

Particle Physics Advisory Panel (PPAP)

Andrea Banfi*

Annual Theory Meeting

IPPP Durham

14th December 2023

* Partly adapted from existing presentations by PPAP former chair Matthew Needham

Outline

- Summary of PPAP activity in 22/23
- Input needed from theory community
- How to best engage with theory community?

PPAP

Particle Physics Advisory Panel (PPAP) is one of five STFC advisory panels, mandate as currently defined

‘The purpose of the Advisory Panel is to provide a link between Science Board and the community and represent the needs of the community to STFC.’

<https://www.ukri.org/who-we-are/stfc/how-we-are-governed/advisory-boards/particle-physics-advisory-panel/>

Current Panel Membership

- **Ruben Saakyan – UCL (Chair)**
- Andrea Banfi – University of Sussex
- Tracey Berry – Royal Holloway
- Andy Buckley – University of Glasgow
- Davide Costanzo – University of Sheffield
- Henning Flaecher – University of Bristol
- Marco Gersabeck – University of Manchester
- Elena Gramellini – University of Manchester
- Helen O’Keeffe – University of Lancaster
- Arttu Rajantie – Imperial College London
- Rebecca Seviour – University of Huddersfield
- Jessica Turner – University of Durham
- Sarah Williams – University of Cambridge

Membership Calls

Partial rotation of membership each year:

Consider volunteering for this role

<https://www.ukri.org/about-us/stfc/how-we-are-governed/advisory-boards/call-for-applications/>

or other panels such as Science Board

<https://www.ukri.org/about-us/work-for-us/join-an-advisory-committee-panel-or-network/stfc-science-board-ppan-members/>

It is important, interesting and rewarding

Strategic review highlights importance of community engagement with STFC panels

“Members of the particle physics community should be encouraged by STFC and senior physicists to put themselves forward for membership of committees in STFC, UKRI and beyond, particularly important strategic ones such as the IAC.”

PPAP activity

- Activity is demand driven
 - We aim at meeting the needs of the community
 - We provide interface between the community and STFC/Science board
- We meet every ~two months at the moment, or more frequently if needed
- Engagement with community
 - IoP APP and HEPP Annual Conference
 - Annual community meeting
- Respond to requests for advisory information from STFC/stakeholders (e.g. input to UKRI infrastructure bids)
- (Current) mandate to keep the road map up to date
 - 2021 roadmap <https://stfc.ukri.org/files/ppap-2021-roadmap-final/>
 - Strategic review recommends update this year

Recent Activities/discussions

- Discussion and feedback on the [Strategic Review of Particle Physics](#)
- [STFC Visions](#) (launched in September 2022)
- Letter of support for Strategic R&D program sent to Science Board
- ECR forum
- Annual Community meeting in Birmingham, July 2023
- Review of proposals for UKRI Infrastructure Wave 4

