

# The Project

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# WEAVE



## The Project

### Objectives

The objective of this project is to deliver the WEAVE instrument, a new wide-field spectroscopy facility for the prime focus of the 4.2-m William Herschel Telescope. This project will comprise the delivery of a new two-degree field of view prime focus corrector, a 1000-multiplex fibre positioner and a dual-beam spectrograph. A small number of individually deployable integral field units and a large single integral field unit will also be available within the fibre positioner. Both the IFUs and the MOS fibres will feed the spectrograph that will provide full coverage of the majority of the visible spectrum. The project will include all deliverables necessary so that the ING may operate the instrument in fulfilment of the scientific objectives.

### Approach

A fundamental premise for the instrument construction is that development work will only be carried out when no other alternative exists for producing the constituent products, and such development work will be kept to the minimum required to deliver the project. Thus, where possible, the use of commercial-off-the-shelf products will be preferred. This has the advantage of reducing the project costs and allowing the project and the end product to benefit from tried-and-tested technologies that are often widely available. For specialised services and products, the project will endeavour to seek such items from within the technical capabilities of the consortium provided that this is a cost-effective and efficient solution. Likewise, the project will be managed entirely from within the consortium.

### Scope

The WEAVE Project will deliver the fibre-fed MOS instrument for the WHT consisting of the fibre positioner, the spectrograph, the instrument control software, the science data processing software and the data management and archiving system. The enhanced prime focus corrector will also be delivered as part of this project. It will also provide the observatory operational model required to support science data delivery following project closure.

## Exclusion

The project will not deliver the science, as this is out of scope of this particular project. Delivery of the science will be addressed in conjunction with the ING Board, the Project Board and the observatory.

## Structure

The project will be structured into a pre-project stage, followed by five managerial stages each with its own detailed plan. The pre-project stage will focus on starting up the project by assembling the Project Management Team, defining how the project will be approached, defining the project files and controls, initiating development of the WEAVE science cases and establishing an initial breakdown structure to assign work to the Project Team.

The project stages are shown below:

Stage	Description
1	Requirements capture and delivery specifications
2	Preliminary design followed by a preliminary design review
3	Final design followed by a final design review and procurement of long-lead time items
4	Manufacturing, assembly, integration and testing (MAIT)
5	Commissioning, operational handover and project closure

## Work Package Assignments and Status

The WEAVE project is divided into nine technical systems and these are driven by the high-level instrument architecture. There are also seven managerial systems driven by the project management plan. Each system is divided into a number of work packages and these work packages are assigned to an institution for delivery. The systems, the work packages, the responsible institutions and the status of each activity are shown below:

WP ID	System Name	Work Package	Institutions	Status
	<b>Two-degree Prime Focus System (PRI)</b>			
WP-01-01		Management of the prime focus corrector system	ING	On-going
WP-01-02		Prime Focus Corrector unit	ING, IAC	Stage 3
WP-01-03		Field rotator	ING, IAC	Stage 3
WP-01-04		Top-end support structure	ING, IAC	Stage 4
WP-01-05		Prime Focus Corrector Optics	NOVA (ASTRON), ING	Stage 4
	<b>Fibre Positioner System (POS)</b>			
WP-02-01		Management of fibre positioner system	Oxford	On-going
WP-02-02		Obsolete		
WP-02-03		Tumbler and fibre positioner	Oxford	Stage 4
WP-02-04		LIFU assembly	RUG, Oxford	Stage 4
WP-02-05		Obsolete: system change – now WP-01-03		
WP-02-06		A&G camera subsystem	ING	Stage 4
WP-02-07		Fibre positioner software	STFC-RAL	Stage 4
	<b>Fibre Systems (FIB)</b>			

