

# UK Project Status

Gary Barker

LBNF/DUNE UK Meeting, Daresbury  
July 2022

# Leadership Changes



**Lia Meringa** becomes  
FNAL Director



**Rich Stanek** takes over  
as PIP-II Project  
Director



## DUNE Collaboration Management

Co-spokespersons  
FD1 Technical Coordinator  
FD2 Technical Coordinator  
ND Technical Coordinator  
Physics Coordinators  
International Resource Coordinator

## LBNF/DUNE-US Project

Project Director  
Deputy Project Director  
Deputy Project Director for Facilities  
Deputy Project Director for Far Detectors  
Deputy Project Director for Near Detectors  
Project Manager

## LBNF/DUNE Joint Project Office

ESH  
Legal  
Procurement  
Compliance  
Project Controls  
Systems Engineering  
Quality Assurance  
Risk Management  
Financial Management  
Review Office

## Deputy Project Director for Facilities

FSCF-EXC SP  
PM  
NSCF+B SP  
PM  
NSCF  
Dep PM  
Beamline  
Dep PM  
FSCF-BSI SP  
PM

## Deputy Project Director for Far Detectors

FDC SP  
PM  
Dep PM CD Readiness  
Shared Technical Coordination Support  
Dep PM Cryo  
Cryostats PM  
Cryo Sys+LAr PM  
Infrast PM  
Install PM  
FS Facility  
Sup & Ser  
DUNE  
FD1 TC  
Dep PM FD1 & FD2  
Compt PMs  
DUNE  
FD2 TC  
Compt PMs

## Deputy Project Director for Near Detectors

ND SP  
PM  
Shared Tech Coord Support  
DUNE ND TC  
Components PMs  
Install PM  
Cryo Systems PM  
Infrastructure PM  
DUNE  
Consortia



**Stefan** completes his term  
as Co-Spokes –  
thanks+appreciation!  
Replaced by **Sergio  
Bertolucci**



**LBNF/DUNE-US Deputy Project Director – Ron Ray**  
Leader of Mu2e project since inception  
NOvA Deputy Project Manager through CD-2



**Deputy Project Director for Facilities – Mary Convery**  
Deputy Head/Associate Head of Accelerator Division 2015-2021  
Oversaw construction of Fermilab Muon Campus 2011-2019



**Deputy Project Director for Far Detectors – Marzio Nessi**  
Technical Coordinator for ATLAS construction and initial run  
Chair of CERN Neutrino Platform



**Deputy Project Director for Near Detectors – Sam Zeller**  
Co-spokesperson for MicroBooNE and Deputy of FNAL  
Neutrino Division  
Previous DUNE roles include LBL Physics Co-Convener, FD TDR  
Co-Editor, JPO Review Office



**LBNF/DUNE-US Project Manager – Kurt Vetter**  
US ITER Deputy Project Manager and Interim Project Manager  
Project Manager – LSST Science Raft; PM Photon Science  
Division, BNL

