CYGNO, 08 Feb 2024

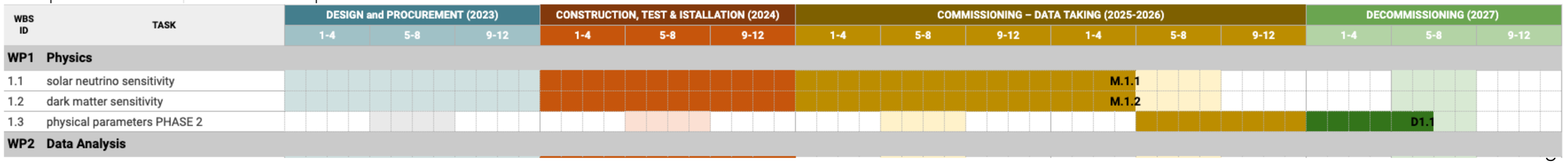
Meeting and WP organization

- In order to better organise and address all the items we need to follow, in the general meetings we are going to have short reports about the activities going on in the different Working Groups;
- The main structure with the current coordinators names can be taken from TDR
- The main tasks of each group was also indicated in the TDR
- I’m reporting in the next slide the current situation. Please have a look;

WP1 organization

Physics WP1	
Elisabetta Baracchini	
Task	**Coordinator**
Dark Matter	G. Dho
Solar Neutrinos	S. Torelli
Super Nova DM	E. Baracchini
Sensitivities and discovery potential	G. Dho
Migdal	A. Messina
LNGS Neutron Flux	F. di Giambattista

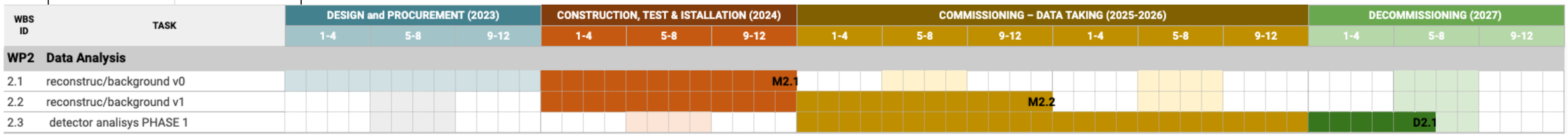
- WP1 Physics, WP leader Prof. E. Baracchini GSSI, is in charge of studying the discovery potential and application of the project. The expected deliverable by the end of PHASE 1 is to define the physics goals expected for dark matter search and neutrino astronomy for PHASE 2, based on the next physics scenario and the results achieved in PHASE 1. Two milestones are fixed before the final deliverable decisive for writing the PHASE 2 TDR:
  - evaluating the feasibility of solar neutrino measurement (M1.1)
  - evaluating the dark matter sensitivity expected (M1.2)
  - define the physical parameter space for PHASE 2 (D.1.1)



WP2 organization

Analysis WP2	
Giorgio Dho	
Task	**Coordinator**
Reconstruction Development	G. Dho
Online-Offline software integration	G. Mazzitelli
Data Analysis	G. Dho & D. Pinci
3D Reconstruction	D. Marques & D. Pinci
Infrastructures	G. Mazzitelli

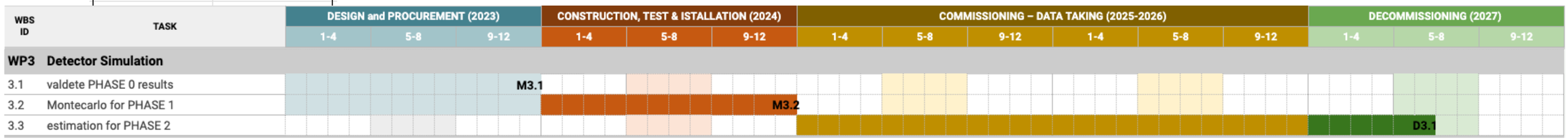
- WP2 Data Analysis, Dr. E. Di Marco INFN-ROMA1. The WP is in charge of developing reconstruction software and analyzing data. The WP will exploit the experience of LIME project and have to:
  - define process to achieve a 3D reconstruction of events and identify of NR and ER candidates to reject background v0 (M2.1)
  - define process to achieve a 3D reconstruction of events and identify of NR and ER candidates to reject background v1 multi camera (M2.2)
  - define procedure to analyze data and characterize the detector performance (D2.2)



WP3 organization

Simulation WP3	
Giulia d'Imperio (dep) Pietro Meloni	
Task	**Coordinator**
Prototypes with GEANT	G. d'Imperio
Nuclear interactions with SRIM	F. di Giambattista
Gas properties with Garfield	D. Pinci
Sensor performance	R. Nobrega
Integration	F. Petrucci
Infrastructures	G. Mazzitelli

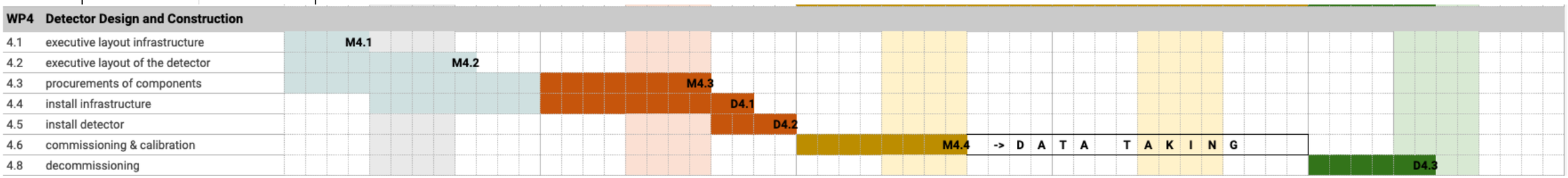
- WP3 Detector Simulation, Dr. G. D'Imperio INFN-ROMA1. The WP is in charge to develop fast and full simulation of the detector background and to evaluate systematics and uncertainty of detection resolution, efficiency, discrimination, directionality, ecc, ecc.. The WP can exploit the results of LIME detector by validating the simulation that should be fully scaled and applied to PHASE 2 expected results:
  - validate Montecarlo simulation from the PHASE 0 results (M3.1)
  - implement final Montecarlo for PHASE 1 based on the executive detector layout (M3.2)
  - elaborate the estimation for PHASE 2 (D3.1)



