

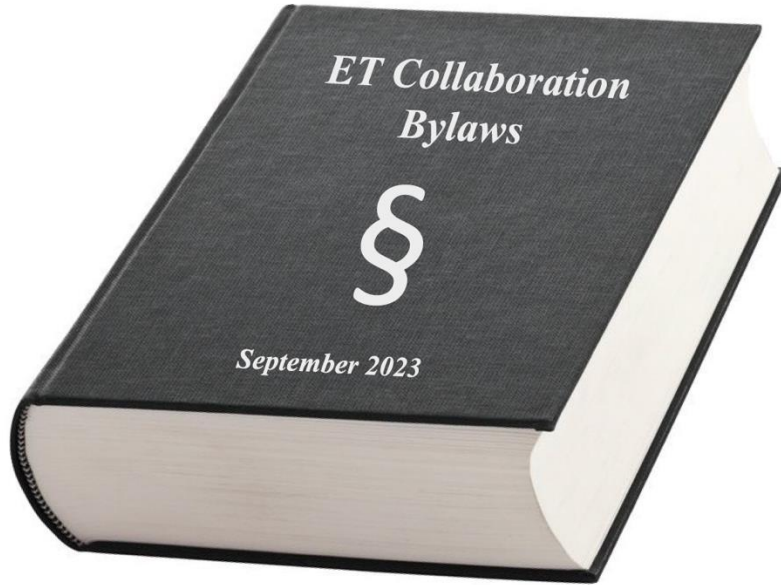
This page is dedicated to the ET Standards & Services Board (SSB) Project Program Committee (PPC).

The current Committee Chair is: **Ettore Majorana** (ET-Roma1).

**Ex-officio members**, to enhance implementation compliance

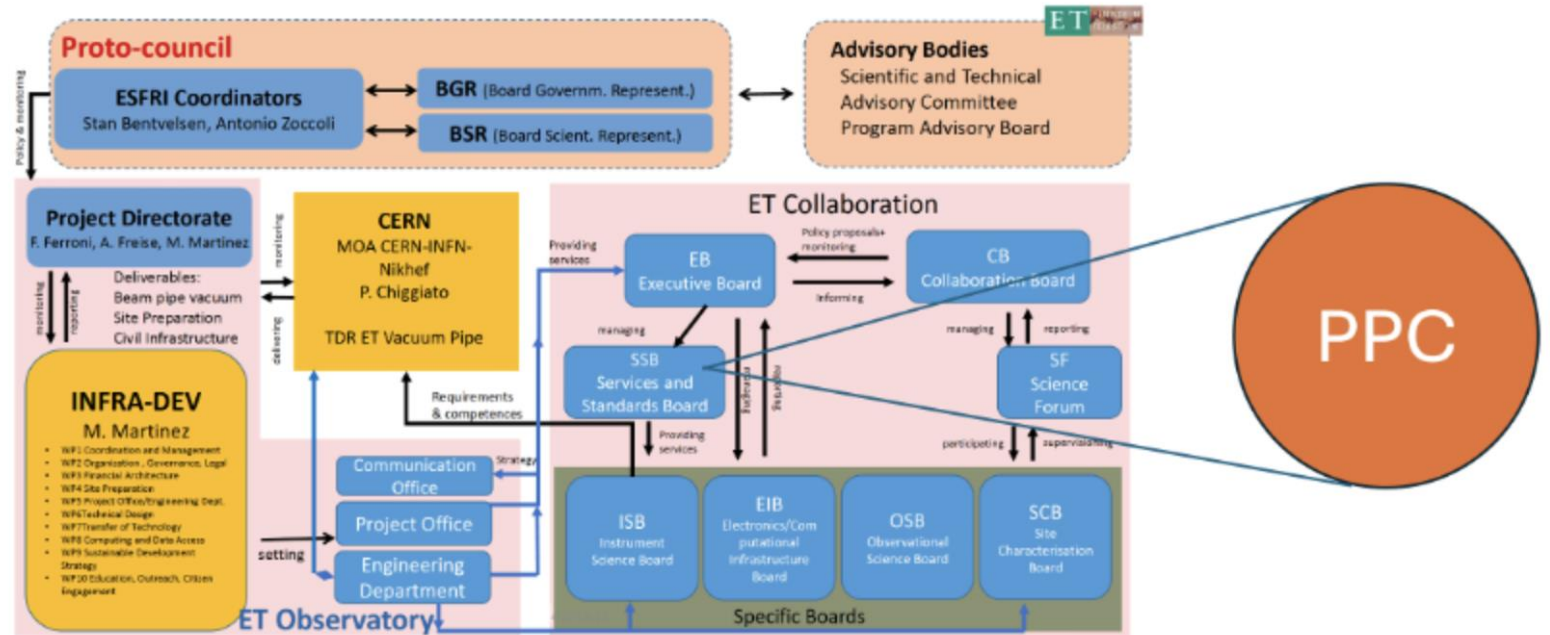
1. Gianpietro CAGNOLI (member)
2. Rosario De Rosa (vice chair)
3. Alberto GENNAI (member)
4. Katharina HENJES-KUNST (member)
5. Lluisa MIR (member)
6. Jerome NOVAK (member)
7. Takayuki TOMARU (member)

