

Physics

Lancaster  
University



# **WP1: Introduction**

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**DUNE-UK Meeting**

**Thursday 12<sup>th</sup> January, 2023**

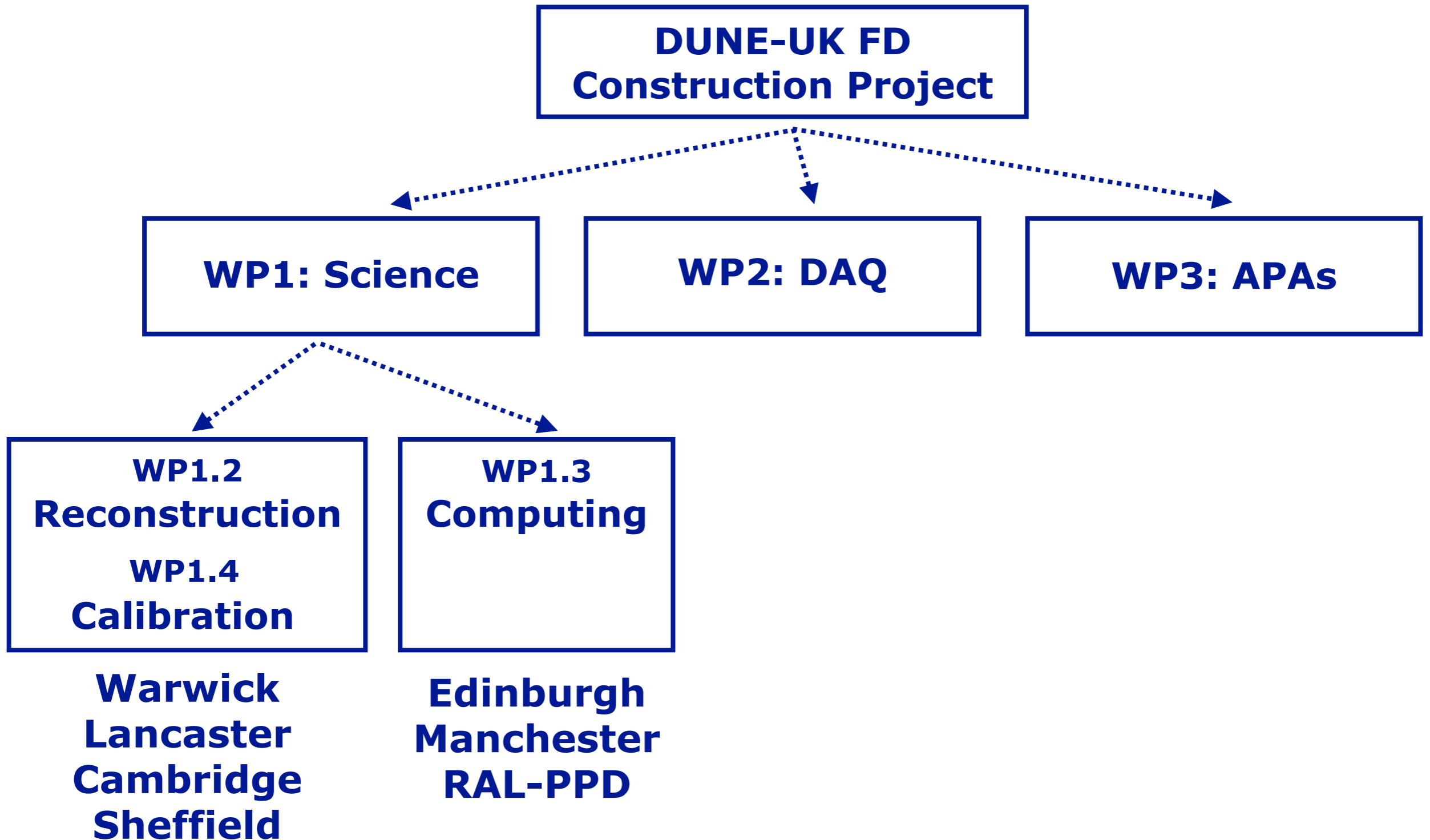


**DEEP UNDERGROUND  
NEUTRINO EXPERIMENT**

# Overview

- **The goal of WP1 is to develop the essential reconstruction software and offline computing for DUNE-FD data-taking.**
  - The construction of DUNE software and computing is critical for the successful commissioning of its detectors and the delivery of its physics programme!
  - The UK groups have recognised expertise in these areas and are playing a leading role in the DUNE collaboration and consortia.
- **WP1 has three active sub-packages:**
  - WP1.2: **Reconstruction Software.**
  - WP1.3: **Offline Computing.**
  - WP1.4: **Calibration Algorithms.**
- **In addition to the PDRAs working across all sub-packages, several PhD students are contributing to WP1 activities.**
  - There are many opportunities to get involved!

# WP1 Organisation



# Reconstruction & Calibration

- **The UK-Pandora software provides a pattern recognition solution for every DUNE-FD detector design and event type.**
  - Performance proven on real data, e.g. protoDUNE.
- **The versatility of the Pandora reconstruction is enabled by its multi-algorithm design.**
  - Implements a range of reconstruction approaches from Deep Learning to traditional clustering algorithms.
  - Powerful (and novel) techniques such as “re-clustering”.
  - Bespoke algorithm chains for different event types.
- **High-level tools provide the bridge to physics and enable physics-driven algorithm development.**
- **Pandora outputs provide the basis of cosmic-ray calibration algorithms. UK now leading calibration strategy for DUNE.**


# Offline Computing

- **The UK groups are playing a key role in the development and deployment of the critical computing systems for the production and management of DUNE data.**
- **The UK is firmly integrated in the international Computing Consortium, and UK-led contributions are essential to the success of the DUNE computing project.**
  - Roles and responsibilities now detailed in Computing CDR.
- **Key areas of work:**
  - Data management and movement, including development of RUCIO software for DUNE (Edinburgh)
  - Development of the workflow system (Manchester, RAL-PPD)
  - Key monitoring responsibilities e.g. ETF, CRIC.
- **Off project, the UK is the largest contributor of Grid capacity outside of the USA.**

# This Meeting

- Lots of progress to report from the past six months!

## 9:00-10:45am: Reconstruction, Computing and Calibration

09:00	Introduction	Andrew Blake	09:00 - 09:05
	UK Capacity	peter clarke	09:05 - 09:15
	Computing update	Andrew McNab 	09:15 - 09:40
	Pandora update	Maria Brigida Brunetti	09:40 - 10:10
10:00	Low-energy reconstruction	Matthew Osbiston	10:10 - 10:25
	Calibration update	Rhiannon Jones	10:25 - 10:45

## 10:45-11:05am: DUNE Education and Outreach

11:00	DUNE Education and Outreach	Kate Shaw	10:45 - 11:05
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