS and Totem
    - Active nuclear matter research: Alice, Isolde and FAIR
    - Vibrant theory program
    - Technology program for related to HIP and big science
    - Special projects: Cloud, Euclid, Open data in education
- We have reviewed the recommendations in the RECFA report
  - Most of them have been addressed
  - This midterm report has served us as a good reminder to check the status of the remaining issues.