- E. Coccia/A. Freise (CB)
- M. Punturo/H.Lück (SP)
- ..... (ETO)
- S. Hild (ISB)
- S. Bagnasco (EIB)
- M. Branchesi (ex.officio, OSB)
- R. De Rosa (ex.officio, SPP)



PPC-restricted

## Overview



• **Main function 1)** The PPC is in charge for formulating and updating the program of ET (Bylaws Sept 2023) This program must be consistent with the ET CDR and with the TDRs to come and approved by Collaboration Board.

- The program must be consistent with ETO Directives
- The ET program is then used by the PPC to define the core tasks of the the ET Collaboration. The list of tasks must be pledged by the RUs/individuals.

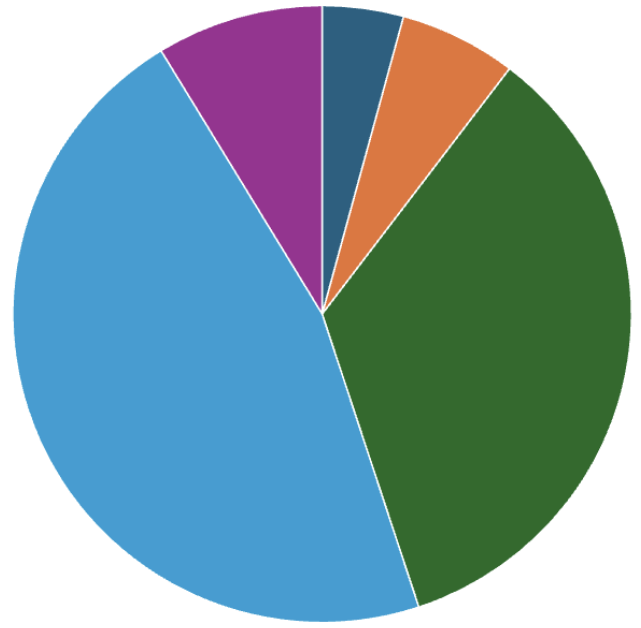
• **Main function 2)** The PC is in charge for negotiating the Collaboration Agreement Documents (CAD) with new member RUs and to annually crosscheck their performance (Bylaws Sept 2023) Standard review activity interval should be embedded in the CAD subscribed by RUs integrated in the timeline.

- PPC must facilitate/optimize as much as possible the collaboration efforts.
- In some cases, the reviews may be performed transversely, by grouping functional or integration aspects dealt by different RUs
- The definition of the review procedure will be one of the first tasks of PPC

❖ Some RUs are still close or below the threshold to ensure the agreements in the ETC

❖ <https://apps.et-gw.eu/etmd/?c=3>

- 1. ET-General FRTE TOTAL;
- 2. Number of RU members declared as ET-General;
- 3. RU (RFTE TOTAL)-(ET-General)



EIB	70
SPB	101
ISB	571
OSB	765
GENERAL	144
SSB	40
ET-PP	46
CB	59

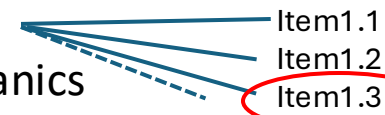
The Project Program is divided in **three Parts**. Each one involves one or more SBs

- I. The Science and Data Analysis
- II. The Hardware Implementation
- III. The Site

## Each **Part** is divided in specific **Sections**

1. Science cases
2. Science targets evaluation for the site selection and instrument optimization
3. Modelling and data analysis to extract scientific information from signals
4. Multi-Messenger and multi-band synergies
5. Evaluation of computational needs and requirements