LBNF/DUNE



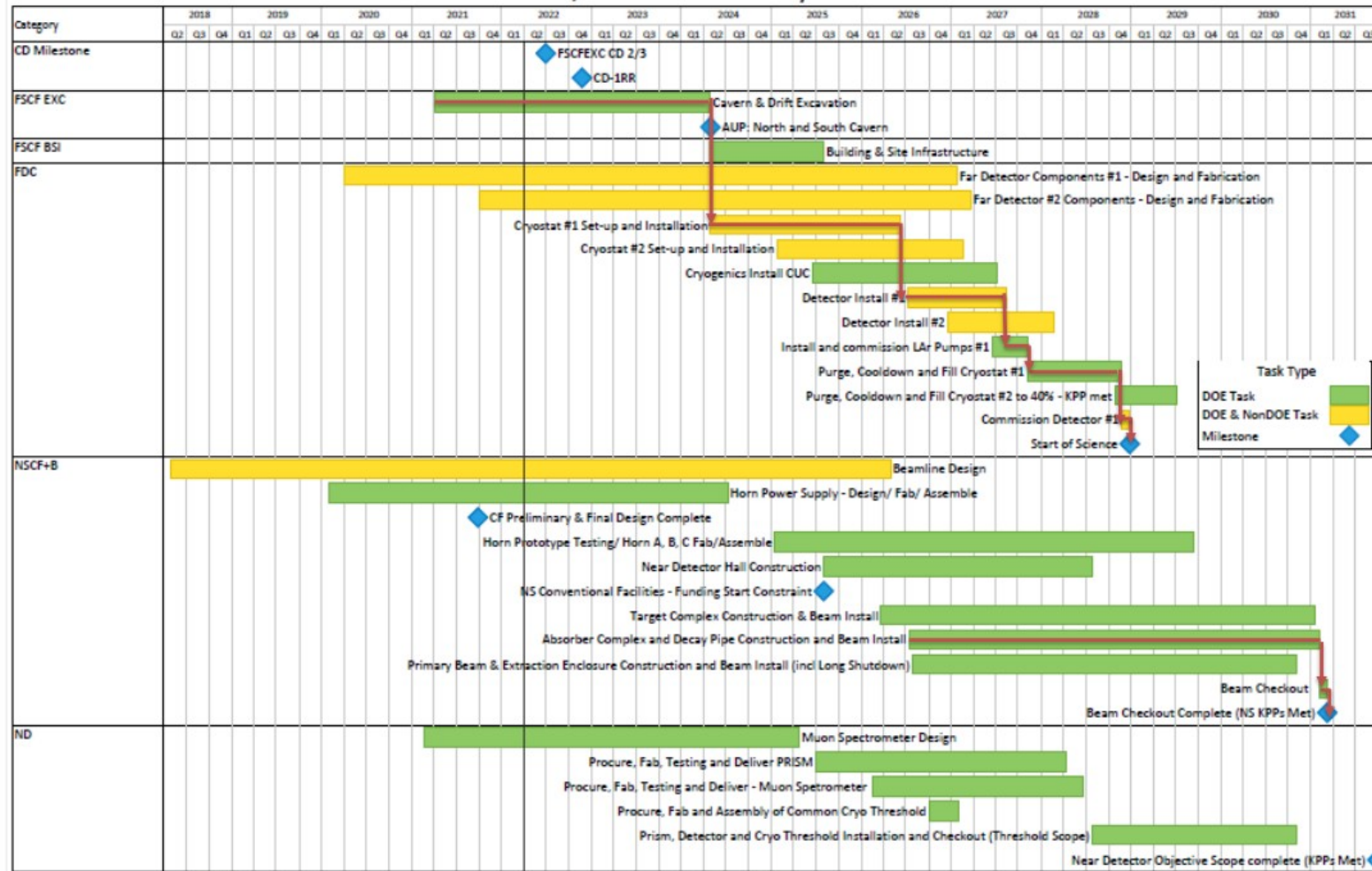
# LBNF/DUNE Sub-projects

	Subproj Abbrev	Subproject Title	Subproject Scope	Design Maturity	Proposed CD-2 IPR
FAR SITE	FSCF-EXC	Far Site Conventional Facilities - Excavation	All Far Site (FS) conventional facilities (CF) reliability, pre-excavation, and excavation including all detector caverns	100%	✓ Completed 12 Jan 2022
	FSCF-BSI	Far Site Conventional Facilities – Building & Site Infrastructure	All Far Site (FS) conventional facilities (CF) support infrastructure	100%	Scheduled 15 – 17 Nov 2022
	FDC	Far Detector 1, Far Detector 2 + Cryogenics	Far Detector 1 (FD1), Far Detector 2 (FD2), including integration/installation, and all cryogenic infrastructure (C) and LAr fluids.	83% (FD1) 71% (FD2) 63% (C)	Planned early 2023
NEAR SITE	NSCF+B	Near Site Conventional Facilities + Beamline	All Near Site (NS) conventional facilities (CF) including beamline facilities, detector cavern and support infrastructure; primary and neutrino beamline (B)	100% (CF) 65% (BL)	Planned late 2023
	ND	Near Detector	Near Detector (ND) including integration/installation and cryogenic systems	30%	TBD 2023 to 2025