WP4 organization

Detector WP4	
Giovanni Mazzitelli	
Task	**Coordinator**
Design	S. Tomassini
Integration	G. Mazzitelli
CMOS sensor	R. Nobrega
GEM	L. Benussi
Performance Studies	D. Pinci
Light Sensors	F. Iacoangeli

- WP4 Detector Design and Construction, Dr. G. Mazzitelli INFN-LNF, the WP is in charge of the design, construction and implementation of the detector, the shielding and infrastructures. It is also in charge to coordinate installation and maintenance activities and to ensure the application of safety and environmental regulations. The WP is formed mainly by engineers, designers and experienced technicians. The Work Plan foreseen to cover the implementation of TDR chapter 6 to 9 the following milestone and deliverables
  - executive layout of the area and its infrastructure (M4.1)
  - executive layout of the detector (M4.2)
  - procurements of components (M4.3)
  - infrastructure installation (D4.1)
  - detector installation, gas system, electronics, computing, ecc. (D4.2)
  - commissioning and calibration (M4.4)
  - decommissioning (D4.3)



WP5 organization

Services WP5	
Andrea Messina	
Task	**Coordinator**
DAQ	A. Messina
Trigger	H. Lima
HV	F. Renga
Gas System and Slow Control	F. Renga
Gas Purification	R. Gregorio
Calibration	G. Cavoto
Storage and Networks	G. Mazzitelli

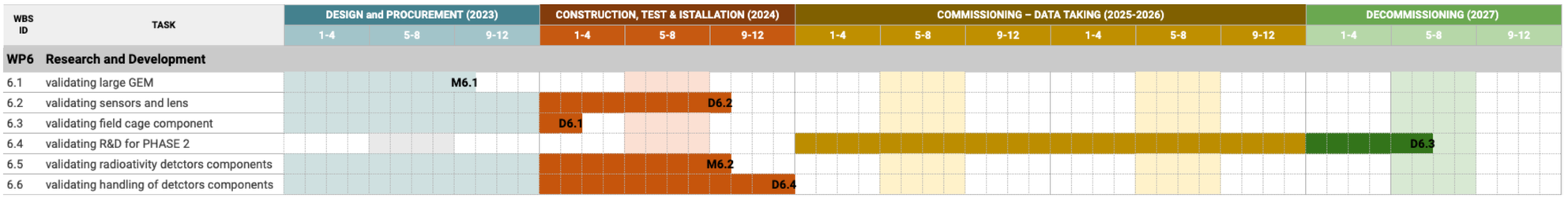
- WP5 Auxiliary Services, Dr. F. Renga INFN-ROMA1. The WP is in charge of all Axillary System (6.3-6.7): Gas System, HV and LV, DAQ and computing. All Hardware of those systems has been purchased for PHASE 0 and is under test at LNGS as well as the software needed to control equipment and acquire data.
  - validating gas system (included purification and recycle) (D5.1)
  - validating DAQ, slow controls and data quality monitor v0 (M5.2)
  - validating DAQ multi camera and data quality monitor v1 (D5.2)

WBS ID	TASK	DESIGN and PROCUREMENT (2023)			CONSTRUCTION, TEST & ISTALLATION (2024)			COMMISSIONING – DATA TAKING (2025-2026)						DECOMMISSIONING (2027)		
		1-4	5-8	9-12	1-4	5-8	9-12	1-4	5-8	9-12	1-4	5-8	9-12	1-4	5-8	9-12
WP5	**Auxiliary Services**															
5.1	validating gas system	D5.1														
5.2	validating DAQ v0			M5.1												
5.3	validating DAQ v1						D5.2									

WP6 organization

R&D WP6	
Davide Pinci	
Task	**Coordinator**
validating large GEM	L. Benussi
validating sensors and lens	D. Pinci
validating field cage component	G. Mazzitelli
validating cathode power distribution	G. Mazzitelli
validating R&D for PHASE 2	D. Pinci
Negative Ions	E. Baracchini
Materials radioactivity measurements	E. Kemp & D. Pinci
Gas Luminescence	D. Pinci
Alternative MPGD	E. Baracchini
Gas Mixture	C. Monteiro

- WP6 Research and Development , Dr. Davide Pinci INFN-ROMA1. The WP is in charge of the development ongoing for PHASE 1 (chapter 3) and the study needed to enhance the performance for PHASE 2 (chapter 4)
  - validating large GEM (M6.1)
  - validating low radioactivity field cage component (D6.1)
  - validating large sensors and low radioactivity lens (D6.2)
  - validating R&D for PHASE 2 (D6.3)



Working Groups

- Starting from this scheme, these tasks should probably be re-discussed, some was dropped, a lot are missing;
- A list of high priority tasks (probably not exhaustive) was prepared by Giovanni;
- Following the main indications of the TDR, we have to clearly indicate the tasks, the WP and be sure the all people is aware of them
- I invite every WP leader to have a look at them as a current starting point and propose:
  - New missing task
  - Obsolete tasks
  - Assignation and re-organization where needed.
    - Then we can discuss and “approve” in the next SC