PID & Photo-detector Session
Welcome & ECFA TF4

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PPTAP detector workshop

Science and Technology Facilities Council

AIMS OF THE WORKSHOP:

1. Gather input from the community to draft the UK roadmap to detector R&D following ECFA symposia consultation phase.
2. Highlight common interests between groups and with industry.
3. Gather visions for R&D structure in the next years.

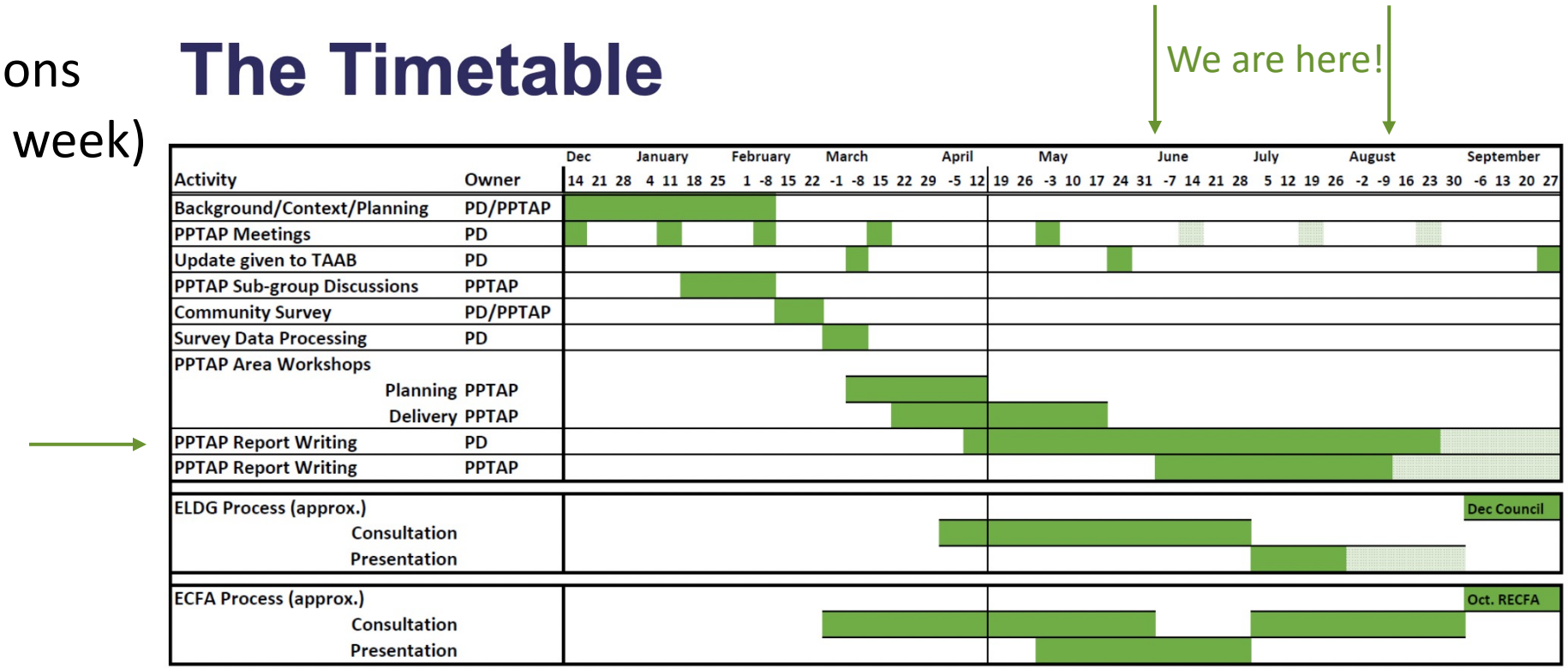
Sample of questions for discussion:

- What are the key technical challenges for the UK in each R&D area?
- What are the organisational / logistical barriers for us?
- How much is all this going to cost? Is it justified?
  -- What is the likely UK participation in future projects?
  -- What is the length, breadth and scale of R&D activities leading to them?
  -- Are there commonalities we can exploit?
  -- What demonstrator / exemplar projects should we target, and when?
- How do we ensure and maintain efficiency?
  -- Commonalities between projects
  -- Reduction of internal design competition
- What happens if we do nothing?
- What is the relationship with industry and other research areas?
- How do we convince people to act on this?
- How do we sustain a community?