LBNF/DUNE



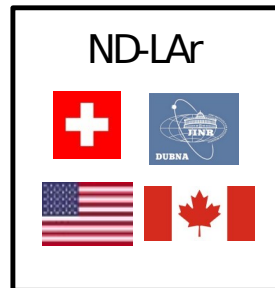
# International Schedule



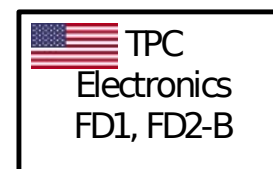
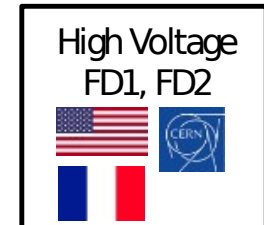
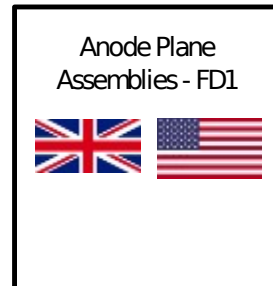
# LBNF/DUNE International Project

## DUNE Detector Construction Consortia

### Near Detectors

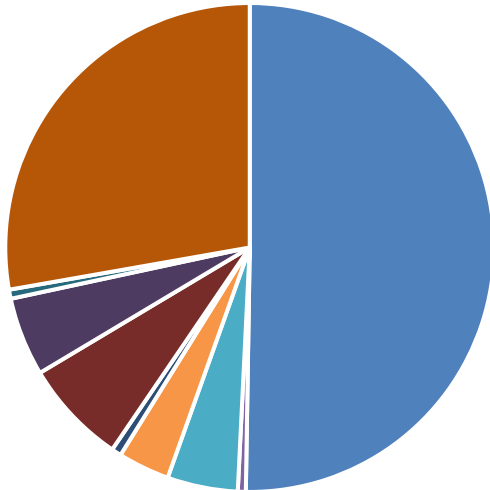


### Far Detectors

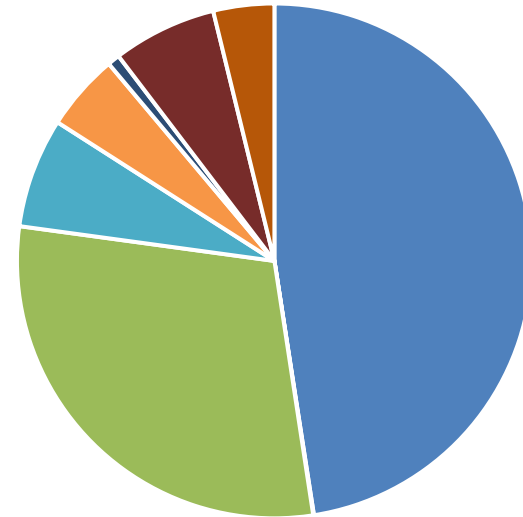


# Resources

FD1 - Direct M&amp;S



FD2 - Direct M&amp;S



■ DOE.CNSTR ■ In Kind ■ IN2P3 ■ Canada ■ CERN ■ CSIC  
 ■ CZECH ■ INFN ■ Latin America ■ Brazil ■ Non-DOE ■ UK

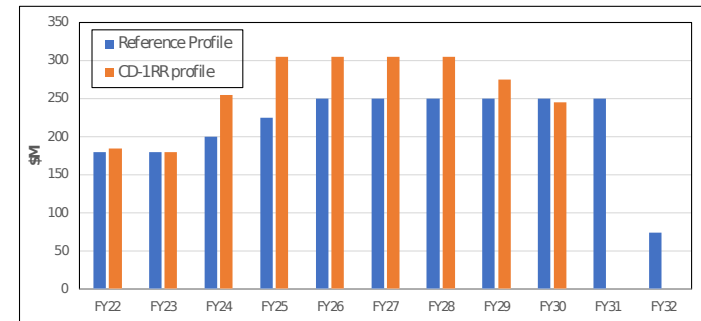
■ DOE.CNSTR ■ In Kind ■ IN2P3 ■ Canada ■ CERN ■ CSIC  
 ■ CZECH ■ INFN ■ Latin America ■ Brazil ■ Non-DOE ■ UK



