

# ECFA

European Committee for Future Accelerators

## ECFA-UK European Strategy Initiative: Physics kick-off

Sarah Williams (University of Cambridge)

On behalf of the ECFA-UK plenary ECFA and ECFA-ECR delegates

Plenary ECFA: Daniela Bortoletto, Sinead Farrington, Joel Goldstein,  
Haroon Rafique, Aidan Robson, Matthew Wing

UK ECFA-ECR: Julia Allen, Holly Pacey, Patrick Dougan, Atanu Modak

# Introduction

- Welcome and thank you to all of you for making time (either 'live' or through the recording) to follow this meeting.
- This is the first of several meetings/workshops aiming to encourage UK engagement in the scientific input to the next European Strategy Update.
  - Deadline for written input 31 March 2025.
  - Aim to conclude process by June 2026.
- In the UK the preparation of scientific input and the drafting of the national consensus will proceed in parallel to the PPAN (Science Board) road-mapping process. Some topics will be discussed in both however the outcomes will be different- we all need to work together!

# Aims of today

1. Bring together the theory/experimental community for the first time prior to the next EPPSU.
2. Set the scene on the ESPPU and review the international context and studies.
3. (Where available) set out the task lists, and discuss the challenges, from the areas listed above
4. Encourage people to sign up, discuss preliminary steps, and be ready to show results in the next workshop.

# Physics topics covered

- $e^+e^-$  colliders
- ep colliders
- 10 TeV pCM colliders (muon, pp)
- Neutrinos
- Direct dark matter detection
- Other non-collider experiments/facilities
- Quantum technologies

**Many thanks to  
the speakers for  
their time  
preparing for  
today's event!**

# Diversity in our field

- Obvious comments: these physics cover a diverse range of fundamental questions/ technological challenges and there are lots of overlaps/synergies between them!
- Timescales/ priorities are also different for different areas => some experiments/groups may not be planning specific briefing book submissions. For those areas the speakers will highlight key milestones/activities expected ahead of the next ESU.
- We hope this initiative will also build understanding within the community of the landscape/challenges across the whole field.

# The road ahead

**High-level goals: discuss the physics/technologies first, before discussing the national consensus!**

- Today: kick-off for physics discussions/studies.
- May/June [tbd]: equivalent kick-off for accelerator/detector technologies.
- June-September 2024: physics studies ongoing, in discussion with physics chairs and ECFA-UK workshop organisers.
- 23-26 September 2024: ECFA-UK workshop: theoretical overviews of physics drivers (dark matter/ QCD/ EWK / flavour), discuss status of physics studies and next steps.
- September/October 2024 [tbd] 1-day ECFA-UK workshop on detector/accelerator technologies.
- October 2024 [tbd]: community drafting day to be organized by PPAP/ECFA.
- November 2024-March 2025: Additional community drafting days to finalise the national input to the ESU.

# Today's meeting

- After an overview of the ESU process (thanks Jon) we will have short (10-15) minute talks in each area by speakers who will also help chair the September workshop.
- We will be strict with time, but feel free to follow-up with additional questions offline.
- We hope today will provide a respectful and inclusive environment to discuss the future. Please respect the [CERN code of conduct](#)

14:15	→ 14:55	Introduction	
14:15		<b>Introduction by the organisers</b>	⌚ 10m
		Speaker: Sarah Williams (University of Cambridge)	
14:30		<b>Overview of the European strategy process</b>	⌚ 15m
		Speaker: Prof. Jon Butterworth	
14:55	→ 16:00	Intensity/Energy frontier colliders	
14:55		<b>e<sup>+</sup>e<sup>-</sup> colliders</b>	⌚ 15m
		Speaker: Prof. Guy Wilkinson	
15:15		<b>ep colliders</b>	⌚ 15m
		Speaker: Prof. Uta Klein	
15:35		<b>10 TeV pCM colliders (i.e. muon, 100 TeV pp)</b>	⌚ 20m
		Speakers: Prof. Andy Pilkington, Dr Karol Krizka	
16:00	→ 16:15	(Online) Break	⌚ 15m
16:15	→ 17:35	Flavour and neutrino physics, and dark sectors	
16:15		<b>Direct dark matter</b>	⌚ 15m
		Speaker: Dr Sally Shaw	
16:35		<b>Neutrinos</b>	⌚ 15m
		Speaker: Dr Kirsty Duffy	
16:55		<b>Other non collider experiments and activities</b>	⌚ 15m
		Speakers: Dr Carl Gwilliam, Prof. Mark Lancaster	
17:15		<b>QTFP</b>	⌚ 15m
		Speaker: Prof. Ian Shipsey	

# Call to action

- The next European Strategy Update is a pivotal point for High Energy Physics for the coming decades => we should be aiming make our mark on it.
- This is a great opportunity to bring the community together- we want to promote more interaction between the theory/experimental communities and between the physics/technology sectors.
- We particularly encourage ECR participation => you will need to lead and deliver the future roadmap.