WP-03-01		Management and delivery of the fibre system	GEPI	On-going
WP-03-02		MOS and non-science fibre subsystems	GEPI	Stage 4
WP-03-03		The LIFU fibre subsystem	RUG, GEPI	Stage 4
WP-03-04		The mIFU fibre subsystem	RUG, GEPI	Stage 4
	<b>Spectrograph System (SPE)</b>			
WP-04-01		Management of spectrograph system	NOVA (ASTRON)	On-going
WP-04-02		Spectrograph	NOVA (ASTRON)	Stage 4
WP-04-03		Spectrograph optics	STFC-RAL, NOVA (ASTRON), INAF, INAOE	Stage 4
WP-04-04		Science detectors	LJMU	Stage 4
	<b>Observatory Control System (OCS)</b>			
WP-05-01		Management of the observatory control system	ING	On-going
WP-05-02		Instrument control system	ING	Stage 3
WP-05-03		Observation queue scheduler	ING	Stage 3
WP-05-04		Engineering interface	ING	Stage 4
WP-05-05		Quick-look Module	Cambridge	Stage 3
WP-05-06		Data acquisition subsystems	ING	Stage 4
WP-05-07		Observation Blocks Manager	ING	Stage 3
WP-05-08		Modifications to the existing telescope control system	ING	Stage 3
WP-05-09		Prime focus corrector control system hardware	IAC	Stage 4
WP-05-10		Spectrograph control system hardware	IAC	Stage 4
WP-05-11		Prime focus corrector control system software	IAC	Stage 4
WP-05-12		Spectrograph control system software	INAF	Stage 4
WP-05-13		Obsolete : system change - Now WP-02-07		
WP-05-14		Field rotator control system hardware	IAC	Stage 3
WP-05-15		Field rotator control system software	IAC	Stage 3
WP-05-16		Observation sequencer	IAC	Stage 3
	<b>Core Processing System (CPS)</b>			
WP-06-01		Management of Core Processing System	Cambridge	On-going
WP-06-02		Quicklook data module	Cambridge	Stage 4
WP-06-03		L0 data module	Cambridge	Stage 4
WP-06-04		L1 data modules	Cambridge	Stage 4
	<b>WHT support facilities (WSF)</b>			

WP-07-01		Management of support facilities	ING	On-going
WP-07-02		Storage and handling equipment	ING, IAC, Oxford, NOVA (ASTRON), GEPI	Stage 4
WP-07-03		Focal plane calibration module	ING	Stage 3
WP-07-04		Modification of stand-alone test facility	ING	On-going
WP-07-05		Installation of cables	ING	On-going
WP-07-06		Supply of services	ING	On-going
WP-07-07		Telescope performance	ING	Completed
	<b>Advanced Processing System (APS)</b>			
WP-08-01		Management of Advanced Processing System	IAC	On-going
WP-08-02		Spectral Classification and Redshift Determination Module	IAC	Stage 4
WP-08-03		Stellar Analysis Module	IAC	Stage 4
WP-08-04		Galaxy Analysis Module	IAC	Stage 4
WP-08-05		APS IFU Analysis Module	IAC	Stage 4
	<b>WEAVE Archive System (WAS)</b>			
WP-09-01		Management of WEAVE Archive System	INAF	On-going
WP-09-02		Internal release archive subsystem	INAF	Stage 3
WP-09-03		Public release archive subsystem	INAF	Stage 3
	<b>Business Case</b>			
WP-20-01		Create and manage the WEAVE business case	ING	On-going
WP-20-02		Project Scientist Role	RUG	On-going
	<b>Project Management</b>			
WP-21-01		Project Management	ING	On-going
	<b>Controls</b>			
WP-22-01		Project Controls	Oxford, ING	On-going
	<b>End-user Documentation</b>			
WP-26-01		Engineering manuals	ING	On-going
WP-26-02		Operations and maintenance manuals	ING	On-going
WP-26-03		User manuals	ING	On-going
	<b>Project Office</b>			
WP-27-01		Project Support Office	ING	On-going
	<b>System Engineering Procedures</b>			
WP-28-01		Systems Engineering	STFC-RAL	On-going
WP-28-02		Obsolete		

WP-28-03		Instrument Scientist Role	ING	On-going
	<b>Health and Safety</b>			
WP-29-01		Manage WEAVE Health and Safety System	ING	On-going