Programme: Office for Director General (ODG)

Project/WP: Office of the Director General

ESO High Level Organisational Structure

Document Number: ESO-321528

Document Version: 4

Document Type: Plan (PLA)

Released On: 2025-04-22

Document Classification: Public

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Change Record from previous Version

Affected Section(s)	Changes / Reason / Remarks
all	Update to 2025 circumstances

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1. Introduction

1.1 ESO, an intergovernmental organisation

ESO, the European Organisation for Astronomical Research in the Southern Hemisphere, or, with a shorter version of the name, the European Southern Observatory, is an intergovernmental science and technology organisation in astronomy, established under international public law in 1962. ESO currently has 16 Member States[1]: Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Ireland, Italy, Netherlands, Poland, Portugal, Spain, Sweden, Switzerland, and the United Kingdom. Australia is a Strategic Partner of ESO. Chile is the host state of the ESO Observatories, while the ESO Headquarters are hosted by Germany.

The Member States exercise their general oversight role via the ESO Council[2], which is the governing body of ESO. The financial oversight is conducted via the Finance Committee[2], which reports to Council. Additionally, the Scientific Technical Committee[2] advises Council and the Director General[3] (DG) on technical and scientific matters.

1.2 ESO's mission

ESO's overall mission is: i) to design, build and operate advanced ground-based observatories and ii) to foster international collaboration for astronomy. ESO Council has approved in the last years also a formulation of the Vision, of the Values and of the Strategy for the 2020s, completing the full strategic formulation[4].

For the implementation of its strategy, ESO operates three unique world-class observing sites in the Atacama Desert of Chile: the La Silla Paranal Observatory (LPO), which includes the La Silla site with the 3.6m telescope and the NTT[5] and the Paranal site with the VLT/VLTI and VISTA[6], and a number of hosted telescope projects at both sites, and the ALMA Observatory[7] with the main telescope site located at the Chajnantor plateau, in an international partnership. The construction of the ELT[8] at the Armazones site near Paranal will add the largest ground-based optical/near-infrared telescope in the world. ESO will further host and operate the southern array of the CTAO which is being constructed in the valley between Paranal and Armazones.

[1] http://www.eso.org/public/about-eso/memberstates/
[2] http://www.eso.org/public/about-eso/committees.html
[3] http://www.eso.org/public/about-eso/dg-office/
[4] https://www.eso.org/public/about-eso/mission-vision-values-strategy/
[5] http://www.eso.org/public/teles-instr/lasilla/
[6] http://www.eso.org/public/teles-instr/paranal-observatory/
[7] http://www.eso.org/public/teles-instr/alma/
[8] https://elt.eso.org/

2. Management structure

2.1 Senior management

The DG, appointed by the ESO Council, leads the Organisation.

ESO's main organisational and operational units are the Directorates[9], each led by a Director. Currently there are five Directorates at ESO: Directorate of Administration (DoA), Directorate of Engineering (DoE), Directorate of Operations (DoO), Directorate of Programmes (DoP), and the Directorate for Science (DSC).

The DG, together with the five Directors comprise the Directors' Team (DT), ESO's highest level management structure. The DT is responsible for defining the horizontal priorities of the Organisation, both in the mid- and long-term. This includes developing the strategy of the Organisation with Council, establishing high-level goals and objectives for Council approval, and approving organisational level horizontal policies and procedures. It proposes potential new observatory programmes to Council, approves internal Programmes and implements structural changes that affect the whole Organisation. The DT ensures that the required proposal, approval and reporting processes are in place for Council and the auxiliary bodies (Finance Committee, Scientific Technical Committee, Observing Programmes Committee, Users Committee, etc) and, once approved, follows up on their implementation.

2.2 ESO organisational structure

Closely following its Mission, ESO's deliverables can be classified in three broad categories:

- Scientific data from its observatories
- Scientific infrastructures (telescopes, instruments and other facilities)
- Engagement actions (with the scientific community and beyond)

The organisational landscape has been implemented to deliver these elements. The key vehicles for such objective are the **Programmes**. Those are comprehensive and coherent sets of projects or operational activities that draw on organisational resources (budget allocations, staff from various directorates and organisational support services) to deliver its objectives.

There are two levels of Programmes:

Observatory Programmes. Those are defined in Article II of the ESO convention and require specific Council approval by two-thirds majority. The initial observatory programme

[9] http://www.eso.org/public/archives/static/about-eso/organisation/public-organigram.pdf

was established in the convention and it became the core of the La Silla observatory. The rest of the Programmes are optional, but they are all participated by all Member States. La Silla and Paranal were merged into a single programme later. There are today four such Observatory Programmes (in historical order):

- La Silla Paranal
- ALMA
- ELT
- CTA

Organisational Programmes, or in short **Programmes.** These are *development programmes* which are set by the Organisation either to support the Observatory Programmes, or to develop the Organisation itself. The following are the current Programmes (in alphabetical order):

- ALMA Development Programme
- Data Flow System Development Programme
- ELT Construction Programme
- Information Systems Programme
- Instrumentation Programme
- Integrated Operations Programme
- Technology Development Programme

The **Organisational Units** (Directorates, Divisions, Departments and Groups) deliver objectives and provide support to the entire Organisation and its Observatory and Organisational Programmes.

The public organigramme (http://www.eso.org/public/archives/static/about-eso/organisation/public-organigram.pdf) in its most recent version is applicable to this document.

2.3 Directorates

The Directorate of Administration (DoA) provides services and guidance in human resources, financial management, contracts and procurement, facilities and logistics, site safety responsibility in Garching and Santiago, and Enterprise Resources Planning services, as well as the horizontal information systems projects.

The Directorate of Engineering (DoE) is responsible for IT services and solutions for all ESO sites, and for providing engineering support for the design, manufacturing, installation, corrective maintenance, upgrade as well as support to the operation of telescopes, instruments and auxiliary equipment.

The Directorate of Operations (DoO) is responsible for all science operations-related activities including the preparation and execution of observing programmes, the operation of the ESO telescopes, the user support, and the delivery and curation of their data. DoO further carries out development programmes related to its operational and future sites.

