

# ELT/PCS R&D Roadmap - WP1: Science Cases & TLRs

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**Date:** 07/02/2025

**Venue:** PCS R&D roadmap WP1 telecon1

**Who:** see round table

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## Agenda:

1. Round-table
  2. PCS R&D roadmap
    - a. schedule & guidelines (recap from Jan 10th, 2025)
  3. WP1: Science cases & TLRs
    - a. Goals, deliverables & timeline
  4. Discussion about the WP1 working plan
    - a. proposed organization, WP1 schedule & next steps,
    - b. reference documents,
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## 1. Round table

Dino Mesa	Padova, direct imaging, SPHERE, SHARK-NIR
Raffaele Gratton	Padova, direct imaging, SPHERE, Col SPHERE+
Julia Seidel	ESO fellow/OCA, HRS
Matteo Brogi	Torino Univ, HRS,
Domenico Barbato	PD Padova, Radial Velocity,
Davide Fedele	Arcetri, proto. disks, observations, ERIS, MORFEO
Emannual Di Folco	LAB, protoplanetary disks
Olivier Demangeon	IAP Porto, indirect methods, transit, RV
Elisabetta	Padova, accretion, planet formation
Sebastiaan Haffert	Leiden, HCI, instrumentation
Damien Segransan	Geneva, direct imaging, astrometry, SPHERE(+)
Mary ann Limbach	Michigan, instrumentation (SCEXAO, GPI), variability
Logan Pierce	ELT fellow, direct imaging exoplanets
Martin Turbet	LDM/LAB, theory, modeling, atmospheres, ANDES
Veronica Roccatagliata	INAF/OAA, Debris disks, MORFEO
Valerio	Padova, CHEOPS, PLATO
Nuno Santos	Porto, Exoplanets, radial velocity, HRS
Simone Antonucci	Rome, exoplanets, accretion, SHARK-NIR, SPHERE
Oscar Carrion-Gonzalez	MPIA, Reflected light, Roman, METIS
Jens Kammerer	ESO fellow, direct imaging, interferometry, JWST
C. Lovis	Geneva, RV and direct imaging, RISTRETTO, ANDES
M. Bonnefoy	IPAG, observations, atmospheres, exoplanets, accretion
Lorenzo Pino	Arcetri, HRS,
Maud Langlois	CRAL, direct imaging, SPHERE, SPHERE+
Markus Kasper	ESO, EPIC, NEAR, PCS, instrumentation
B. Charnay	LIRA, Atmosphere, theory, modeling
S. Desidera	Padova, HCI, exoplanets, RV, PLATO SPHERE
A. Boccaletti	LIRA, exoplanets, disks, SPHERE, SPHERE+, MICADO
G. Chauvin	MPIA/OCA, exoplanets, SPHERE, SPHERE+, METIS

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**ACTION (WP1 coord., SDe, BCh, GCh):** create googlesheet that everyone can fill with first name, last name, email, expertise

## 2. PCS R&D roadmap - schedule & guidelines (recap from Jan 10th, 2025)

Slides (part 1):

<https://docs.google.com/presentation/d/1BfiKKfCsLidpB9Wz90MWdcfCjp2I1CCW/edit?usp=sharing&oid=112185395865364872771&rtpof=true&sd=true>

## 3. WP1: Science cases & TLRs

Slides (part 2):

<https://docs.google.com/presentation/d/1BfiKKfCsLidpB9Wz90MWdcfCjp2I1CCW/edit?usp=sharing&oid=112185395865364872771&rtpof=true&sd=true>

WP1 Schedule:

Tight schedule: PCS Science Cases & TLRs First Draft (**August 2025**)

Organization: monthly telecons with the following agenda for the next 6-months to be reviewed together

