



Progress Meeting 5

May, 7, 2021

Agenda

- Status Hirings (AML)
- Status CDC (WP1; DAI, PDe, SBe, ACh)
 - Demo CDC (ACh)
- Status ERIS (WP2; AML)
- AOB
- Actions
- A PCA-based version of RDI and ADI (WP5, Y. Bai)

Next meetings

June 5 (inc. presentation Olivier F., WP1); July, 2 (inc. presentation Pierre K, WP2)

Hirings

- PhD

- PhD1 : UMR8109-SYLDES-024 ("Recherche de planètes extrasolaires en imagerie directe (H/F)" 31 candidates; Antoine Chomez selected.
- PHD2 : UMR8109-SYLDES-027 "Couplage de la spectroscopie et de l'imagerie à haut contraste pour la détection et la caractérisation des exoplanètes (H/F)" 41 candidates ; Hanae Belaouchi selected
- PHD3 : UMR8109-SYLDES-025 "Recherche de disques circumstellaires en imagerie directe (H/F)" 29 (16+13) candidates; Sophia Stasevic selected.
- PHD4 : UMR8109-SYLDES-026 "Évolution thermique et structure interne des exoplanètes : Des planètes géantes aux mini-Neptunes (H/F)" 21 candidates; Christian Wilkinson selected.

- Aspects adm.

ERIS+ document ESO

Medium resolution high contrast imaging with ERIS

Prepared by: A.M. Lagrange, A. Boccaletti, A. Carlotti, B. Charnay, C. Dougados, L. Jocou, J. Milli, M. Bonnefoy, G. Chauvin, E. Stadler, S. Rochat.

Over the last years, AO-fed coronagraphy coupled with near-IR IFU has proven to be one of the most promising techniques to detect exoplanets and reveal their molecular content. At ESO, SINFONI provided a AO-fed near-IR IFU until 2019, although with limited applications for exoplanetary science, as it lacked a high contrast imaging device. The forthcoming ERIS/SPIFFIER instrument will provide an AO-fed IFU facility, with similar instrumental set-ups as SINFONI, and improved performances. However, it will have the same major limitations for exoplanetary science. **We propose a modest, yet game changing upgrade to the ERIS/SPIFFIER instrument to allow high contrast pupil stabilized IFU observations at spectral resolutions 4000-8000 on the VLT. This instrumental upgrade (hereafter called ERIS+) will, to our knowledge, offer the only possibility in the next 5 years to combine medium resolution IFS, coronagraphy and high-order AO imaging for planet detection and characterisation at ESO. Exoplanets as close as 0.2-0.3'' will be searched for. ERIS+ will be very complementary to JWST (R up to ~3500 over 0.6-28.8 μm) which will characterise the atmospheres of close GP, or GP at separations $> \sim 1''$.**