The Directorate of Programmes (DoP) is responsible for the management and delivery of the construction phase of ESO's projects and programmes, in close collaboration with DoE within ESO's matrix organization.

The Directorate for Science (DSC) is responsible for defining the scientific requirements and priorities for ESO's facilities, for the interactions with the scientific community, for providing a scientific environment suitable for staff astronomers, fellows and students and visitors from the Member States, for the organisation-wide documentation services and for the ESO Supernova.

2.4 Programmes

At ESO, (Organisational) Programmes (cf. Sect. 2.4) are defined either as a coherent set of projects with an overall budgetary envelope or as a single large and time-limited project/programme with its own Cost to Completion including contingency.

Each programme has a Programme Manager who is responsible for its overall coordination and execution. Depending on their nature, Programmes have also a Programme Scientist and/or a Programme Engineer. Programmes are by nature cross-directorate activities involving people from various (if not all) directorates, in particular making use of the matrix structure.

In this document, Programmes are described in the section corresponding to the Directorate where they are managed from, bearing in mind that resources and responsibilities are often spread across most if not all the Directorates.

3. Directorate of Administration (DoA)

The ESO Directorate of Administration (DoA) organises ESO's administration in Garching and in Chile. The functions include human resources, financial management, contracts and procurement services, facilities and logistics, safety coordination, the ERP services, as well as the operation of the Vitacura campus and the guesthouse in Chile. The Director of Administration provides support to the DG in external relations' activities and functions, and represents ESO in the ALMA Heads of Administration meetings, and in the CERN Pension Fund matters. The Office of the Director of Administration deals with arrangements for the Finance Committee meetings. Furthermore, the Director of Administration acts as the site safety responsible of the Garching and Santiago sites with the support of the site safety engineer.

The Director of Administration leads the DoA and reports to the DG.

DoA includes the following Departments and Offices :

- Administration Office
  - ERP
  - Safety
  - Insurances
  - Grants
  - Social Security
- Contracts and Procurement Department
- Facilities and Logistics Department
- Finance Department
- Human Resources Department

DoA also manages the Information Systems Programme.

3.1 Administration Office

The Administration Office comprises the following groups and tasks:

3.1.1 ERP

The ERP Team is responsible for the maintenance and update of the ERP system; implements new business processes as required and provides user support.

3.1.2 Safety

Safety at ESO Headquarters Garching, Vitacura and the Guesthouse covers all aspects of occupational health and safety, environmental protection, safety of equipment and installations as well as operational safety. The sustainable and continuous improvement process at the site is an integral management goal to ensure a safe and healthy work environment to everybody.

3.1.3 Insurances

The insurance officer develops ESO's insurance strategy, manages the insurance portfolio, controls the services of the insurance broker, and provides advice and guidance on insurance matters to ESO's staff.

3.1.4 Grants

The Grants Officer coordinates and administers all third party funded projects at ESO.

3.1.5 Social Security

The Social Security Policy Manager analyses and monitors the evolution of the elements of the social security landscape at ESO. They propose strategies on how to position ESO on social security policy updates, advise Management with that regard, lead respective projects and work closely with HR, FIN and Legal.

3.2 Contracts and Procurement Department (CP)

The Contracts and Procurement Department (CP) is responsible for executing procurement actions. CP contract officers are strategic business partners for project managers and give guidance for contractual/commercial matters. CP also plays an active role in procurement related upstream and downstream activities, including in the definition of efficient procurement strategies and in the monitoring of the procurements after the orders are placed/contracts are awarded. CP ensures that goods and services are procured in full compliance with ESO's policies, rules and procedures. CP operates in an integrated way between the unit in Garching and in Santiago. Within these functions, CP:

- Maintains an up-to-date suppliers' database and in this respect ensures adequate coordination with ESO's industrial liaison officers (nominated by each Member State) so as to further develop the pool of suppliers in the ESO Member States.
- Coordinates the timely preparation of all relevant documentation required for approval and procurement actions.

3.3 Facilities and Logistics Department (FL)

The objectives of FL are to efficiently plan, construct, operate and maintain the ESO facilities, grounds and infrastructure at the Garching site, including the ESO Supernova and the Santiago sites (Vitacura and ESO Guesthouse in Las Condes).

In order to ensure that staff, students and visitors can work in a safe workplace, environmental considerations are integrated in the planning, modernisation and maintenance of all facilities at ESO Headquarters and Santiago.

The Logistics team is in charge of transport and goods reception and coordinates shipments between Europe and Chile. Additionally, the department provides support for staff removals and coordination with the travel agency for staff travels, oversees car insurance for Chile and organizes social events in Vitacura. Import/ export and customs clearances are also part of the duties.

3.4 Finance Department (FIN)

The Finance Department (FIN) ensures that financial resources are used according to the applicable rules and regulations, and in line with the directions defined by ESO's governing bodies. The activities of FIN cover four main areas: budgeting & controlling, accounting (including payroll), invoice control and treasury. FIN operates in an integrated way between the units in Garching and in Santiago. Within the above responsibilities, FIN conducts the following activities:

- Budget preparation for approval by governing bodies, budget planning support to managers, and monitoring and coordination with the controllers,
- Financial planning for medium and long range, as well as cash flow planning,
- Cash management and general accounting services,
- Payroll accounting,
- Invoice control,
- Bank and treasury,
- Periodical Financial Statements,
- Financial analyses,
- Coordination with External Auditors.

3.5 Human Resources Department (HR)

Human Resources is responsible for ESO's employment relationship with its staff. This includes

- recruitment,
- contract formation,
- remuneration,
- pension,
- health,
- welfare, and
- development

and all of the systems required to deliver a robust HR service to approximately 750 staff, fellows and students. Furthermore, the department encompasses the Human Resources strategy.

3.6 Information Systems (IS) Programme

The IS Programme was established to address gaps in ESO's Configuration Management (CM), Documentation Management (DM), Information Management (IM), and Quality Management (QM) systems. Acting as an umbrella for all IS-related projects, the programme ensures strategic alignment, coherence, and coordination of information systems across ESO. Its key objectives include aligning systems with organisational goals, enabling better data integration and analysis for informed decision-making, optimising resources, and preventing duplication of efforts. The programme also emphasises collaboration through integrated systems, adherence to the Quality Management System, and alignment with ESO's Cyber Security Strategy to safeguard data and ensure business continuity. By providing a unified and holistic view of systems, the IS Programme supports ESO's strategic and operational excellence. The IS Programme is led by the Directorate of Administration.

