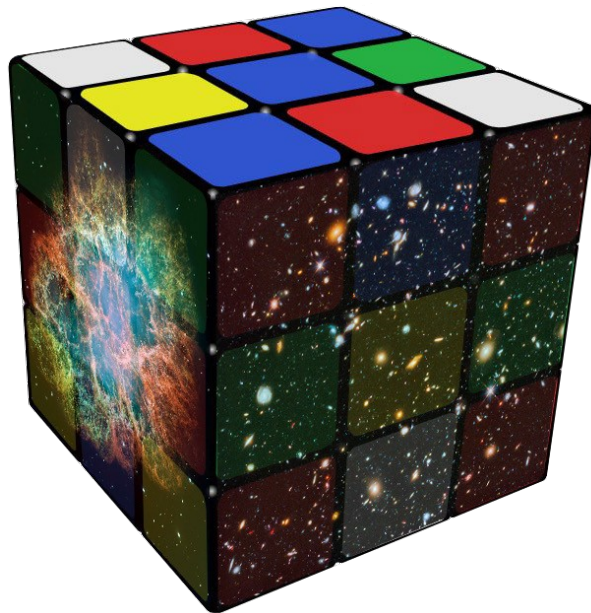




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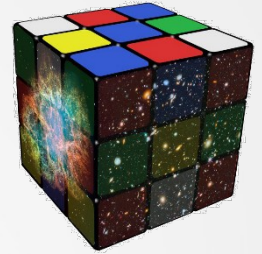


# *The CUBES Software Ecosystem*

Giorgio Calderone (SSE)  
INAF-OATs

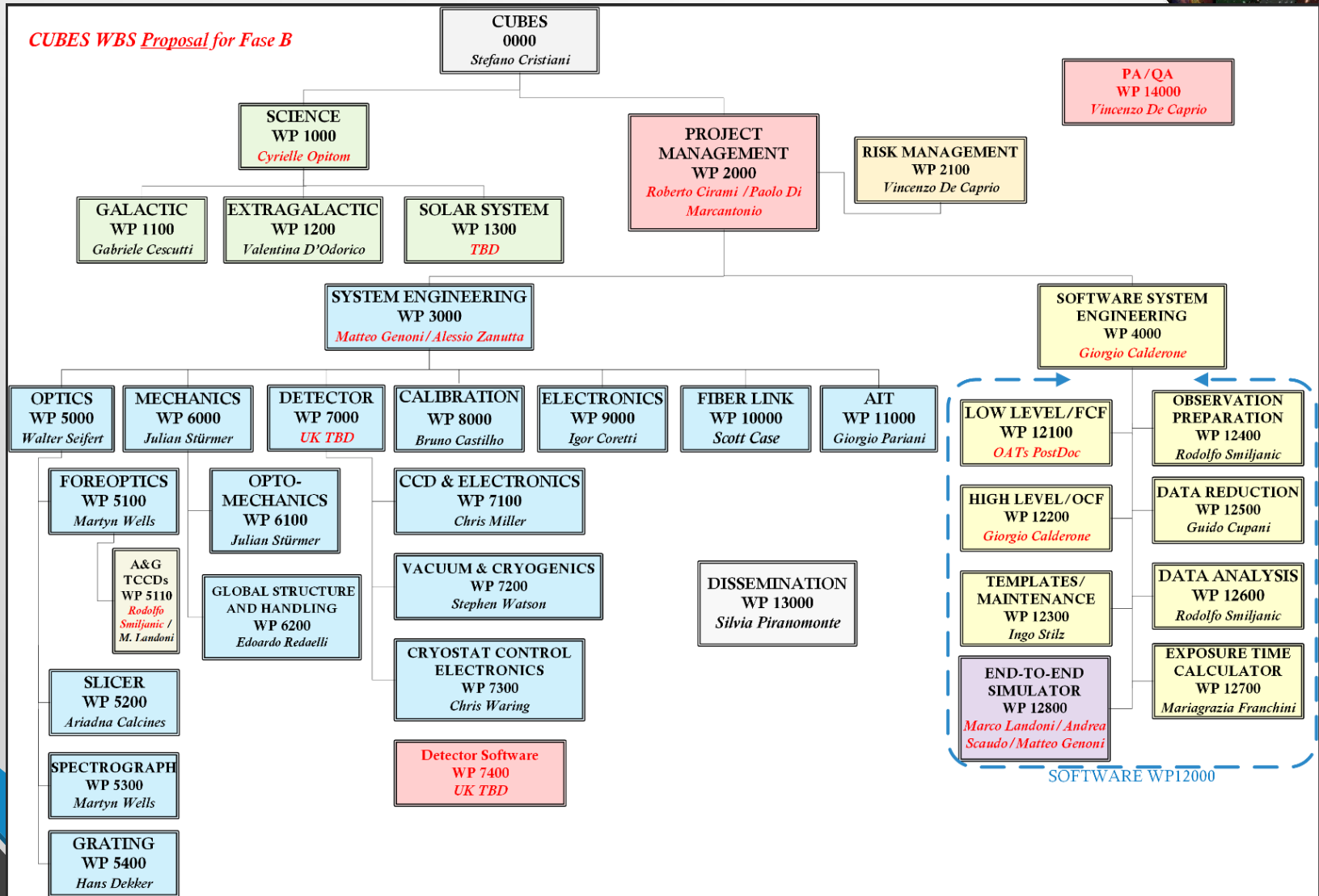
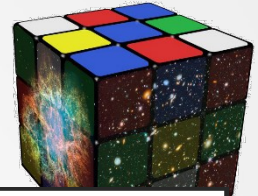
*CUBES Phase B KOM meeting*

