WP1: Introduction

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DUNE-UK Collaboration Call

Monday 17th January, 2022

WP1 Organisation

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                    │    DUNE-UK FD       │
                    │ Construction Project│
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WP1: Physics	WP2: DAQ	WP3: APAs

WP1.1 Oscillation Physics*	WP1.2 Reconstruction	WP1.3 Computing	WP1.4 Calibration & Commissioning*
Liverpool Cambridge	**Warwick Lancaster Cambridge**	**Edinburgh Manchester RAL**	**Sheffield** **Oxford UCL Sussex**

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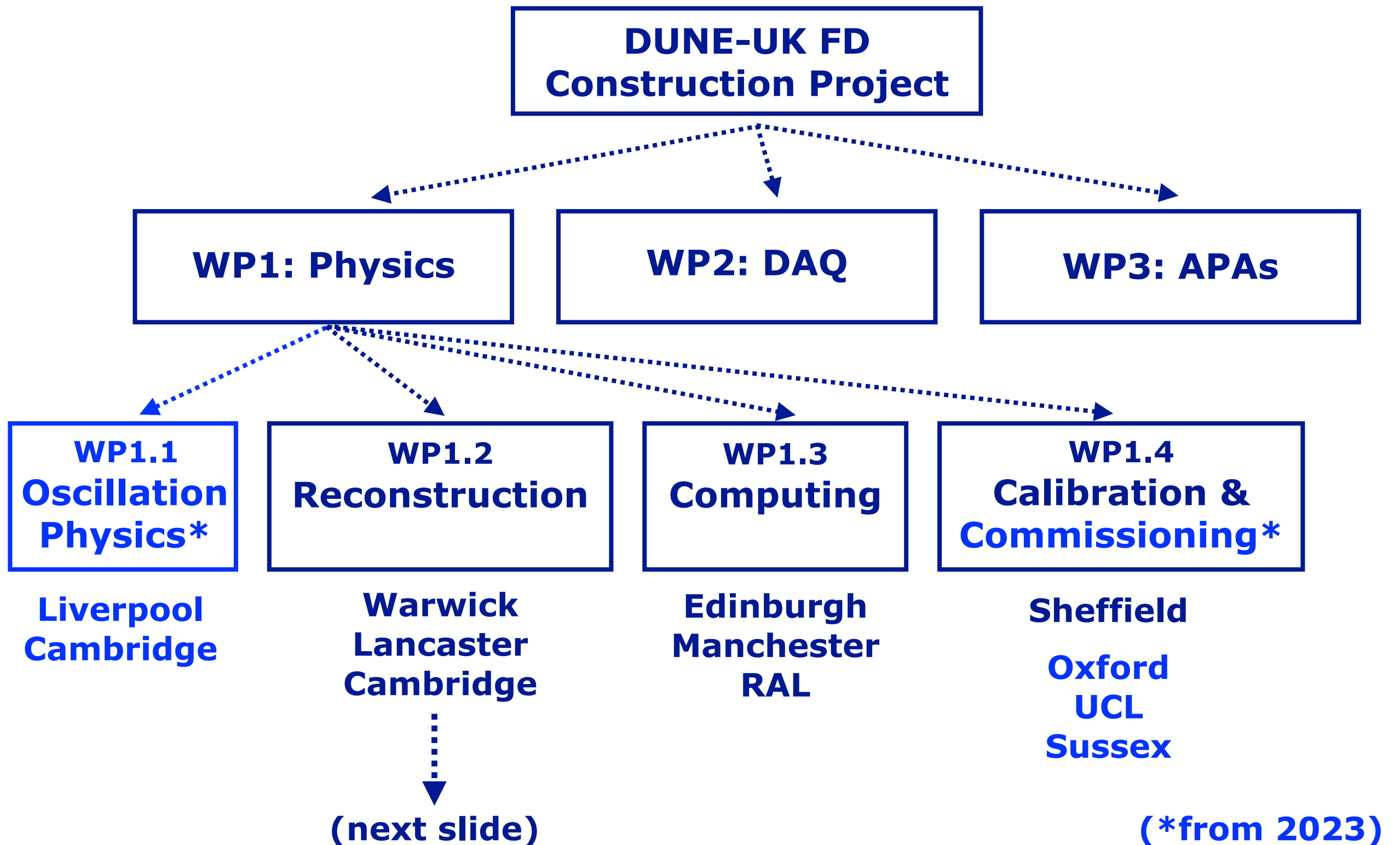
(*from 2023)

WP1.2: Reconstruction

Core Reconstruction Algorithms

WP1.2.1
Core Pandora
pattern recognition

WP1.2.2
Deep Learning
in Pandora

WP1.2.3
High-level
Reconstruction

Event types

Accelerator Neutrinos

Technologies

Horizontal Drift

Benchmarking

WP1.2.4
Atmospherics, Cosmics,
Proton Decay

WP1.2.5
Vertical Drift

WP1.2.6
ProtoDUNE's

Recent Highlights

- **Deep Learning in Pandora (A. Chappell, R. Cross)**
  - ➢ DL-based hit classifiers fully plumbed into Pandora reconstruction chains.
  - ➢ New DL-based algorithms under development, particularly shower-growing.

- **Vertical Drift reconstruction chain (M. Brunetti, D. Brailsford)**
  - ➢ Complete chain of pattern recognition in place for Vertical Drift detector.

- **ProtoDUNE-SP paper for Pandora performance (L. Whitehead)**
  - ➢ Paper draft looks excellent! DUNE paper committee has been set up.

- **Workflow management (A. McNab, R. Nandakumar, F. Wilson)**
  - ➢ UK is leading this important area, and proof of concept is ready.

- **dE/dx calibration (R. Jones, V.Kudryavstev)**
  - ➢ New calibration tool has been developed using through-going muons.

- **ND reconstruction (M. Uchida, A. Moor, J. Back)**
  - ➢ Progressing well! Off-project, but supported by UK-Reco group.

This Meeting

2:40 PM → 4:40 PM **DUNE WP1: Physics and Computing (part I)**

Introduction

Speaker: Andrew Blake (Lancaster University)

DUNE-UK Computing update **WP1.3**

Speaker: Andrew McNab (University of Manchester)

Cosmic-ray calibration update ¶ **WP1.4.1**

Speaker: Rhiannon Jones

Pandora reconstruction for the Vertical Drift detector **WP1.2.5**

Speaker: Dominic Brailsford (Lancaster University)

Reconstructing atmospheric neutrinos using Pandora **WP1.2.4**

Speaker: Maria Brigida Brunetti (University of Warwick)

Deep Learning network for shower growing **WP1.2.2**

Speaker: Ryan Cross (Lancaster University)

ProtoDUNE reconstruction studies

Speaker: Kang Yang (Oxford)

ND-GAr-Lite tracking studies

Speaker: Federico Battisti (Oxford)

Simulating scintillator light in DUNE

Speaker: Patrick Green