4. Directorate of Engineering (DoE)

The Directorate of Engineering (DoE), is responsible for IT services and solutions for all ESO sites, and for providing engineering support for the design, manufacturing, installation, corrective maintenance, upgrade and support to the operation of telescopes, instruments and auxiliary equipment. It also provides consultancy and support to project design activities, as well as contract follow up including preparation of plans, specifications and budget estimates. The main partners of the Directorate of Engineering are the Directorate of Programmes, the Directorate of Operations and the Directorate for Science. The Director of Enginering leads the DoE and reports to the DG. The Director of Engineering is responsible for the overall line management of the Directorate and for defining and implementing the DoE strategy. They also act as Chair of the IT Cyber Security Board.

DoE is divided into:

- DoE Management Office
- Information Technology Department
- Control Software and Control Engineering Department
- Electronic Engineering Department
- Mechanical Engineering Department
- Optical Engineering Department
- Science Operation Software Department
- Systems Engineering Department

4.1 DoE Management Office

The DoE Management Office is in charge of a variety of management tasks, including line management and the oversight of the allocation of the staff effort for the Directorate.

The DoE Executive Officer is responsible for defining and maintaining the ESO FTE allocation process. They also oversee its implementation in the DoE. Furthermore, they own the process for selecting engineering fellows and students. The office provides administrative support to all DoE Members of Personnel.

4.2 IT Department (ITD)

IT is structured around four main groups:

- IT Operations Chile
- IT Operations Garching

- IT Projects and Security
- IT Architecture

The IT Operations Chile and IT Operations Germany groups are responsible for the day-to-day IT operations and the delivery of the agreed upon services to the site customers.

The IT Projects and Security group is responsible for IT projects, the implementation of the cyber security programme and the control of cyber security risks.

The IT Architecture group ensures that the technical solutions are seamlessly aligned with the organisational objectives, while governing and maintaining control over the ESO IT infrastructure.

4.3 Control Software and Control Engineering Department (CSE)

As part of the project teams, members of the Control Software and Control Engineering (CSE) department in DoE are specifying, analysing, designing, implementing, verifying and maintaining control systems and are responsible for the development of control software for (optical and radio-) telescopes and astronomical instruments over the full software lifecycle.

The CSE is divided into following groups:

- Instrument control software
- Observatory control software
- Control Engineering
- Real Time Computing
- Infrastructure and integration

4.4 Electronic Engineering Department (ELE)

The Electronic Engineering Department is responsible for the definition, design and manufacturing of control electronic and detectors system/subsystem for telescopes and instruments as well for electrical compliance verification for all ESO projects. The department domain of expertise is quite large and covers from instrument and telescope control electronics/automation to detector system design, production qualification and test. Its mission is also to define the electrical and electronic standards at the organisation level and to enforce their use in all projects to minimise the impact of technology evolution and guaranty uniformity over systems.

The department is constituted by four groups:

- Telescope and Instrument Electronic Engineering

- Electrical Compliancy Engineering
- Electronic Developments, Lab facilities & Workshop
- Detector Systems

4.5 Mechanical Engineering Department (MEC)

The Mechanical Engineering Department provides support to all ESO projects. As part of the project teams the department members are responsible for the definition, design, analysis, procurement and initial assembly of mechanical, opto-mechanical, cryogenic and vacuum systems for advanced astronomical telescope and instrumentation systems for all ESO observatories.

In addition, the mechanical department is in charge of providing and maintaining ESO standards for Mechanical, Cryogenic and Analysis requirements. It provides software support for the in-house CAD Systems, FE programs and Hazard Analysis tool. Furthermore, MEC supplies organized documentation platforms for whole ESO, i.e. PDM System and CAD PDM System.

The Mechanical Engineering department is subdivided into three groups. The group structure is based on products and engineering competences.

- Instruments and Cryo Systems
- Structural Analysis
- Telescopes and Large Structures

4.6 Optical Engineering Department (OPE)

The Optical Engineering Department provides support in the field of optics and photonics to all ESO projects. The technical expertise offered by the department includes the optical design, integration and testing of optical systems as well as photonics technologies and laser guide stars. The department supports projects in the field of system engineering and provides AIT managers for integration. In addition, it supports the observatory solving optical problems arising in systems in operation.

The department manages the optical and integration laboratories at ESO headquarters.

The Optical Engineering Department is split into groups, reflecting the major activities:

- Laser & Photonics
- Telescope and Instrument Optics
- Optical Alignment and Metrology

4.7 Science Operation Software Department (SCS)

The Science Operation Software Department (SCS) is responsible for all science operation software for the end-to-end operations of ESO observatories, La Silla-Paranal, ALMA, and ELT. Science operation software includes all components required for proposal submission, scheduling, execution, archiving, processing, visualization, and quality control of the observations. This software is used by operational teams within the organization for planning and running scientific operations, by scientific users in the community for the handling of observing proposals, the preparation of observations and the access and processing of observation data.

As part of the project teams, members of SCS are responsible for the design, implementation, maintenance, and support of science operation software for the end-to-end operations of the ESO observation systems (VLT, VLTI, Survey & La Silla Telescopes, ALMA, and ELT).

SCS is structured in three groups:

- Dataflow Infrastructure
- Pipeline Systems
- Software Engineering and Quality

The Dataflow Infrastructure Group is in charge of the preparation of observations and the handling of data and metadata. The Pipeline Systems Group is concerned with the prediction and the measurement of data quality, as well as the visualization and scientific processing of data. The Software Engineering and Quality Group provides the tools necessary to support the development process, the testing, the integration, and release of scientific operation software.

4.8 Systems Engineering Department (SEN)

The Systems Engineering Department provides system engineering services to all ESO projects. All essential functions are covered, including requirement engineering, system architectural design, system analysis disciplinary integration, verification & technical coordination. The Head of the department owns the engineering standards at ESO and is in charge of deciding on the recommendations made by the Engineering Standards Configuration Board.