Community Input - Timeline & Process

- Opportunities to collect inputs from:
  - PPTAP Survey
  - Emails/Discussions
  - Workshop (this week)

The Timetable

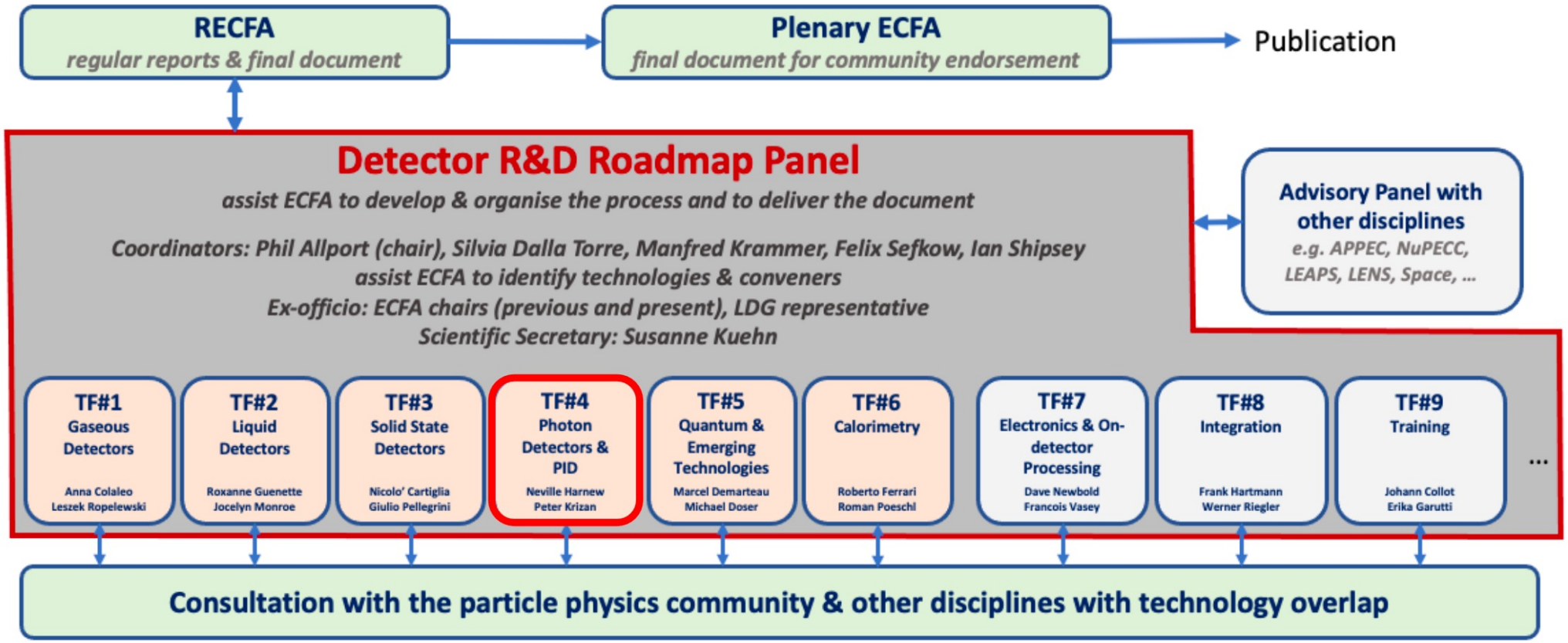


Science and Technology Facilities Council

Community Input - Timeline & Process

- Opportunities to collect inputs from:
  - PPTAP Survey
  - Emails/Discussions
  - Workshop (this week)
- **Inputs will continue to be gathered during the Report Writing phase**
  - Discussion session at the end of the PID & PD session
  - Funding Structure session at the end of the workshop (this afternoon)
  - Reach out to me by email and let's have a chat!
- Any further information, please contact PPTAP.
- Also upload here: https://cernbox.cern.ch/index.php/s/rys2rDL7pRkzglb

Organization for Consultation of Relevant Communities



https://indico.cern.ch/e/ECFADetectorRDRoadmap

ECFA
European Committee for Future Accelerators

Process and Timeline

Organisation

May 2020
EPPSU mandate to ECFA to develop a roadmap for detector R&D efforts in Europe