# The SW ecosystem

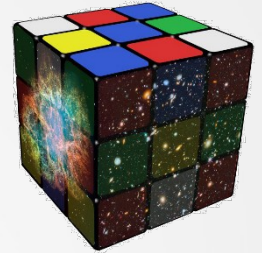


- Instrument control software:
  - Low-level (hardware control);
  - High-level (templates, observation coordination);
- Exposure Time Calculator;
- End-to-end simulator;
- Data reduction pipeline;
- Observation preparation;
- Data Analysis.

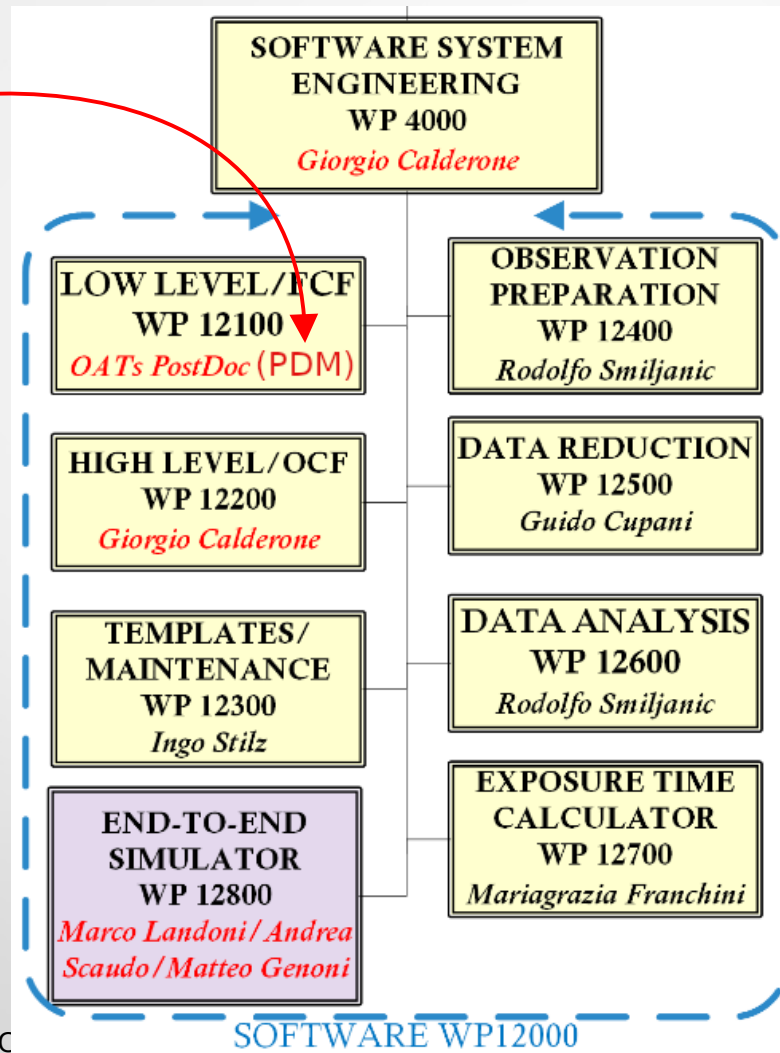
# Work packages



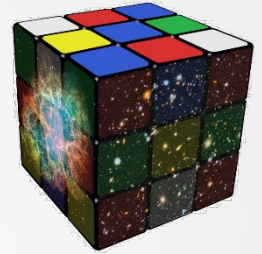
# Work packages



Paolo Di Marcantonio  
(ad interim)



# SPIE Abstract



**Symposium:** AS22 SPIE Astronomical Telescopes + Instrumentation

**Conference:** Ground-based and Airborne Instrumentation for Astronomy IX

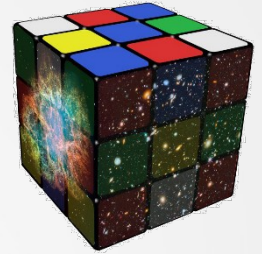
**Place/Date:** (Montreal, July 17-22)