The system engineering department is split into three groups and an office:

- Adaptive Optics Systems
- Instrument Systems
- Observatory Systems

5. Directorate of Operations (DoO)

The Directorate of Operations is responsible for all science operations-related activities including the preparation and execution of observing programmes, the operation of the La Silla Paranal Observatory (LPO), the off-site operation of the ALMA Observatory in the European region through the ESO ALMA Support Centre (EASC). The DoO further provides user support, data flow management, operations technical support, and the development and maintenance of a science archive through its Data Management and Operations (DMO) Division. The Science Archive Facility (SAF) holds all data obtained with ESO's observatories as well as highly processed, advanced products derived from them, and is responsible for their preservation, curation and delivery. The La Silla Paranal Observatory also provides support to a number of hosted telescopes, including the VST and APEX.

DoO further carries out development programmes related to its operational and future sites, i.e. currently the Wide-band Sensitivity Upgrade (WSU) programme for ALMA under the lead of EASC, the Data Flow System (DFS) development programme for the end-to-end operation of the VLT and ELT under the lead of DMO, and the Integrated Operations (IOP) programme for the future integrated operation of VLT and ELT under the lead of LPO. LPO further supports the on-site construction effort for the CTAO Southern array and prepares for its future operation.

The DoO is structured in three Divisions which are described in more detail in the following sections as well as their respective development programmes:

- La Silla Paranal Observatory (LPO) Division,
- Data Management and Operations (DMO) Division,
- ESO ALMA Support Centre (EASC) Division.

5.1 La Silla Paranal Observatory (LPO)

The La Silla Paranal Observatory (LPO) provides and operates some of the world's largest and most advanced observational facilities at three sites in Northern Chile. La Silla hosts the 3.6-m telescope, the New Technology Telescope (NTT), and a number of Hosted Telescope projects. Cerro Paranal is the home of the Very large Telescope, the VLT. Once the Extremely Large Telescope on Cerro Armazones is handed over from the ELT construction programme to operations, it will become an integral part of LPO. APEX, the Atacama Pathfinder Experiment, is a hosted telescope project located on the high altiude site of Llano Chajnantor.

LPO is structured as follows:

The Observatory is led by the LPO Director (the LPO Division Head), who is responsible for setting the overall goals, priorities and strategies within LPO for all operational aspects.

5.1.1 Paranal Departments and Groups

5.1.1.1 LPO Director's Office (X-LPO)

The LPO Director's office delivers all cross-functional processes important to operate the observatory.

Herein, the LPO Safety Office (SAF) provides all technical processes necessary to support the Director as the site safety responsible for all LPO sites. The LPO Director acts as the Programme Manager for LPO projects and interfaces to all external projects including the ELT and CTAO-South construction projects with the support of the Project Coordination Office (PCO).

System Engineering functions for Paranal are provided by Paranal System Engineering (PSE) group composed of the System Engineers and System Scientists.

The LPO Quality Office (LQO) provides support to the Director with quality management at LPO and runs the Change Control Board.

The LPO management team is composed of the Director, the Deputy Director and the Department Heads. The Deputy Director runs the LPO Director's Office which encompasses SAF, PCO, PSE, LQO, and secretarial support.

The LPO Directors Office also hosts the Integrated Operations (IOP) Programme.

5.1.1.2 Paranal Science Operations (PSO)

Science Operations is responsible for the execution of all scheduled observations and the production of astronomical data of highest quality. The department is further charged to maintain, and whenever possible, to improve the scientific and operational performances of the Paranal telescopes and instruments. The PSO instrument scientists lead the Instrument Operations Teams (IOTs) of all VLT and VLTI instruments.

The Department is composed of two groups:

- Operations Support Astronomers
- Telescope and Instrument Operators

5.1.1.3 Paranal Maintenance, Support & Engineering (MSE)

MSE provides all technical maintenance services and engineering support to the operational systems of the Paranal site and guarantees their highest availability and performance. The operational systems include the telescopes and their systems and sub-systems including the scientific instruments. In addition, MSE supports the assembly, integration, verification and commissioning of new facilities and systems delivered to Paranal by other ESO Directorates. MSE further provides all warehouse services to Paranal and operates the power station. Upgrade and obsolescence projects carried out by the Observatory frequently make use of expertise and resources from the Directorate of Engineering through matrix requests and allocations. A provision is made at DoE for unplanned maintenance activities that required expert engineering support. MSE is divided

into five groups according to engineering disciplines plus one group for cross-departmental support functions:

- Optics
- Instrumentation
- Mechanics
- Electronics
- Software
- Support and Quality Assurance

5.1.1.4 Paranal Logistics & Facilities Management (PLF)

PLF oversees all logistics aspects of the Paranal site containing transport, accommodation, catering, cleaning, and other site-related services. PLF further is responsible for the maintenance of the general infrastructure and facilities including all base-camp buildings and roads.

5.1.1.5 Cherenkov Telescope Array (CTA) Programme.

The Cherenkov Telescope Array (CTA) is the next-generation ground-based instrument designed to detect very high energy gamma rays, with sites in both the southern and northern hemispheres. The CTA is a formal ESO Observatory Programme and ESO is part of the CTA Observatory ERIC Organisation and its governing bodies. ESO hosts and will operate the Southern part of the CTA array on its Paranal property, on a cost-refund basis. The lead Directorate of this Programme is DoO. Working-level interactions between CTAO and ESO are coordinated by ESO's CTA coordinator within the Project Coordination Office of LPO.

5.1.1.6 Integrated Operations (IOP) Programme

The Integrated Operations (IOP) Programme ensures that the observational and operational resources of the future Paranal Observatory are used efficiently and effectively and seamlessly integrate the ELT as an additional telescope.

The Consolidation Phase (equivalent to a Phase B) of the IOP Programme was approved in 2023 and will deliver a sustainable, lean, and configuration-controlled operations process model and the definition of the associated implementation projects. Few high-priority projects have already been approved for implementation to ensure timely delivery for the start of operation of the ELT.

