SUPERFLAT

PCP Phase 1 - Contractor details & project abstracts

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As announced in the contract award notice 2022/S096-266185 for Research and development services and related consultancy services (published 18 May 2022), three contracts were placed for the Phase 1 of the Superflat PCP:

Contract 1

Contractor Details	Type/ size of legal entity	Place of performance of contract activities	Logo
Main contractor **Thales SESO SAS** 530 rue Frédéric Joliot 13290 Aix-en-Provence, France Dr. Luca PEVERINI Phone: +33 7 85 90 69 02 E-mail: luca.peverini@thalesgroup.com	Larger company	% of contract value allocated to main contractor: [100] % % of activities for the contract performed by the main contractor in EU Member States or countries associated with Horizon 2020: [100] %	THALES
Other consortium member(s) (if applicable) None			
Subcontractors (if applicable) None			

Project abstract *(+/- 1000 characters maximum)*

A number of high precision mirrors have been realized in recent years with specifications near 100 nano-radian slope errors and metrology data have been already validated by customers characterization at this level of precision. A detailed analysis of this mirror selection is proposed by inspection of metrology data recorded through each polishing sequence. The work will result in a new way to conceive the best polishing recipe and based on an innovative approach. The convergence with different initial pre-polishing conditions will be analysed by computer simulations and Dwell time calculations to verify the effectiveness of alternative polishing schemes and evaluating a new control scheme over the spatial frequency spectrum. The measurement of the instrument systematic errors and alternative statistical methods to reduce random noise will be checked on the data selected and obtained using the same metrology instruments.

Previous EU funding

Is the project based on / a continuation of R&D activities that were previously funded by the EU?: NO
If yes, identify this EU funding: [name EU funding programme] — [project name] — [grant number]

Contract 2:

Contractor Details	Type/ size of legal entity	Place of performance of contract activities	Logo
Main contractor **BERTIN WINLIGHT** 135, rue Benjamin Franklin ZA Saint Martin 84120 Pertuis France Julien MARQUE Phone: +33 (0)4 42 60 46 66 | E-mail: julien.marque@bertin.fr	Larger company	% of contract value allocated to main contractor: [100] % % of activities for the contract performed by the main contractor in EU Member States or countries associated with Horizon 2020: [100] %	
Other consortium member(s) (if applicable) None			
Subcontractors (if applicable) None			

Project abstract *(+/- 1000 characters maximum)*

Bertin Winlight has delivered over 600 X-ray mirrors to synchrotrons worldwide over the last 20 years. Providing mirrors with figure errors below 1nm PtV is a new difficult challenge that Bertin Winlight is happy to address. The phase 1 of this project will consist first in reviewing and better analysing the potential technologies that could respond to the needs in term of figure error, of course, but also in term of target roughness (<1Å rms) and in term of large size (>1m) and freeform capacity. We will justify the choice for a technology based on a localized chemical process.
This phase1 will also be the opportunity to prepare a complete development plan, covering phase 2 & 3, providing details on the way we will address the proof of concept, design, preparation of the testing/manufacturing equipment. Finally, we will provide during this phase the detailed design for setting up a test bench aiming at addressing the proof of concept milestone.

Previous EU funding

Is the project based on / a continuation of R&D activities that were previously funded by the EU?: NO
If yes, identify this EU funding: [name EU funding programme] — [project name] — [grant number]

Contract 3:

Contractor Details	Type/ size of legal entity	Place of performance of contract activities	Logo
Main contractor **SAFRAN REOSC** Avenue de la Tour Maury 91280 Saint Pierre-du-Perray France Ms Divya RADJOU Phone: +33 1 69 89 76 23 E-mail: divya.radjou@safrangroup.com	Larger company	% of contract value allocated to main contractor: [100] % % of activities for the contract performed by the main contractor in EU Member States or countries associated with Horizon 2020: [100] %	SAFRAN
Other consortium member(s) (if applicable) None			
Subcontractors (if applicable) None			

Project abstract *(+/- 1000 characters maximum)*

Safran Reosc has already developed polishing activities to produce optics close to the requirements of the customer. Safran Reosc has experience in polishing of Silicon optics acquired during various projects for different customers. Flat Silicon bars over a meter long were already made for the European Synchrotron Radiation Facility.
However, the level of precision required for these projects were not in the accuracy as requested by the Superflat project.
The aim of the project is to develop polishing technology that allows surface accuracy below 1 nm PTV MSE.
The main challenges are the performances of RMS slope errors in spatial frequencies lower than 0.1 mm^{-1}, below 20 nrad & from 0.1 mm^{-1} to 1 mm^{-1}, below 30 nrad as detailed specifications.

Additional challenges are to develop:

- Solutions to enable figure correction to a surface without increasing the roughness more than 10%.
- Solutions able to be extended to longer (up to 1 m) surfaces &/or non-flat figures.

Previous EU funding

Is the project based on / a continuation of R&D activities that were previously funded by the EU?: NO
If yes, identify this EU funding: [name EU funding programme] — [project name] — [grant number]