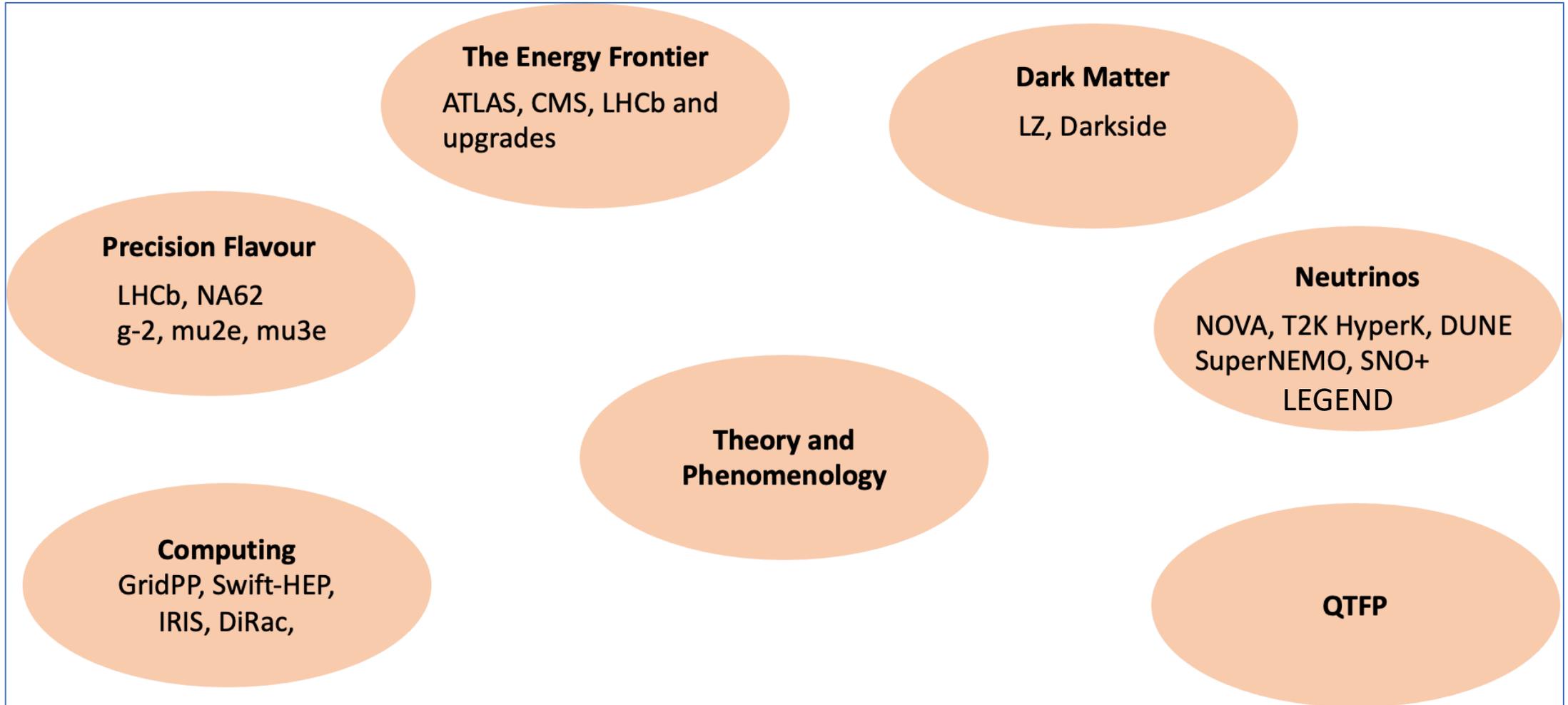
The current program

- This is largely based on the last roadmap exercise completed in 2021

<https://www.ukri.org/wp-content/uploads/2020/06/STFC-210322-PPAP-2021-Roadmap.pdf>

- The roadmap followed on from the 2020 European Strategy update and endorsed its recommendations
- Described the current program and future opportunities

The current program



Strategic Review of Particle Physics

- Particle Physics Strategic Review Committee (PPSRC), formed in spring 2022, drafted a [Strategic Review of Particle Physics](#)
- PPAP discussed the strategy and provided feedback
- The review identified the need for a prioritized roadmap
- Following the review, the Science Board was split into PPAN and Facilities. PPAN will indicate strategic priorities for the new roadmap
- PPAP is discussing how to better advise PPAN on priorities, e.g. keeping briefing documents for each science area, containing
 - Short documents on key science points, alignment with roadmap, community engagement, international context, UK leadership, etc.
 - Scenarios with implications of different levels of funding

Infrastructure call

The Wave 4 infrastructure call proposals for preliminary activities were submitted to PPAP in July 2023

- We received 5 new proposals + 4 resubmissions
- We were asked to provide select up to 3 projects to put forward to UKRI. Resubmitted projects did not count towards the 3 but we were asked to comment and rank if feasible

Wave 5 infrastructure call expected for Spring 2024

New early-stage projects can be submitted at any time through [STFC Visions](#)

Infrastructure Call: Wave 4

New projects:

HALHF

Precision muons

Particle Beamline

XLZD@Boulby (through Visions)

QUEST-DMC

Resubmissions

• AION (selected by PAAP)

• DATUM

• SOLAIRE

• TRITON (selected by QTFP)

Infrastructure Call: Wave 4

HALHF

Plasma Wakefield
Accelerator for Higgs
factory

Precision muons

Trackers for low-
energy experiments
with muons at PSI

QUEST-DMC

Cryogen-free sub-mK
cryostat for quantum
sensing

DATUM

Assembly facility for HPGe
detectors for neutrino/DM
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SOLAIRE

Experimental facility for
astrophysical neutrinos
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QUEST-DMC @Boulby

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Annual community meeting

Two-day community meeting took place in Birmingham July 6-7

<https://conference.ippp.dur.ac.uk/event/1197/>

The meeting focused on *forward-looking* strategic topics for the community

- Strategy Review update / STFC Visions
- Detector R&D
- CERN programme to 2040 / Future colliders
- Boulby laboratory and dark matter searches
- Quantum Technologies for Fundamental Physics
- Neutrinos, flavour and muon physics
- Theory and its interplay with experiment
- Computing

What input from the theory community?

Infrastructure call. These are multi-million projects that will shape the UK involvement in particle physics for the next two decades

- Which project would constitute priority for the theory community?
 - Collider physics (HALHF, precision muons)
 - Neutrino, dark matter (DATUM, SOLAIRE, XLZD)
 - Quantum sensors (QUEST-DMC)
 - ...
- At the PPAP meeting, the participants (mostly experimentalists) expressed strong endorsement of the development of Boulby national lab. Is this the view of the theory community as well?

What input from the theory community?

PPAP community meeting. The community would welcome larger theory representation.

- Speaker for the theory talk, so far chair of Particle Physics Grant Panel (Theory)
- Topics for the theory talk, e.g.
 - Outcome of consolidator grant
 - Funding opportunities for theoretical research
 - Theory vision
 - ...
- Input to discussion on computing and quantum technologies, e.g.
 - Which computing resources (CPU, GPU, quantum computing)
 - Sustainability issues
 - ...

What input from the theory community?

Strategy documents. The next European Strategy for Particle Physics is due in 2027. What input from the UK community?

- Are strategy documents, e.g. PP Strategic Review, regularly discussed within theory groups?
- PPAN (new Science Board) will elaborate a strategic prioritization
 - In the current UK strategy, theoretical activities were left as open as possible: should it still be the case?
 - Should the theory community recommend pursuing strategic experimental developments?
- Input is needed to draft the theory briefing document that will be used by PPAP to advise PPAN on strategic directions

Infrastructure call / Visions. Theory input is welcome to advise on which science questions could be prioritized.

How to engage with the theory community?

Communications. These are currently embedded in the Hi-fi newsletter

- Is this the best way to reach the theory community?
- The newsletter is addressed to CG PIs, who do not always coincide with Heads of theory groups. Is this an issue? Do important communications reach group members?
- Do theory groups have time/energies to discuss the updates in the newsletter?
- Should PPAP ask for regular inputs from the theory community? How?
 - Anonymised polls (e.g. google)
 - Formal questionnaires filled in by CG PIs (or HoGs)

Questions ?