# DOE Funding Profile

Following International Neutrino Council meeting(Feb) and Resources Review Board(March) where concern expressed by several International Funding Agencies, DOE has proposed changes:

- An accelerated funding profile



	Prior	FY22	FY23	FY24	FY25	FY26	FY27	FY28	FY29	FY30	FY31	FY32	Total
Reference Profile	772	180	180	200	225	250	250	250	250	250	250	74	3,131
CD-1RR Profile	772	184	180	255	305	305	305	305	275	245	0	0	3,131
Difference	0	4	0	55	80	55	55	55	25	-5	-250	-74	0

- A CD1-RR in July 2022, to prepare for the base-lining of the LBNF/DUNE major components





# LBNF/DUNE: Two Phases

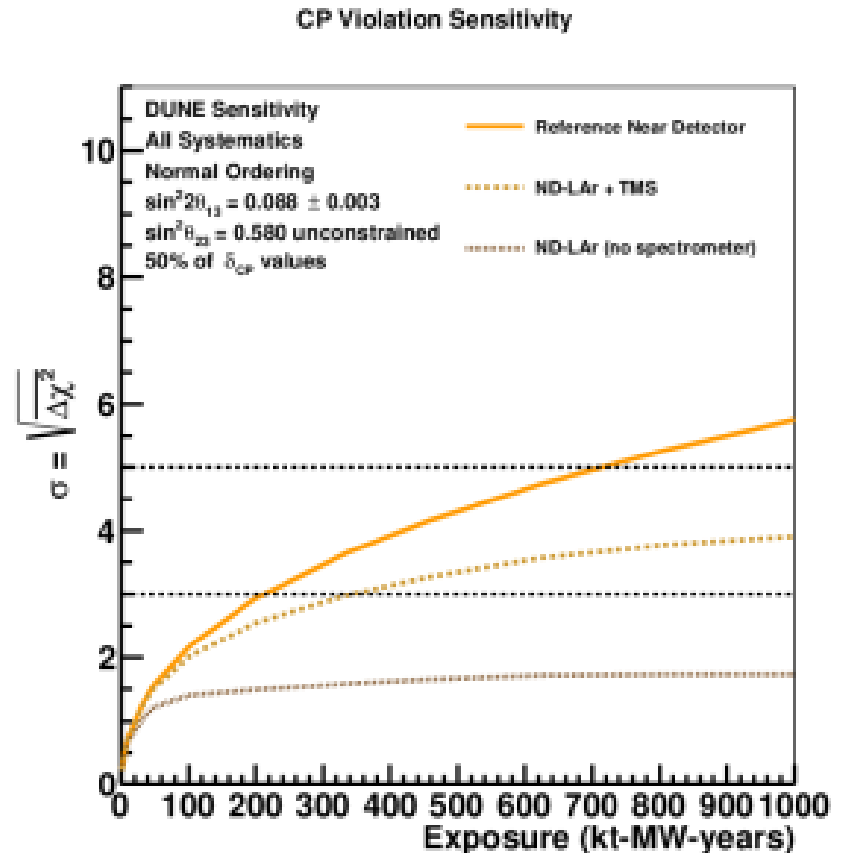
- DUNE Phase I (International Partners+LBNF/DUNE-US +PIP-II)
  - Two far detectors : 1 HD + 1 VD
  - Near detector = ND<sub>LAr</sub> + TMS + SAND + PRISM movement
  - 1.2 MW beam power
- DUNE Phase II
  - Additional mass at Far Detector (module 3 + 4)
  - A More Capable Near Detector (MCND) i.e. ND-GAr could replace TMS
  - Increased beam power (up to 2.4 MW) provided by Booster replacement





# Case for the Near Detector

- MCND needed to achieve final physics goals
- The Phase 1 ND is sufficient up to around 200 kt-MW-years at which point systematics start to dominate