At the end of the Consolidation Phase the IOP Programme is expected to be approved as a cost-to-completion Organisational Programme. The IOP programme is led by LPO within the Directorate of Operations with the LPO Director currently acting as the programme manager of this programme.

5.1.2 La Silla Department (LSD)

LSD provides the technical operations, the maintenance, and the day- and night-operations of the La Silla site including the ESO-operated telescopes and the hosted telescopes. LSD further deals with all logistics tasks related to the La Silla site.

The Head of the LSD is the La Silla site manager. La Silla Department is further structured in three groups:

- Day & Night Operations
- Technical Operations & Maintenance
- Logistics

5.1.3 APEX Department (LSA)

ESO supports the operation of APEX as a hosted telescope project for the Max Planck Institute for Radioastronomy (MPIfR) in Bonn, Germany until the end of 2025. ESO is responsible on behalf of MPIfR for the operation and maintenance of its base station site at Sequitor near San Pedro de Atacama, the 12-m antenna site on Chajnantor at 5100 m altitude, as well as for all related logistics tasks.

The Head of the LSA is the APEX station manager who reports to the MPIfR on all operational matters and to the LPO Director on all staff-related and safety matters.

With the handover of APEX to MPIfR at the end of 2025, LSA will cease to exist.

5.2 Data Management and Operations (DMO)

The Data Management and Operations (DMO) Division is responsible for the off-site operations and user support of the La Silla Paranal Observatory (LPO) in the framework of an integrated end-to-end system, maintaining the archive facility and its data holdings as a powerful resource, both scientific and operational.

DMO is structured as follows:

5.2.1 DMO Office

The Head of the DMO Division is responsible for setting the overall goals, priorities, and strategies for DMO within DoO. The Office is supported by a data-flow systems project engineer and an end-to-end operations scientist who coordinate the development and implementation of all VLT/ELT data-flow system components with resources drawn from the engineering matrix.

5.2.2 User Support Department (USD)

The main role of USD is to be the interface between the users of ESO facilities (in particular those who take advantage of Service Mode observations) and the Observatories.

The User Support Department (USD) is based at the ESO Headquarters in Garching. Its main activities consist in providing support to users of ESO facilities, through the ESO Data Flow System. USD currently provides support for all the instruments available at the VLT, VLTI and the VISTA telescope (Paranal). Its main activities are user-oriented services

(proposal handling, helpdesk), Science Operations oriented services (link between the Observatory and the users) and general services (e.g. night astronomer tasks, instrumentation projects, Users Committee meetings). Since 2024, USD is responsible for the La Silla Paranal Observatory Telescopes schedule preparation and maintenance.

The Department is composed of two groups:

- User Support Astronomers
- Operations Support

5.2.3 Back-end Operations Department (BOD)

The main activities of BOD are:

- Generation of science data products for distribution through the ESO Science Archive.
- Phase 3, i.e. collection, verification and archiving of data products from the community (Public Surveys, Large Programmes, etc.).
- Scientific oversight to the reduction of ESO data, including scientific guidance for the development of pipelines.
- Development of front-end tool to ESO data reduction algorithms, the ESO Data Processing System (EDPS, which unifies all other use cases for data processing).
- Operations of the ESO Science Archive Facility.
- Scientific and operational development of the ESO Science Archive Facility.

The Department works in close collaboration with the Project Science Department, the Dataflow Infrastructure Department (INS), the Paranal Science Operations Department (PSO), the Science Operation Software Department (SCS) (including its Dataflow Infrastructure Group), as well as with the other Departments within DMO.

Raw data and, when applicable, data products from ESO facilities are stored in the ESO Science Archive Facility for further dissemination to the community. The Science Archive Facility is the single access point to ESO's data (e.g. Visitor and Service Modes, proprietary and open access, etc.).

The Department is composed of two groups:

- Science Data Quality Group
- Science Archive Group

5.2.4 Data Flow System (DFS) Development Programme

This development programme focuses on creating a comprehensive Data Flow System to support both the ELT and VLT (as well as La Silla), following a roadmap endorsed by the STC in 2018. It encompasses ongoing and future upgrade projects, addressing the

obsolescence of existing tools and integrating the requirements of the ELT and VLT. Particular emphasis is placed on ensuring seamless integration across all end-to-end data-flow processes. The programme includes projects that support the following key processes:

- Phase 1 Proposal Preparation
- Telescope Scheduling
- Exposure Time Calculators
- Phase 2 Observation Preparation
- Observing Tools
- Quality Control Tools
- Data Processing Environments and Tools
- Phase 3 Data Product Handling Tools
- Archive Services, Infrastructure and Interfaces

The DFS Development Programme is led by DMO within the Directorate of Operations with the Head of DMO acts as the programme manager of this programme.

5.3 ESO ALMA Support Centre (EASC)

The ESO ALMA Support Centre is responsible for off-site operations and user support of ALMA in the European (EU) region and works in close collaboration with the Joint ALMA Observatory (JAO). At the same time, it is the “face” of ALMA towards the scientific and technological community and institutes in ESO member states as well as towards the international ALMA partners (NRAO in North America, NAOJ in East Asia) during the ALMA operations phase.

EASC further manages the EU contributions to the ALMA development programme.

EASC is divided into four departments. The WSU Programme is also managed from EASC:

5.3.1 ALMA Regional Centre (ARC)

The European ALMA Regional Centre (ARC) provides the interface between the ALMA project and the European science community. It supports its users mainly in the areas of proposal preparation, observation preparation, data reduction and data analysis.

Unlike its partner ARCs in North America and Japan, the European ARC is organized as a coordinated network of scientific support nodes distributed across Europe. The central node is located at ESO Headquarters in Garching and carries the responsibility for all the core ARC activities as well as the coordination of the additional science support provided by the regional nodes and centres of expertise.

The European ARC is the point of contact for European ALMA users from the moment of proposal submission to the actual distribution of calibrated data and subsequent analysis via the ALMA Helpdesk.