1. Interferometer
2. Controlled mechanics
3. Electronics
4. Vacuum and Cryogenics
5. Underground Apparatus Infrastructure
6. Detector environment sensors

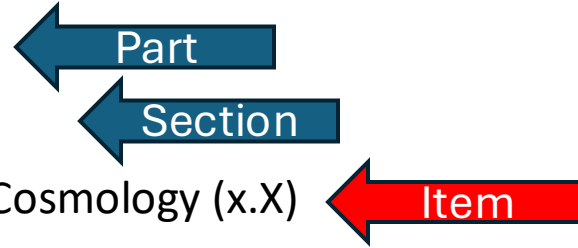


4 descriptors  
are associated  
to each item

1. Seismic Characterization
2. Electromagnetic Characterization
3. Air
4. Rock
5. Water

# RATIONALE FOR WRITING THE PP: ITEM OPERATIVE STATUS (IOS)

## I. The Science and Data Analysis



### 1. Science cases

#### 1.1 Fundamental Physics and Cosmology (x.X)

...

**Each chapter has the same structure**

## II. The Hardware Implementation

### 1 Interferometer

#### 1.1 The interferometer layout

## III. The Site

### 1 Seismic Characterization

#### 1.1 Surface and underground seismic noise

**The program is defined**

**by describing the** **ITEM OPERATIVE STATUS (IOS)**

**Rather intuitive to write for Parts II and III,  
but also suitable for Part I**

Example for 1.1, The interferometer layout

#### **II.1.1.A The basic layout**

**II.1.1.B Short-term R&D** (solution expected by 5y) e.g. once fixed today the layout, what is the tolerance to accommodate the possible evolutions matured through specific R&Ds ?)

**II.1.1.C Backup solutions** (in case of B failure, this is meant to be studied since the beginning !)

**II.1.1.D Medium and Long-term R&D** (solution expected by > 5y) e.g. NONE

### Each Part is divided in specific Sections

1. Science cases
2. Science targets evaluation for the site selection and instrument optimization
3. Modelling and data analysis to extract scientific information from signals
4. Multi-Messenger and multi-band synergies
5. Evaluation of computational needs and requirements

1. Interferometer
2. Controlled mechanics
3. Electronics
4. Vacuum and Cryogenics
5. Underground Apparatus Infrastructure
6. Detector environment sensors

Item1.1  
Item1.2  
Item1.3

4 descriptors  
are associated  
to each item

1. Seismic Characterization
2. Electromagnetic Characterization
3. Air
4. Rock
5. Water

The Project Program is divided in **three Parts**. Each one involves one or more SBs

- I. The Science and Data Analysis
- II. The Hardware Implementation
- III. The Site

- The criterion to edit the IOS adopted is simple. Each descriptor of IOS must be mentioned, and the four descriptors should not exceed 10 pages in total and a minimum 500 per descriptor
- Once the item structure is agreed we need to involve ETC collaborators to edit the IOS descriptors.

## Chapter 6

### Interferometer

(people from several divisions in ETDM)

#### 6.1 The Interferometer Layout

Provides the agreed document concerning the core optics.

#### 6.2 Core Optics

Optical Cavities and BS, Coatings (53+53)

#### 6.3 Injection System

Lasers, IMC, REFC, benches (1.5)

#### 6.4 Detection System

OMC, photodiodes special arrangements expected (1.5)

#### 6.5 Auxiliary QNR Systems

(33)

#### 6.6 TCS/RoC Sensing/RoC Actuation Systems

(??)

#### 6.7 Calibration Systems

(2)

#### 6.8 Scattered Light Mitigation

(18)

e.g.: ~106 members are providing a RFTE fraction (ETMD)

e.g.: just a few” members are providing a RFTE fraction (ETMD)

Remarks 7

## Chapter 7

### Controlled Mechanics

(76\_Susp, 19\_ANM may help)

#### 7.1 Seismic Isolation System Layout for the Core Optics

Provides the agreed document concerning the core optics Seismic isolation system.

#### 7.2 Core Optics Seismic Isolation System

Includes local and inertial control devices.

#### 7.3 Bench Seismic Isolation Systems

Includes local and inertial control devices.

#### 7.4 Room Temperature Payloads

Includes Local control devices.

#### 7.5 Cryogenic Payloads

Includes Local control devices.