# SNOWMASS

- “SNOWMASS” process identifies a strategy/vision for future PP research in USA.
- Feeds into “P5” process which advises DOE
- Was instrumental in formation of DUNE and continued support crucial for us to achieve full Phase 2 physics programme
- Concludes July 17<sup>th</sup>-26<sup>th</sup> in Seattle / P5 to report later this year
- Large effort inside DUNE to present the case for 4 FD modules, MCND and 2.4MW beam
- Hot topic: Phase II use of SURF caverns 3&4
  - Must deliver DUNE physics goals
  - Broader physics scope:  $0\nu 2\beta/\text{DM?}$
  - Improved technology?
  - Cheaper/more cost effective?
  - Next FD-3/FD-4 workshop to be held **Nov 2-4 in Valencia**

Community Summer Study  
**SNOWMASS**  
 2022 July 17 - 26 Seattle



The Snowmass studies lead by the Division of Particles and Fields (DPF) define the most important questions for the field of particle physics, and identify promising opportunities to address them in the coming decade. The community Summer Study (CSS) will lead to the final report from the ten frontiers. Join us in Seattle for the Snowmass Community Summer Study, exploring the biggest questions facing particle physics for the next decade.

**Program Committee**

**Steering group:**  
 DPF chair line: Joel Butler (CERN, FNAL), Tao Han (Pittsburgh), Sahar Chivukula (UCSD), Young-Kee Kim (Chicago), Priti Chakraborty (Minnesota)

**Divisional representatives:** Gennady Farrar (DAP, NYU), Yuri Kobayashi (BNP, UC Berkeley), Sergei Nazarenov (DPF, FNAL), Nicolas Yunes (DGRAV, UIUC)

**Frontier representations:**  
 Kateri Assamagan (Community Engagement, BNL), Paul Barbieri (Instrumentation, Duke), Nathaniel Craig (Theory, UCSB), Ben Nachman (Computing, LBNL), Meenakshi Narain (Energy, Brown), John Orrell (Underground Facilities, PNNL), Aleksey Petrov (Rare processes/ Precision, Wayne State), Vladimir Shilob (Accelerator, FNAL), Tim Tait (Cosmic, UC Irvine), Elizabeth Worcester (Neutrino Frontier, BNL)