5.3.2 ALMA Technical Team (ATT)

ATT is responsible for specific hardware maintenance support and providing technical expertise to ALMA, including development and maintenance of technical documentation and manuals. ATT also manages hardware development projects and supports development studies, which are carried out with institutes in ESO Member States. ATT, as IET-EU, is part of the quadrilateral ALMA Integrated Engineering Team, and in agreement with the ALMA partners, ATT may execute “in kind” contributions to the on-site hardware maintenance activities, as part of the overall optimization of the execution of the ALMA programme.

5.3.3 ALMA Computing (ACT)

ACT is responsible for the development and maintenance of the ALMA software subsystems. In collaboration with similar sized groups at the other ALMA Executives and the JAO, ACT is part of the Integrated Computing Team (ICT). ACT maintains responsibility for the Computing subsystems that were developed in Europe during ALMA construction. The key areas of responsibility are Archive Services, Observing Preparation, Observatory Interfaces (supporting the full observing project workflow), Telescope Calibration and Automation & Testing. The ACT is in addition a major contributor to Data Processing software, namely CASA and Pipeline Heuristics. Apart from regular maintenance, all ALMA subsystems are still in active development to support growing and changing demands from the observatory. The ACT also contributes to ALMA Development projects.

5.3.4 ALMA Development Team (ADT)

The ADT is responsible for facilitating the delivery of the Wideband Sensitivity Upgrade (WSU) Programme as well as longer-term European ALMA development. The department implements the ALMA2030 vision as described in the ALMA Development Roadmap and oversees and financially manages the execution of development projects and studies. It strategically plans the European ALMA development priorities and liaises with ALMA partners, industry, and institutes in Europe. The ADT also hosts the European members of the Integrated Development Team (IDT) as well as the European Development Manager.

5.3.5 Wide-band Sensitivity Upgrade (WSU) Programme

The Wideband Sensitivity Upgrade is the first of the ALMA 2030 priorities to be implemented, as defined in the ALMA Development Roadmap. The primary goal of the WSU is to broaden the ALMA receiver bandwidth by at least a factor two (x2), with a goal of a factor of four (x4), and to upgrade the associated electronics and correlator. Tentatively, ESO is responsible for the FOS (AOS-OSF Fiber Optic System), the Band 2, Band 7, and Band 9 receivers, the WIFP (IF Switch/Digitizers/Digital Signal Processing), and selected parts of the offline and online software. ESO is heavily involved in the WSU, through management of the overall project, executing and contributing to reviews, participation in working groups, system engineering, and technical evaluation. The WSU programme for

ALMA in Europe is led by EASC within the Directorate of Operations with the Head of EASC acting as the programme manager of this programme.

6. Directorate of Programmes (DoP)

The DoP is responsible for the management and delivery of ESO's construction programmes and projects within ESO's matrix organization. The overall work is broken down into three programmes:

- ELT Construction Programme
- Instrumentation Programme (including Paranal, Armazones and ELT instrumentation)
- Technology Development Programme

Each of these programmes has a Programme Manager who is accountable for the delivery of the programme to time, cost and quality, and has both the responsibility and the authority to set priorities for the work in their area. Within the programmes there are many projects.

DoP is divided into five organisational units:

6.1 Office of the Director for Programmes

The Director of Programmes has the overall responsibility for the successful delivery of the Programmes within the agreed specifications, budget and schedule, and is responsible for setting the overall priorities within and between the programmes, and the approval of project. The Office of the Director of Programmes includes the Programme Planning & Controlling Office (PPCO). The role of the Programme Planning and Control Office is to provide services for the ESO Programmes, including ELT construction, Technology Development, Instrumentation, Information Systems, Wide-Band Sensitivity Upgrade and Integrated Operations Programme in the following areas:

- Planning and Budgeting
- Schedule and Cost Control
- Support to Change Control Management
- Financial and Programmatic Reporting
- Estimating
- Risk Management
- Performance Measurement (including, where possible, Earned Value Management)

Internal to DoP, there are strong interfaces with all the programmes and with the Project Management Department (PMD), with regular interactions with the project managers for their day-to-day work. PPCO also retains a strong link to the PMD in terms of development of best practice and support of and training of project managers.

6.2 ELT Programme

The ELT Programme Office is led by the ELT Programme Manager, who is responsible for the planning and delivery of the ELT Construction Programme. The handover of the telescope to Operations will happen once the first instrument has been successfully delivered by the Instrumentation Programme and verified on the telescope by achieving the Scientific First light Milestone. -. Dedicated personnel for programme engineering, telescope science, financial and budget control, quality and product assurance and archiving support the Office in order to ensure the central management of the activities of the ELT Work Packages. The overall ELT Programme is supported by the PPCO and its additionally includes project managers from the PMD and DoE, the Programme Scientist from DSC, an AIV manager and ELT System Engineer from DoE, and is also supported by the Garching and LPO Safety Engineers.

6.3 Instrumentation Programme

The Instrumentation Programme is responsible for the delivery of all the optical and infrared instruments (current and future) for the VLT/I (former PIP) and for the ELT (construction-funded instruments and former AIP). The Programme Manager is supported by a deputy, a programme engineering team and the PPCO. In terms of scientific leadership, the Instrumentation Programme is supported by three Programme Scientists for VLT, VLTI and ELT Instrumentation.

6.4 Technology Development Programme (TecDev)

The TecDev Programme aims to develop and secure key technologies which will maintain ESO's facilities at the cutting edge of astronomy and which will contribute to achieving ESO's mission. In practice, this means taking technologies which are at low levels of technology readiness and developing them to a level sufficient to be incorporated within new projects with manageable risk. The TecDev Programme also supports technology development for new ESO standards.

The Programme is led by a Programme Manager, who is supported by a Technology Development Advisory Team to choose the projects to be supported and by the PPCO for overall programme management and control. The Technology Development Programme is led by the Directorate of Programmes.

6.5 Project Management Department (PMD)

Within the programmes of DoP, multiple projects are defined and implemented. These projects are led by project managers, who form the PMD.

The PMD aims to ensure that projects are implemented within the framework, plans and standards defined by the DoP programmes, and according to common standards and quality within all the projects.

The Head of the PMD holds a key role in the Organisation's project management effort and drives the culture, and set standards for project management, and works closely with the Programme Managers to ensure that their requirements are met and that the allocated staff is suited to the tasks ahead.