- **Feb, 6-7** Kickoff telecon #1 - Review PCS R&D guidelines, read/review **Ref. documents**, discuss agenda & next steps. **Proposal for science cases - deadline: March 7th, 2025 (Ref. GoogleSheet)**
- **mid-March** telecon #2 - **Science cases (primary/secondary) identification & Work organization incl. team/leads section assignment. Mid-March.**
- **mid-April:** telecon #3 - Science cases (primary/secondary) writing - Status update. Week of 7-11/4, general PCS R&D meeting schedule
- **mid-May:** telecon #4 - Status update. **Submission of science cases & TLRs sections - deadline: June 13th, 2025**
- **mid-June:** WP1 monthly telecon #5 - Review of first draft & comments,
- **mid-July:** WP1 monthly telecon #6 - Correction & updated draft
- **July 25th, 2025: Final draft release**

### Reference documents:

[https://docs.google.com/document/d/1\\_8nq3dIGqWFhtDI0lpLMsFQpP1SBks13MBoc7p21HTM/edit?usp=sharing](https://docs.google.com/document/d/1_8nq3dIGqWFhtDI0lpLMsFQpP1SBks13MBoc7p21HTM/edit?usp=sharing)

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## Reference Google sheet:

<https://docs.google.com/spreadsheets/d/1b-H7XLBwBdfLeBg4BfjdpzyiDPxhhBLFADFvmoYpRyQ/edit?usp=sharing>

## ACTIONS (ALL):

- ALL: fill the Reference documents with any relevant documents for the group and to revisit the science cases and TLRs of PCS
- ALL: propose science cases on the Google Sheet; deadline for March 7th, 2025.

## 4. Discussion about the WP1 working plan

ODe: ok with the plan, but we should focus more on exoplanets and disks? Not solar systems, stellar physics and Xgal?

MKa: Yes, we should focus on Disk and Exoplanets,

BCh: Highlight science case that will not be done by the other instrument at ELT.

RGr: useful to have a repository with some tools, list of possible targets, results from spectroscopy,

MKa: Onedrive, integrate into Teams tools, each Teams can go to the document, space available: 1Tb (fully sufficient),

**ACTION (WP1 coord., SDe, BCh, GCh):** migrate to Onedrive & Teams

Sebastian: separate the current requirements (wavelengths, bandwidths, spectral reso...) & provide a Minimum requirement and a goal.

**ACTION (WP1 coord., SDe, BCh, GCh):** update google sheet accordingly

CLo: some tension to develop a full sketch of science cases; urgency comes from the need to define some of the requirements; not sure that we will have the time, better to focus on key science cases and associated requirements?

. GCh: Document released in August as a first draft and will evolve over the 3 years. First requirements will be updated with the simulations. But, should indeed focus on top level requirements, most stringents requirements.

SHa: Performances of the instrument are already known as the DM is defined (128x128 actuators)?

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GCh: Still need to go through the E2E simulations, check the final contrast including coronagraphs, HDS concepts, data processing...

MKa: Many more things to consider in add. To DM (Corono, WFC part, bandwidths, throughput). Choice also to be done for spectral resolution, bandwidths, can you reach it or not,

MLa: will probably start with some analytical description before full end-to-end simulations.

RGr: Define new science cases but be realistic, for instance also some limitations related to the detectors.

SDe: Additions aspect to consider: Science cases, consider how we can arrive to this in terms of targets. Characterization of other targets. Need discovery phases. Not to idealize too much. Planets of given properties.

Next telecon: mid march, probably March 14th, 3pm CET.

## 4. List of actions

#	description	resp.	deadline
1	<b>WP1-team:</b> Create a WP1-team Google Sheet that everyone can fill with first name, last name, email, expertise	GCh, SDe, BCh	22/02/2025
2	<b>WP1-team:</b> Fill google sheet with your information	ALL	14/03/2025
3	<b>Sc. Cases - Ref. documents:</b> Fill the documents with relevant links/documents for the team	ALL	22/02/2025
4	<b>Sc. Cases:</b> Update Google Sheet to detail the requirements, add minimum req. And goal	GCh, SDe, BCh	22/02/2025
5	<b>Sc. Cases:</b> fill the sheet with your favorite science cases	ALL	07/03/2025
6	<b>WP1-docs:</b> migrate to Onedrive & Teams	GCh, SDe, BCh	14/03/2025