**Early Career:** Gaurav Agarwal (Boulder), Jacob Zentgraf (FNAL)

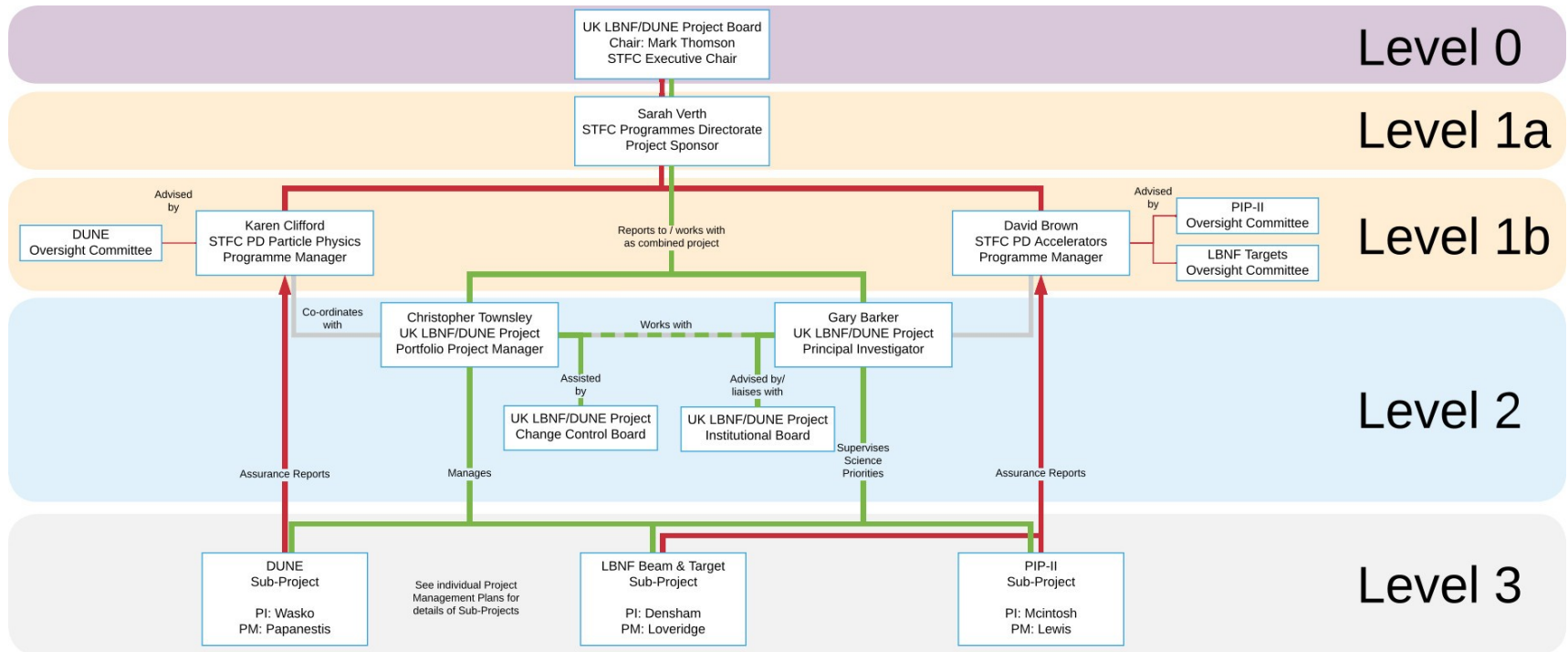
**Local Organization Committee**  
 Gordon Watts (Co-chair, UW), Shih-Chieh Hsu (Co-chair, UW), Quentin Baur (UW), Alejandro Garcia (UW), Anna Gonsior (UW), Laura Keating (UW), Joey Key (UW), Henry Lubatti (UW), Elise Novitski (UW), Greg Rybka (UW), Jan Strobe (PNNL), Lauren Tompkins (Stanford), Tien-tien Yu (UC)



<http://seattle.snowmass2022.org/>



# UK Project organisation



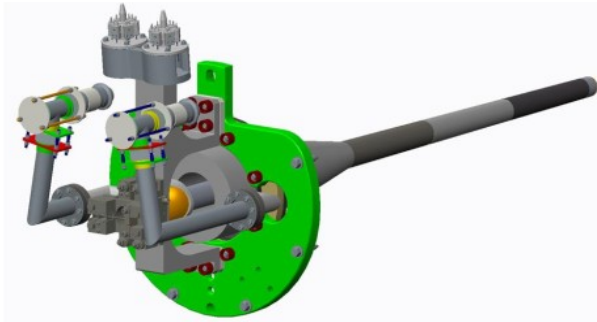
# News since last time...

- Our 2<sup>nd</sup> Gateway Review happened in January (Government-level scrutiny commissioned by BEIS): rated amber overall “Successful delivery feasible but significant issues exist requiring management attention.”
- Project Board in March: defined strategy for UK cavity capability
- Target approved for Phase 2 funding by PPRP (DUNE mid-project review to happen in October; PIP-II also this year, TBA)
- All sub-projects have been through OsC reviews
- Face-to-face DUNE collab. meeting in May with large UK presence (>30 UK project staff and students)
- MOU FD-1 prepared for UK APA/DAQ deliverables; MOU for FD-2 to almost ready; ND MOU to follow

