



ESO

European Organisation
for Astronomical
Research in the
Southern Hemisphere



The European Organisation for Astronomical Research in the Southern Hemisphere (ESO) is the foremost intergovernmental astronomy organisation in Europe and the world's most productive ground-based astronomical observatory. ESO carries out an ambitious programme focused on the design, construction and operation of powerful ground-based observing facilities enabling astronomers to make important scientific discoveries.

ESO operates three unique world-class observing sites in northern Chile: La Silla, Paranal and Chajnantor (home to ALMA and APEX), and the ESO Headquarters are located in Garching, near Munich, Germany.

At Paranal, ESO operates the Very Large Telescope, the world's most advanced visible-light astronomical observatory, and will host and operate the southern array of the Cherenkov Telescope Array, the world's largest and most sensitive high energy gamma-ray observatory. ESO is a major partner in ALMA, the largest astronomical project in existence. And on Cerro Armazones, ESO is building the 39-metre Extremely Large Telescope (ELT), which will become "the world's biggest eye on the sky" and whose operations will be fully integrated into the Paranal Observatory.

For its Data Management and Operations Division, within the Directorate of Operations at its Headquarters in Garching, near Munich, Germany, ESO is advertising the position of

Database Architect/Data Scientist

The Data Management and Operations (DMO) Division is responsible for the off-site operations and user support of ESO's La-Silla Paranal Observatory, maintaining an archive facility and its data holdings as a powerful resource, both scientific and operational. This is done in the framework of an integrated end-to-end data flow system that encompasses the entire lifecycle of the science data from the definition and submission for selection of new ideas in the form of observing proposals (Phase 1), to the definition and validation of the detailed observing strategy (Phase 2), to the stewardship and handling of data in the Science Archive (Phase 3).

Databases are at the heart of this data flow system, storing and handling the vast amount of metadata that describe the different entities and their complex relations. The successful candidate will have the opportunity to lead the architectural development of such databases system, as well as its mining.

Main Duties and Responsibilities:

Database Architect – Take responsibility as Database Architect for all La Silla Paranal Observatory dataflow databases, including the ELT:

- Understand the problem domains of VLT/ELT dataflow software projects.
(phase 1 proposal submission, phase 2 observation preparation and execution, data/metadata archiving, phase 3 data products, data reduction infrastructure)
- Design, test, document and deploy DB schemas and their interdependencies in close collaboration with the development team including uni- and bi-directional DB replication between Garching HQ and observatory sites in Chile.
- Ensure maintainability and scalability of SAP ASE, SAP IQ (keyword repository, astronomical catalogues) and MS SQL Server databases.
- Ensure and optimize performance of operational databases. Suggest and realize schema improvements, establish and enforce conventions and best practices in close collaboration with development team.



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- Design and ramp up noSQL DB infrastructure (Couchbase, ElasticSearch) in Garching and Paranal incl. replication in collaboration with IT department.
- Develop and realize concepts for the provisioning of SW development/integration with sandboxed SQL/noSQL DB environments for testing without interference with other projects.

Database Owner – Take ownership (DBO) of all dataflow relational and noSQL DB schemas in integration, public demo and production environments:

- Maintain DB content including ETL scripting.
- Coordinate with database content management team (DBCM).
- Design, test, document and deploy DB content management tools.
- Manage permissions.
- Maintain strong interface to IT department responsible for DB administration (DBA).

Data Scientist – Support the mining of the databases to derive meaningful insight that is not otherwise obvious.

- Mine and analyze astronomical meta-data and data in innovative ways in order to derive meaningful insights, trends and patterns, and interpret results with a clear objective in mind.
- Present the outcome of the analysis and communicate solutions to stakeholders and implement improvements as needed to operational systems.

Reports to:

The Head of the Archive Content Handling Group.

Key Competences and Experience:

Essential Competences and Experience

- In-depth experience in the design of relational and noSQL DB schemas
- Expert-level SQL programming
- Strong knowledge about concepts of data warehousing (e.g. SAP IQ)
- Advanced Python programming skills
- Proficiency with data mining and deep learning frameworks
- Strong networking and interface building skills to IT department, SW development team and dataflow operations stakeholders at all sites

Desirable Competences and Experience

- Knowledge of astronomical data standards
- Expert knowledge of SAP ASE/IQ and SQL Server
- Familiarity with basic project management concepts and practices

Very good self-organization and time management is a must, coupled with the ability to prioritize multiple tasks. Communication and interpersonal skills are required, with the ability to adapt and to work efficiently in a multi-cultural environment, both independently and within a team. A strong sense of team spirit is essential.



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Qualifications:

University degree in Computer Science, Astronomy, Physics or similar.

Language skills:

The position requires a proficient knowledge of English.

Remuneration and Contract:

We offer an attractive remuneration package including a competitive salary (tax free), comprehensive pension scheme and medical, educational and other social benefits, as well as financial help in relocating your family and the possibility to place your child/children in daycare.

ESO aims to support members of personnel in maintaining a good work-life balance (<https://www.eso.org/public/jobs/conditions/intstaff/#work-life-balance>) between their professional and private life. ESO is also committed to offering family-friendly support (<https://www.eso.org/public/jobs/conditions/intstaff/#family-friendly-support>), creating a work environment and policies which allow staff to balance their professional and private responsibilities through flexible working arrangements and financial support for families.

The contract is for a fixed term duration of three years, and is subject to successful completion of the probation period. There may be a possibility of extension(s) subject to individual performance and organisational requirements and as defined in the applicable policies and staff rules and regulations. For any further information, please visit [ESO's conditions of employment](#). Please note that the contract policy and in particular the regulations concerning fixed-term and indefinite contracts are currently under review which may lead to changes in the contractual conditions applicable to this position.

Duty Station:

Garching near Munich, Germany with the possibility of duty trips to all ESO sites in Chile.

Career Path: V

Application:

If you are interested in working in areas of frontline science and technology and in a stimulating international environment, please visit <http://www.eso.org> for further details.

Applicants are invited to apply online at <http://jobs.eso.org/>. Applications must be completed in English and should include a motivation letter and CV. Within your CV, please provide the names and contact details of three persons familiar with your work and willing to provide a recommendation letter upon request. Referees will not be contacted without your prior consent.

Deadline for applications is 26 June 2022.



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Interviews are expected to start soon after this date.

ESO has established diversity as an important value of the Organisation, is committed to providing an equal opportunities environment and is actively seeking to promote a diverse and inclusive workforce.

No nationality is in principle excluded, however, recruitment preference will be given to nationals of Australia, Austria, Belgium, the Czech Republic, Denmark, Finland, France, Germany, Ireland, Italy, the Netherlands, Poland, Portugal, Spain, Sweden, Switzerland, the United Kingdom and Chile irrespective of gender, age, disability, sexual orientation, ethnicity or religion.