6.6 Onsite Engineering Department (OED)

The On-Site Engineering Department is a department set up primarily to host the engineers and technicians needed on-site for the ELT AIV. It also hosts the people who support the DMS and the ELT Supporting Systems activities on site. In the long-term the department will be in the Directorate of Engineering. Until the full ramp up of the AIV activities on Armazones, the Department is located in the Directorate of Programmes and led on an interim basis by the ELT AIV Manager.

7. Directorate for Science (DSC)

The Directorate for Science (DSC) supports community science with ESO facilities, provides the scientific environment for the astronomers at ESO, and runs the ESO student and fellowship.

7.1 Office of the Director for Science

The management of the Directorate comprises the Director, Deputy Director, the Department Heads and the Programme Scientists. The Director, together with the Programme Scientists, organises meetings of the Scientific Technical Committee and its subpanels.

There are five Programme Scientists at ESO corresponding to the Very Large Telescope (VLT), VLT Interferometer (VLTI) supporting La Silla Paranal, Atacama Large Millimeter/submillimeter Array (ALMA), ESO Extremely Large Telescope (ELT), and the Cerenkov Telescope Array (CTA) Observatory Programmes. The Programme Scientists are responsible for developing and maintaining a strategic science vision for the respective programme by:

- Providing the scientific leadership of the programme;
- Working with the Programme Manager in developing a long term plan for the programme;
- Developing and maintaining the science requirements of the programme;
- Preparing and ensuring the scientific top level requirements of the programme;
- Approving the scientific top level requirements for each project within the programme;
- Advising on the strategic scientific goals of the programme, and
- Consulting the scientific community and ESO DT to formulate and eventually develop a scientific vision for the programme.

7.2 Project Science Department (INSC)

The Project Science Department hosts and supports ESO Project Scientists, providing scientific leadership, guidance and monitoring for the design, development and implementation of ESO instrumentation. Project Scientists are responsible for developing and maintaining the science requirements, ensuring compliance with the scientific goals of the respective programmes and with operation standards while maximizing scientific exploitation. They are the project science contact points for ESO and the consortia, and

interact closely at ESO with the Programme Scientists, the Programme Managers, the Project Managers, the Project Engineers in the DSC, DoP, DoO and DoE.

The tasks include:

- Developing the scientific cases and top-level requirements for the project and agreeing these with stakeholders;
- Monitoring and maintaining the predicted system scientific performance by following all system and sub-system design processes and performance predictions;
- Ensuring the project includes all tasks and work required to be successful;
- Chairing of the Instrument or Project Science Team if one is appointed;
- Working together with the Project Manager and Project Engineer when presenting the project to management;
- Supporting the development of a robust and efficient operation framework (e.g., observing templates, INS control software, etc);
- Ensuring system scientific performance through the instrument commissioning and science verification

7.3 Observing Programmes Office (OPO)

ESO interacts with the community scientists for the observing programme definition, selection and scheduling of successful proposals via the Observing Programme Office (OPO). The OPO is charged with all activities related to the proposal handling:

- Preparation and release of the Call for Proposals;
- Organisation of the Observing Programmes Committee meetings twice per year;
- Keeping track and handling of the contractual obligations of ESO towards guaranteed observing time holders;
- Handling of the Director’s Discretionary Time proposals;
- Management of ESO’s contribution to on-going public surveys;
- Preparation of statistics concerning observing time to the ESO governing bodies, and
- Defines the specifications of an integrated proposal handling system, including the processes required for the ESO ELT.

7.4 ESO Supernova

The ESO Supernova Planetarium & Visitor Centre is a cutting-edge astronomy centre for the public, located at the site of ESO Headquarters in Garching.

By sharing the fascinating world of astronomy, the ESO Supernova Planetarium & Visitor Centre aims to inspire coming generations to appreciate and understand the Universe around us. Comprising a digital planetarium and 2200 m^2 exhibition, the centre provides visitors with an immersive and interactive experience. The education programme engages teachers and students from all pre-University levels with learning experiences through enquiry-based workshops that cover a variety of aspects of astronomy and related engineering. Aiming to bring the public and school pupils closer to real science, the vast majority of the programmes of the ESO Supernova are delivered by active scientists and engineers. The centre strives to be accessible for a diverse audience.

7.5 Offices for Science

Two Offices for Science provide local support for the research activities of the ESO astronomers (about 90 Faculty astronomers) and of the fellows and students (35 Fellows and 30 Students) in Garching and Vitacura, by:

- Organising colloquia, seminars and local research groups;
- Managing the budgetary resources for the science travel of all astronomical staff, fellows and students;
- Organising the ESO workshops;
- Managing and administering the ESO fellowship programme, other fellows, students and scientific visitors;
- Coordinating astronomers at ESO, including those in the other Directorates via the vehicle of the Astronomers Faculty (further described below), such that they can provide expert advice to all ESO science programmes;
- Establishing close contacts and collaborations with the local astronomical communities (e.g. with International Max-Planck Research School, Excellence Cluster, TUM, LMU, ESO-Gobierno de Chile Comité Mixto, ESO-Chile Committee).

Astronomers across the Organisation and from all Directorates make up the ESO Astronomers Faculty. Its main role is to develop collective views on major scientific, technical and operational issues facing the organisation, such that the organisation is better able to fulfil its mission. The Astronomers Faculty elects a Faculty Chair in both Vitacura and Garching, for a period of 3-4 years, during which they take on the responsibility for leading the Offices for Science in Vitacura and Garching respectively. Additionally, the two Faculty Chairs become members of the Scientific Personnel Committee (SPC), together with four Faculty astronomers and the Director for Science. Ordinarily, the role of SPC

Chair rotates between the two Faculty Chairs, at the discretion of the DG. The SPC evaluates the scientific credentials of astronomers, ensuring a minimum standard is achieved before an appointment is made into a position that requires research expertise, and before an indefinite appointment can be made.

7.6 Library, Documentation, and Information Services (LDIS) Department

The Library, Documentation, and Information Services (LDIS) Department is a central information unit at ESO. It consists of the Libraries and the Information Repository teams.