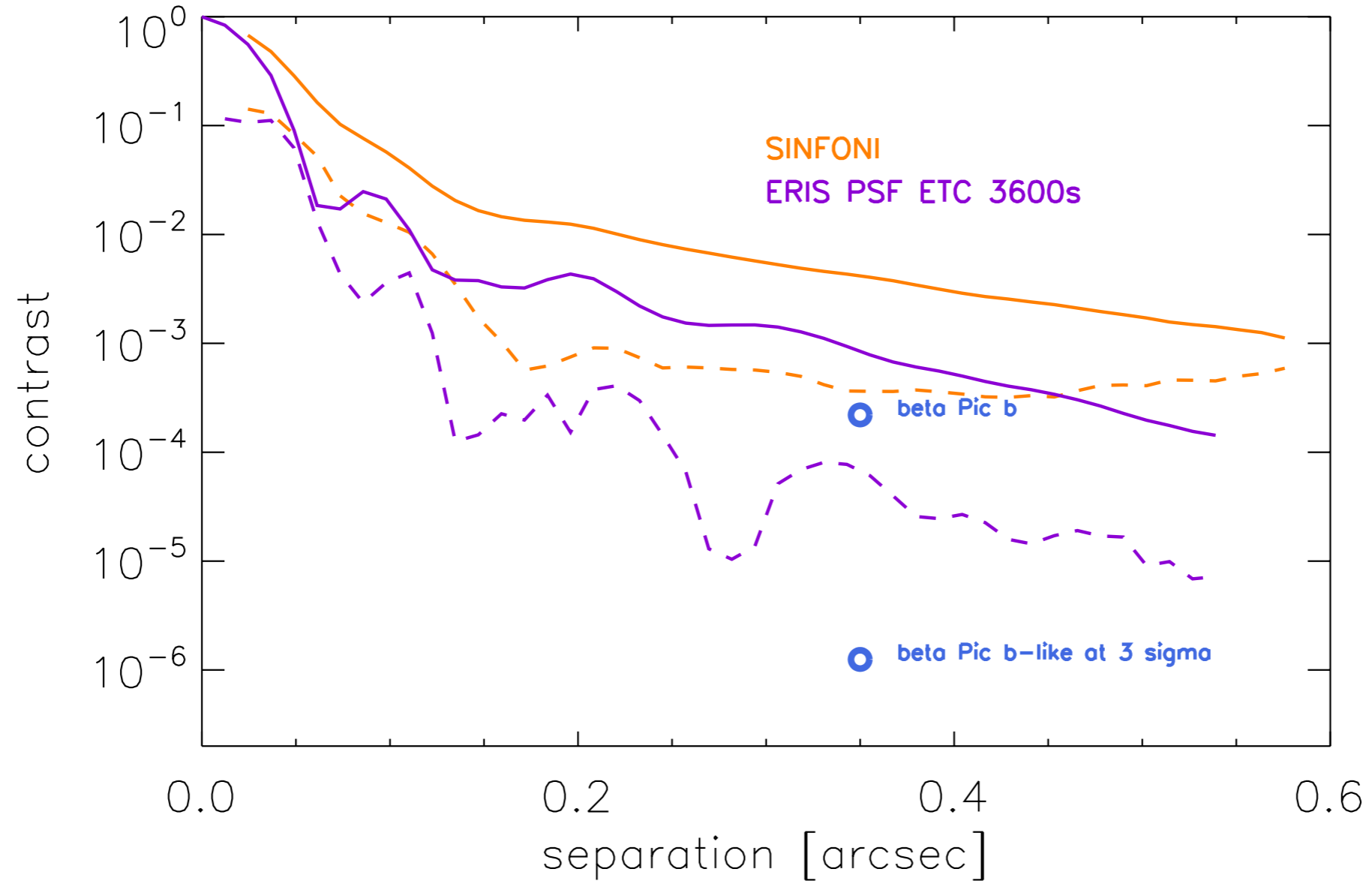
Importantly for the future, ERIS+ will be a unique test bench for the ELT/HARMONI high contrast mode, currently developed at IPAG, and, later, for the PCS instrument on the ELT. Both ERIS+ and ELT/HARMONI will allow molecule mapping, a novel technique that boosts detection capabilities and allows exoplanets atmosphere characterisation thanks to correlation with molecular lines.

The project will be funded by the ERC COBREX which started on 1/10/2020.

ERIS+ document ESO

- Main science cases:
 - Planets : detection and characterisation
 - An optimal (no blind zones) search for planets in the circumstellar environment of young, close bright ($K < 9.5$) stars
 - Disentangle planets from blobs
 - The first detailed characterisation of the chemical composition and physical properties of the atmospheres of any detected planets
 - Estimate the planet's orbital and rotational velocities.
 - Explore diagnostics of accretion on young giant planets
 - Disks : ices and jets in proto-planetary disks
- Performances estimates and comparison to SINFONI/SPHERE performances
- Targets
- Comparison to other current and forthcoming ground/space spectroscopic and imaging facilities
 - GRAVITY
 - JWST
 - SPHERE+
 - SPACES
 - Test bench for SPHERE-MEDRES and ELT/HARMONI
- Open questions (April 2021):
 - Final numbers of masks
 - Estimate of performances