**Due date:** Jun. 22th, 2022

## **CUBES and its software ecosystem: instrument simulation, control, and data processing.**

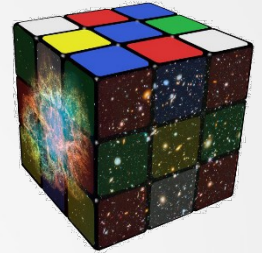
*CUBES (Cassegrain U-Band Efficient Spectrograph) is the recently approved high-efficiency VLT spectrograph aimed to observe the sky in the UV ground-based region (300-400 nm) with a high-resolution mode (~20K) and a low-resolution mode (~5K). In this paper we will briefly describe the requirements and the design of the several software packages involved in the project, namely the instrument control software, the exposure time calculator, the end-to-end simulator, and the data reduction software suite. We will discuss how the above mentioned blocks co-operate to build up a "software ecosystem" for the CUBES instrument, and to support the users from the proposal preparation to the science-grade data products.*

# Documents for Phase B



- **Delivery:** mid-October 2022;
- **E-ELT Instrument Control System Development Process Requirements (ESO-267497, v. 1, R-IDP-31):**
  - Instrument Software User Requirement Specifications;
  - Instrument Software Functional Specifications;
  - Instrument Software Management Plan;
- **Dataflow for ESO Observatories Deliverables Specifications (ESO-037611, v. 4, Tab. 1848):**
  - Instrument package (§4.2);
  - Data Reduction Library Specifications (§4.3);
  - Exposure Time Calculator Specifications (§4.8);
  - Observation Preparation Tool Specifications (if needed, §4.10);

# Phase B: commitments



	Italy	Germany	Poland	Brasil	Total
SSE	0.25	0	0	0	0.25
Control	0.25	0.3	0	0.3	0.85
OPS, DRS, DAS	0.2	0	0.3	0	0.5
ETC, E2E	0.6	0	0	0	0.6
					2.2
<b>Total</b>	<b>1.3</b>	<b>0.3</b>	<b>0.3</b>	<b>0.3</b>	<b>2.2</b>

## CUBES “Software” meeting:

Recurrent (14 days), starting from  
Feb. 3rd, 10.00 AM (CET)

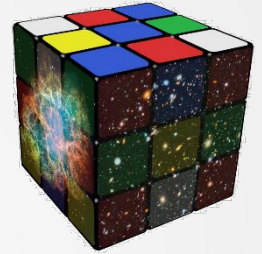
## Tools:

- Doc. concurrent editing: Overleaf, MS Teams;
- Doc repository: Owncloud;
- Management: OpenProject **(proposal)**.



# OpenProject

web-based project management system



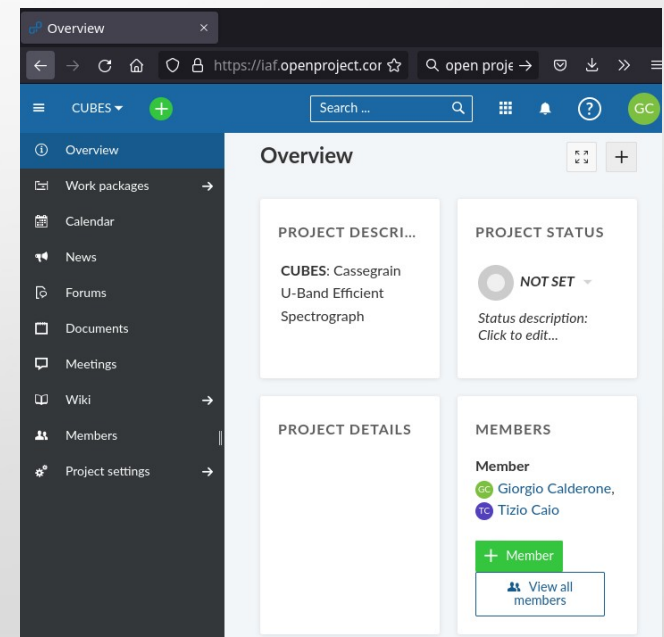
## Features:

- Ticketing;
- News (blog);
- Discussion forum;
- Document repository;
- Meeting list;
- Hierarchical wiki;
- Powerful search facilities;
- E-mail notifications.

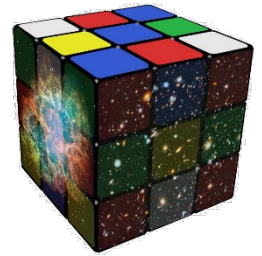
## Purpose:

- Dedicated tool for management, communication and knowledge gathering (no more search through emails);
- Track discussions and decisions;
- Maintain “live” and updated documents (e.g. schedules), collect material for ESO documents;
- Formalize knowledge transfer process (*“much knowledge in organizations is tacit or hard to articulate”*);
- **Reduce** individual efforts to find informations!

It is **open source** (with optional paid features and SaaS), and it has already been installed on our premises. **We will test it within the “CUBES software” group**, and possibly propose adoption for the whole project.







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Science & Technology Facilities Council  
UK Astronomy Technology Centre