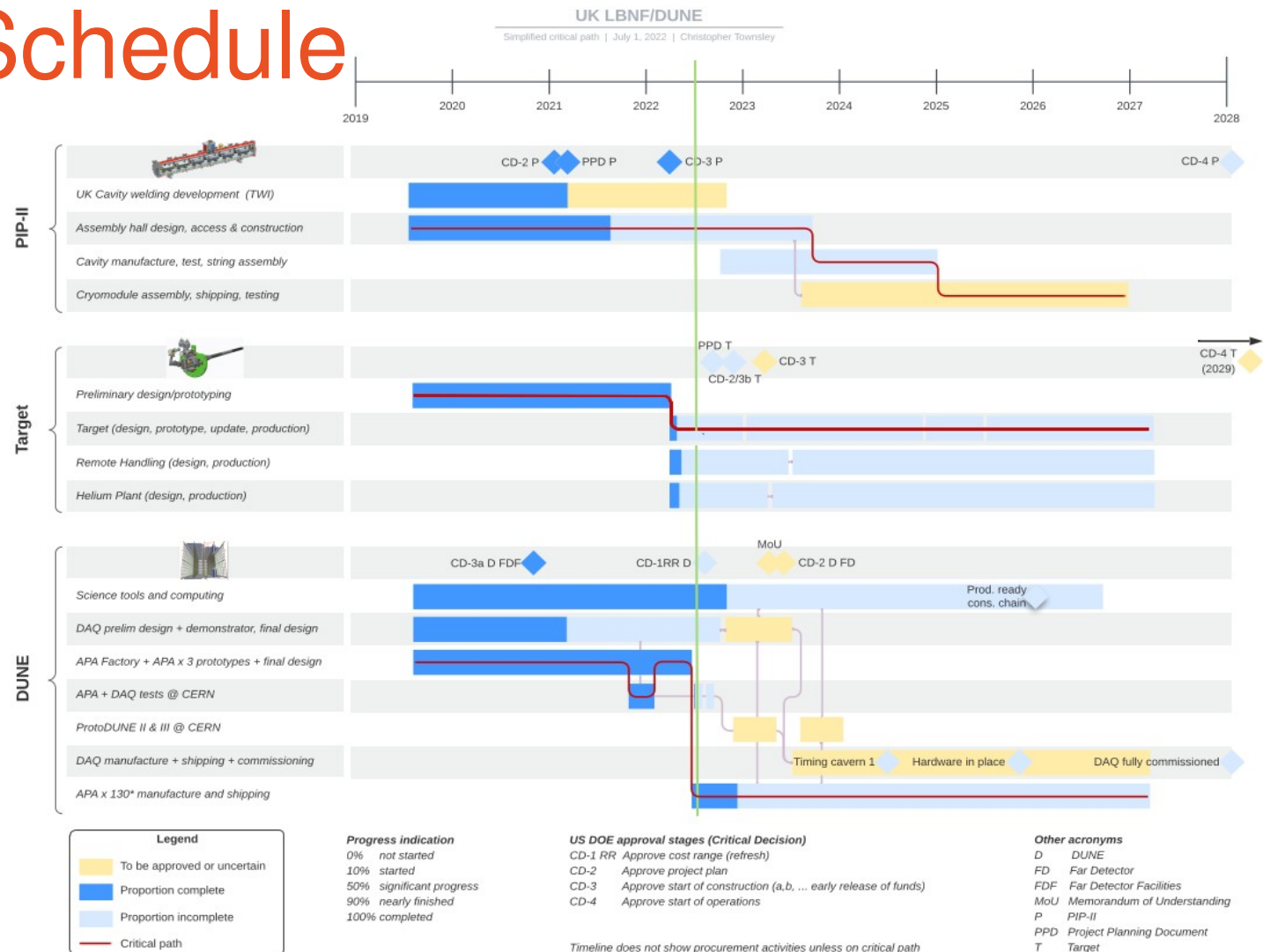


# Snippet from each project

- **Target** – PPRP has recommended full funding for Phase 2 (£4.8M/£6M, April'22 -March'27); includes significant new materials science studies
- **PIP-II**: cavity tender process just completed/ some progress in UK manufacturing capability/Niobium quality issue fixed
- **DUNE** – completed APAs for PDUNE-2; DAQ readout will be ethernet based; continued roll-out of Pandora recon. capability across HD/VD/ND



# UK Schedule



(Christopher Townsley)





# Finally..

- Reminder to always seek approval for travel from QMUL website: <https://pprc.qmul.ac.uk/app/travel/>  
... and to log actual cost of trip to project claimed