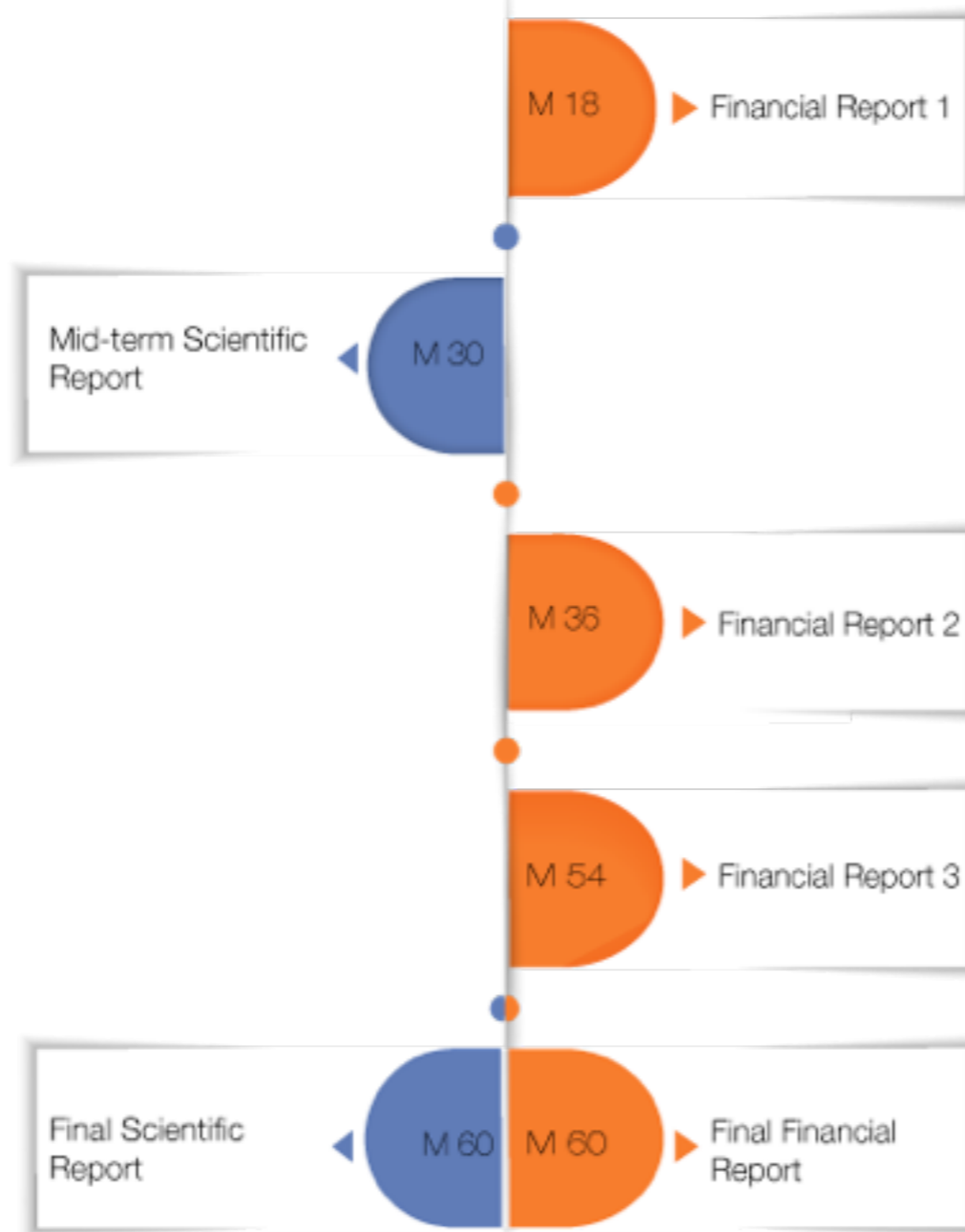
ERIS+ document ESO



Status of actions list April, 2nd

Actions (05/03/2021)	WP	Responsible	Initial Deadline	Deadline	Comments	Status
ERIS+ proposal ESO	0, 2	AML,GCh,MBo	Jan, 30	May, 7th		
Contacteur C Morda @ modélisation suite thèse de Linder	4.3	BCh/AML	March, 5	May, 7th		close
Converge on SW 1.2 strategy : which add tool	1.2	AML, MLa, PDe, ABo, GCh	March, 5	July, 3rd	delays in blind tests; specal, trap, paco, andromeda. roadmap in mid june.ADI A n d r o m e d a implemented (and IFS channel by channel), fnmf time consuming). trap not implemented.	
Check accès serveurs encadrants de thèse	0+a ll	MBo,ABo,	March, 31	May, 7th	For IPAG and LESIA	close
Schedule auditions PhD123	0	AML	Feb, 20	April, 4		close
Mail aux shortlistés (PhD123)	0	AML	12/03/21	April, 4		close
Générer des PSF simulées pour ERIS	2	ABo	asap	asap		close
Converger sur le nombre de masques ERIS+	2	AML,ABo	May, 7	May, 7		pending
Give calendar of reports to Damien	2	AML	May, 7	May, 7		close

Start of the project



End of the project

Any report needs to be submitted within 60 days of the end of the respecting reporting period

Actions list May, 7

Actions (05/03/2021)	WP	Responsible	Initial Deadline	Deadline	Comments	Status
ERIS+ proposal ESO	0, 2	AML,GCh,MBo	Jan, 30	May, 7th		
Converge on SW 1.2 strategy : which add tool	1.2	AML, MLa, PDe, ABo, GCh	March, 5	May, 7th		
Converger sur le nombre de masques ERIS+	2	AML,ABo	May, 7	May, 7		

tph poste ceyzerieu