Sep 2020
Structure in place with **Detector R&D Roadmap Panel**

Dec 2020
Task Forces active

Website:
https://indico.cern.ch/e/ECFADetectorRDRoadmap

Expert & Community Consultation

Feb 2021
Collection of requirements of future facilities & projects

Feb/March 2021
Questionnaires of Task Forces to national contacts

Task Forces liaise with experts in
- ECFA countries
- adjacent disciplines
- industry

March-May 2021
Open Symposia

Drafting Roadmap & Feedback

May 2021
Task Forces collate input from symposia

25-28 May 2021 **Drafting sessions**
- opening session with all experts involved
- plenary & parallel sessions with Task Force members
- final session of Roadmap Panel

July 2021
Near final draft shared with RECFA*

30 July 2021
Presentation at Joint ECFA-EPS session

Until Sep 2021
Collect final community feedback*

Oct 2021
Detector R&D Roadmap Document submission to RECFA and afterwards to PECFA and Council

*community feedback via RECFA delegates and National Contacts

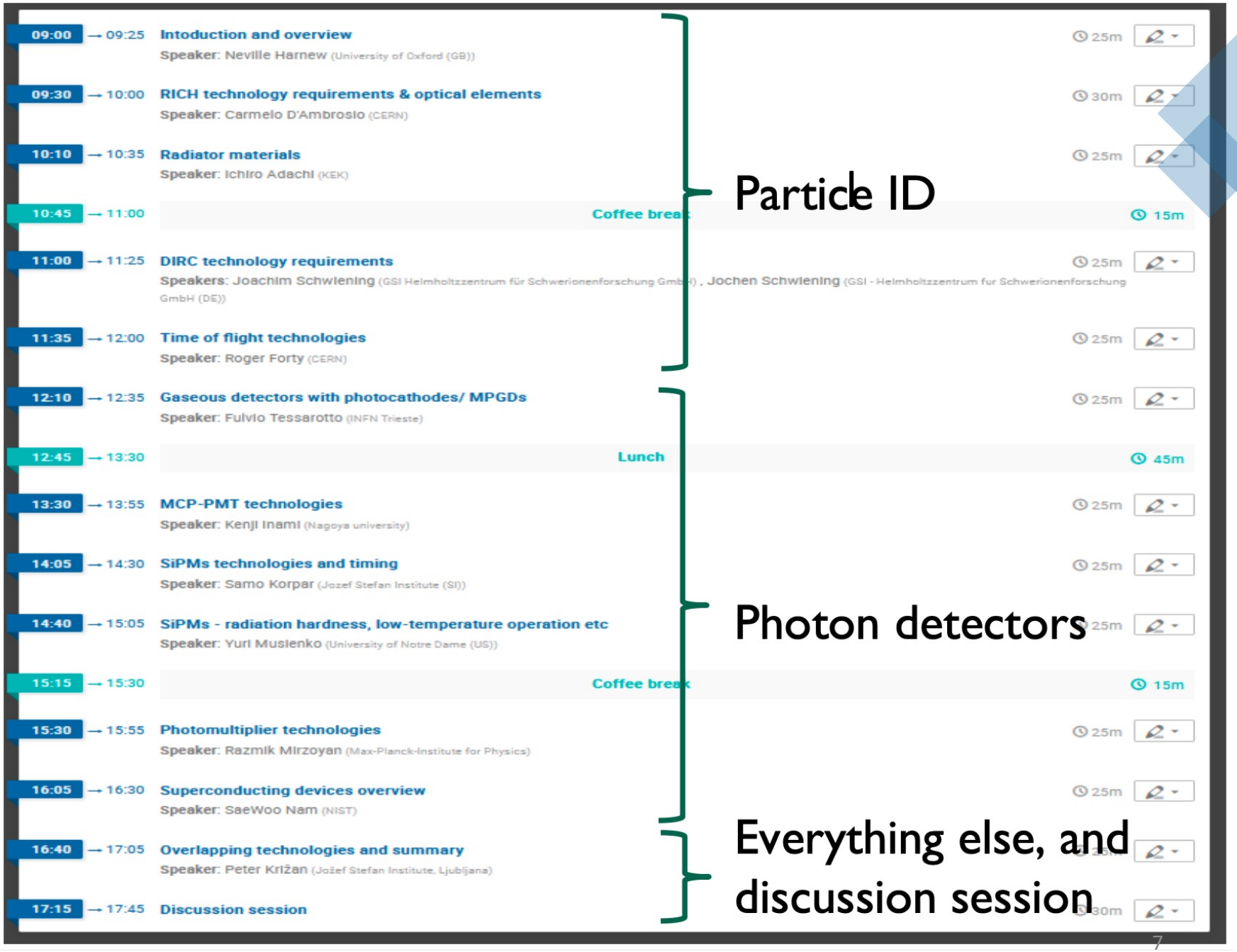
Community consultation:

- ECFA TF4 survey sent out to country representatives
- PPTAP also provided detailed inputs and feedback based on info gathered from UK community

TF4 Symposium on May 6th → see agenda from

- Neville Harnew (Oxford)
- Peter Krizan (Ljubljana)
- Comprehensive content, well attended and fruitful discussions

https://indico.cern.ch/event/999817/



Courtesy of Neville Harnew

Facility requirements : Particle Identification

Projects	Timescale	RICH (high and low momentum PID)	Time of flight and DIRC	RPC technologies	TRD & dE/dx
Panda/CBM (Fair/GSI)	2025	✓	✓	✓	
NA62/KLEVER/TauFV	2025	✓	✓		
ALICE	2026-27 (LS3) – 2031 (LS4)	✓	✓	✓	✓
Belle-II	2026	✓	✓		
Neutrino long baseline	2027				
LHCb	2031 (LS4)	✓	✓		
ATLAS-CMS	2031 (LS4) - 2035 (LS5)				
Non accelerator & particle astro	--				
EIC	2031	✓	✓		
ILC	2035				
CLIC	2035				
FCC-ee	2040	✓	✓		✓
Muon-collider	> 2045				
FCC-hh	> 2050				

* Table layout: with thanks to Didier Contardo

Courtesy of Neville Harnew

Facility requirements : Photon Detectors

Projects	Timescale	SiPM technology	MCP-PMT technology	Large diameter PMT technology	Scintillating fibres & new scintillating materials	CCDs & superconducting devices
Panda/CBM (Fair/GSI)	2025	✓	✓			
NA62/KLEVER/TauFV	2025	✓	✓			
ALICE	2026-27 (LS3) – 2031 (LS4)	✓	✓			
Belle-II	2026		✓			
Neutrino long baseline	2027	✓		✓	✓	
LHCb	2031 (LS4)	✓	✓		✓	
ATLAS-CMS	2031 (LS4) - 2035 (LS5)	✓				
Non accelerator & particle astro	--	✓		✓	✓	✓
EIC	2031	✓	✓		✓	
ILC	2035	✓			✓	
CLIC	2035	✓			✓	
FCC-ee	2040	✓	✓		✓	
Muon-collider	> 2045	✓				
FCC-hh	> 2050	✓				

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PPTAP PID & Photon Detector Agenda

09:00 → 12:00 **PID and Photodetectors**

Convener: Angela Romano (University of Birmingham)

09:00	**Welcome & ECFA TF4** **Speaker**: Angela Romano (University of Birmingham)	20m
09:20	**PID - Time of Flight R&D** **Speaker**: Thomas Blake (University of Warwick)	30m
09:50	**PID - RICH R&D** **Speaker**: Michael McCann (Imperial College)	30m
10:20	**R&D on position sensitive photon detectors** **Speaker**: Silvia Gambetta (The University of Edinburgh (GB))	30m
10:50	**R&D on photon detection in the noble liquids** **Speaker**: Henrique Araujo (Imperial College London)	20m
11:10	**R&D on SiPMs in Liquid Argon Experiments** **Speaker**: Andrzej Szelc (University of Edinburgh)	20m
11:30	**Discussion**	30m

Concluding Remarks

- Content of today reflects inputs gathered so far.
- The UK community feedback from this workshop and requirements will be paramount in the roadmap drafting process → all voices will be heard!
- Collaborations, instead of competition. Identify synergies and common interests between groups and industry (particularly relevant for PD where IP is hold by few manufactures)
- Opportunity for impact and establishing R&D strategy/guidelines for approved physics case
- What are UK strengths, expertise, experiences in R&D? What are the aspects/weaknesses that needs to be improved on/developed? What can we learn from the past and improve for the future?
- Ultimately understand the case for investment in PID & PD R&D in UK
- Discussion is very important → all speakers please stay on time