The ESO Libraries in Garching and Santiago:

- Coordinate Library and Information Services activities
- Develop and curate productivity measures, in particular the ESO Telescope Bibliography (telbib)
- Monitor developments in scholarly communication such as Open Access publishing, provide advice, and represent the researchers' view vis-à-vis publishers and service providers
- Maintain an infrastructure for "ESO Conference Proceedings 2.0"
- Support the Office for Science with further developments of the People Vis tool
- Provide advice on the use of Digital Object Identifiers (DOIs) at ESO
- Host various legacy archives
- Participate in, or lead, international collaboration among the astronomy librarians' community and the EIROforum Librarians working group

The ESO Information Repository (PDM):

- Manages and supports the centralization, organization, preservation and distribution of ESO institutional, project and product documentation
- Administers, configures and operates the PDM
- Defines and implements documentation processes in cooperation with the PDM Stakeholders Committee under the guidance of the Directors Team
- Develops and carries out routines for efficient integration of existing documents into the system and identifies opportunities for data mappings between the repository and other relevant systems
- Provides trainings and documentation guidelines for PDM Assistants, users, and external parties

8. Office of the Director General (ODG)

The ODG deals with various activities that are under the direct authority of the DG (i.e. not delegated to the Directors). The ODG includes two departments:

- Executive Office
- Department of Communication

It also includes the Internal Auditor and the Quality and Sustainability Office (QSO).

8.1 Internal Audit

Internal Audit carries out an independent, objective assurance and consulting activity designed to add value and improve the Organisation's operations and it is there to assist all levels of management in the Organisation. Another task is to support the external auditors. Although reporting to the DG, the Head of the Internal Audit also has a direct line to the Council President, in particular when dealing with audits affecting the DG or the ODG.

8.2 Quality and Sustainability Office

The Quality and Sustainability Office (QSO) is a group in the ODG providing corporate services and support in matters related to Quality, Corporate Risk Management and Sustainability. In particular, the QSO includes the following functions:

- The **ESO-wide Quality and Process Manager**, who is the Information Systems (IS Programme) requirements manager, maintaining an updated process inventory and fostering continuous improvement by proposing and supporting process optimisation. The Quality and Process Manager has a direct reporting line to the Director General for QMS related topics, where needed.
- The **Sustainability and Diversity Officer (SDO)**, who provides leadership and support in planning and executing Sustainability, Diversity and Corporate Social Responsibility actions inspired by the UN Sustainable Development Goals, focusing on environmental and social aspects, including Diversity and Inclusion. In this task, the SDO receives advice and support from the Environment Committee and the Diversity & Inclusion Committee, which the SDO chairs.

  The Diversity, Equity and Inclusion Committee is established to provide advice to the ESO Director General on how to promote and enhance diversity, equity, and inclusion (DEI) within the organization, fostering a culture of belonging and respect for all employees.

  The Sustainability Committee will support the development and implementation of ESO's organisational sustainability strategy.

- **Corporate Risk Management**, in support to the Directors Team.

8.3 Executive Office (ODG-X)

ODG-X provides support to the DG with their internal and external duties. ODG-X includes the following groups:

- Representation in Chile
- Legal and Institutional Affairs

ODG-X also supports Council with the development and implementation of ESO's strategy when required and provides executive and secretarial support to the DG, Council, the DT, and other auxiliary bodies.

8.3.1 Representation Office in Chile (REP)

The REP represents ESO and the DG in interactions with the Chilean governmental, regional and local authorities, as well as with diplomatic missions in Chile. It coordinates the representation of ESO's political and legal interests in Chile and promotes ESO's positive relationship with Chile at all levels — government, research organisations, universities, and society at large.

The ESO representative is also the Vitacura Site Coordinator, coordinating with the heads of the various ESO units present in Vitacura and with the JAO about ALMA Santiago Central Office site operational activities. In emergency situations the Vitacura Site Coordinator will collaborate with the designated Vitacura Emergency Coordinator. In addition, they authorise activities at access to the Vitacura Campus.

8.3.2 Legal and Institutional Affairs (LIA)

The LIA advises and assists the DG with matters concerning the Organisation's institutional relations, protocol and diplomacy, defends ESO's legal interests and provides legal advice.

It also deals with personal data protection, various corporate policies, and intellectual property matters, including technology and knowledge protection and licensing.

8.4 Communication Department

The Communication Department (COMM) is responsible for developing and executing ESO's communication strategy with the aim to raise awareness of ESO among different audiences including the scientific community, the Member States, the general public and the media. For that purpose, it publicises worldwide the excitement of astronomy and the success of ESO, of its facilities and of its staff, using all possible and constantly evolving

communication technologies, channels and formats. It also proactively facilitates internal communication at ESO.

It consists of:

- Media Relations Team
- Internal Communication
- Communication Chile
- Creative Team
- Web Team

9. Inter-directorate structures

9.1 ESO Safety Commission

Safety at ESO is overseen by a Safety Commission.

The ESO Safety Commission is chaired by the Director General. The Safety Commission is responsible for:

- Monitoring the evolution of the Safety Policy and standards and advising when a change in the ESO regulations or policies may be necessary.
- Co-ordinating between the sites to ensure a coherent set of standards and norms for the operations or manufacturing/procurement of goods/services.
- Formulating appropriate actions when deviations from the ESO policy occur at any site, or with respect to any other issues relating to Safety requiring attention.

The Commission comprises:

1. The Chair
2. The Site Safety Responsible
3. Their respective Site Safety Engineers
4. Members of the ESO Management nominated by the Director General.

The ESO Safety Commission meets as required, but at least every semester to review the status and activities, suggestions on Safety matters, incidents and accidents.

9.2 Ombuds

ESO's Ombuds is a designated neutral that provides independent, impartial and confidential assistance to all members of personnel for the informal resolution of work-related disputes.

The Ombuds services are guided by its Terms of Reference, the Staff Rules and Regulations, the Regulations for Local Staff Members in Chile and the Standards of Practice and Code of Ethics of the International Ombudsman Association, included in the following principles: Independence, impartiality, confidentiality and informality.

While keeping strict confidentiality the Ombuds also provides feedback to the organization and makes informal recommendations to address systemic issues. The use of the Ombuds is a protected activity.

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