#### 7.6 Digital Control Devices Meant for Suspended Mechanics

Remarks 8

## Chapter 8

# Electronics

### 8.1 Multipurpose

Support to interferometer sensing and control and mechanics.

### 8.2 Digital RT Connection

### 8.3 DAQ

### 8.4 Front-end Computing Facility

Remarks

## Chapter 9

# Vacuum and Cryogenics

### 9.1 Room Temperature Vacuum

### 9.2 Cryotrap for RT Vacuum

### 9.3 TM Cryostats and Cryotrap

### 9.4 Underground Vacuum Service

### 9.5 Frontend Data Storage Service and Distribution CRY- OVAC

Remarks



## Chapter 9

# Vacuum and Cryogenics

- 9.1 Room Temperature Vacuum
- 9.2 Cryotrap for RT Vacuum
- 9.3 TM Cryostats and Cryotrap
- 9.4 Underground Vacuum Service
- 9.5 Frontend Data Storage Service and Distribution CRYOVAC

Remarks 9

## Chapter 10

# Underground Apparatus Infrastructure

(Through direct interaction with ETO Infrastructure)

- 10.1 Cryogenics
- 10.2 HVAC
- 10.3 Clean Areas
- 10.4 Cranes
- 10.5 Fiber/Copper Network

Remarks 10

## Chapter 11

# Detector Environment Sensors

- 11.1 Seismometers/Tilt/Newtonian Noise Reconstruction
- 11.2 EM
  - Includes Schumann, active injection...
- 11.3 Air
  - Pressure/T/Humidity
- 11.4 Acoustic/LIDAR
  - Atmospheric NN.

Remarks 11

	A	B	C	D	E	F	G	H
RU		13.1 Surface and Underground Magnetic Noise	13.2 Impact of Local EM Noise Sources	Total engagement on PP Chapter				
1								
2	Total engagement on the	0		0				
3	<a href="#">APC/LAUM</a>							
4	<a href="#">Artemis</a>							
5	<a href="#">BelGrav UAntwerpen</a>							
6	<a href="#">BelGrav-Brussels</a>							
7	<a href="#">BelGrav-UGent</a>							
8	<a href="#">BelGrav-Wal</a>							
9	<a href="#">Berlin</a>							
10	<a href="#">BETS</a>							
11	<a href="#">BME</a>							
12	<a href="#">BoET</a>							
13	<a href="#">Center for Astrophysics and CIEMAT-FP</a>							
14	<a href="#">CosmoGrav SSM-Napoli</a>							
15	<a href="#">CSIC</a>							
16	<a href="#">DESY</a>							
17	<a href="#">Eberhard Karls University</a>							
18	<a href="#">EGO</a>							
19	...							
20	...							
21	...							

PART III structure OK

	A	B	C	D	E	F	G	H	I	J
RU		1.1 Fundamental Physis and Cosmology	1.2 Population Studies	1.3 Subatomic Physics, Stellar Collapse and Neutron Stars	Total engagement on PP					
1										
2	Total engagement on the	0	0	0	0					
3	<a href="#">APC/LAUM</a>									
4	<a href="#">Artemis</a>									
5	<a href="#">BelGrav UAntwerpen</a>									
6	<a href="#">BelGrav-Brussels</a>									
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15	<a href="#">CSIC</a>									
16	<a href="#">DESY</a>									
17	<a href="#">Eberhard Karls University</a>									
18	<a href="#">EGO</a>									
19	...									
20	...									

PART I structure requires some effort to group the contents of the inner Tier

	A	B	C	D	E	F	G	H	I	J
RU		6.1 The Interferometer Layout	6.2 Core Optics	6.3 Injection System	6.4 Detection System	6.5 Auxiliary QNR Systems	6.6 TCS/RoC Sensing/RoC Actuation Systems	6.7 Calibration Systems	6.8 Scattered Light Mitigation	Total engagement on PP
1										
2	Total engagement on the	0	0	0	0	0	0	0	0	0
3	<a href="#">APC/LAUM</a>									
4	<a href="#">Artemis</a>									
5	<a href="#">BelGrav UAntwerpen</a>									
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16	<a href="#">DESY</a>									
17	<a href="#">Eberhard Karls University</a>									
18	<a href="#">EGO</a>									
19	...									
20	...									

PART II structure requires a cross-check through ISB interaction