Working at ESO

Reaching New Heights in Astronomy

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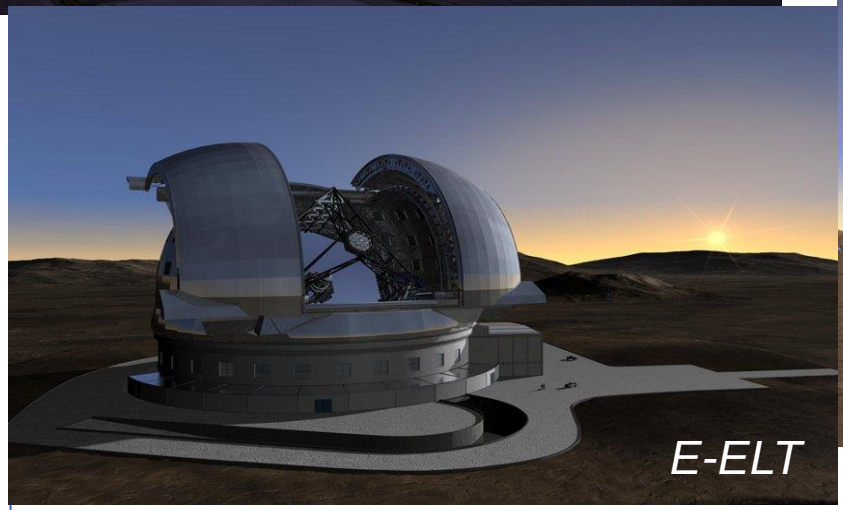
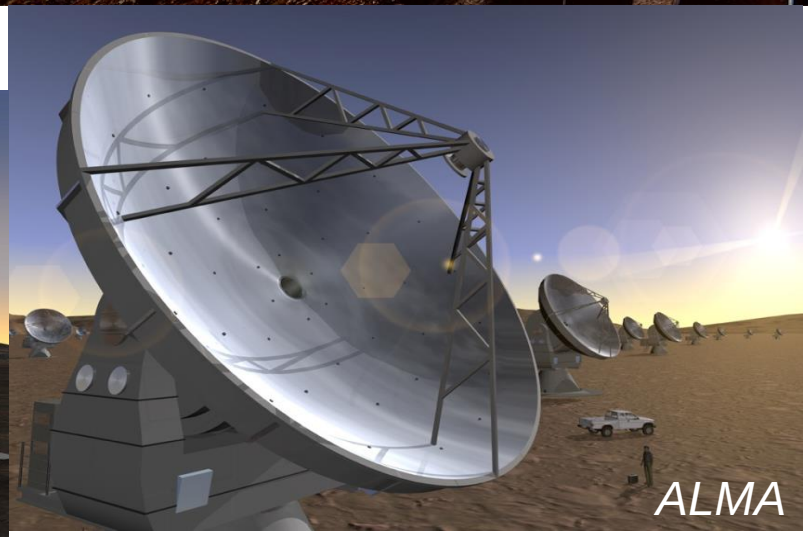
Astronomy at an Observatory

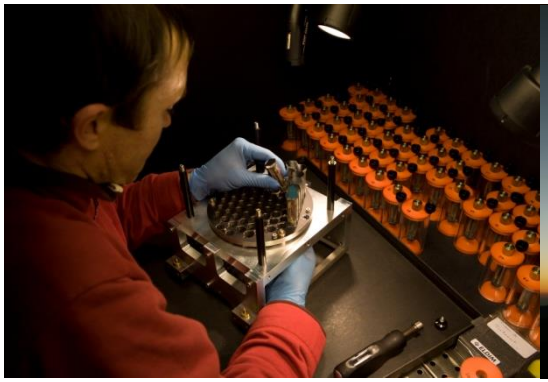
- Astronomy benefits from *and* drives advances in telescopes / instruments
- It is now possible to
  - Study objects over 95% of the age of the Universe
  - Detect and study planets around other stars
  - Use particles to study objects in the Universe
  - Explore Solar system objects in situ
- And also to
  - Simulate astrophysical processes
  - Analyze large data streams

Answers to some (big) questions...
➔ Require (big) facilities ...



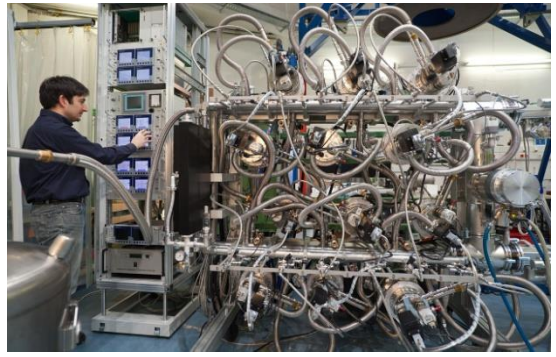


… and very talented people

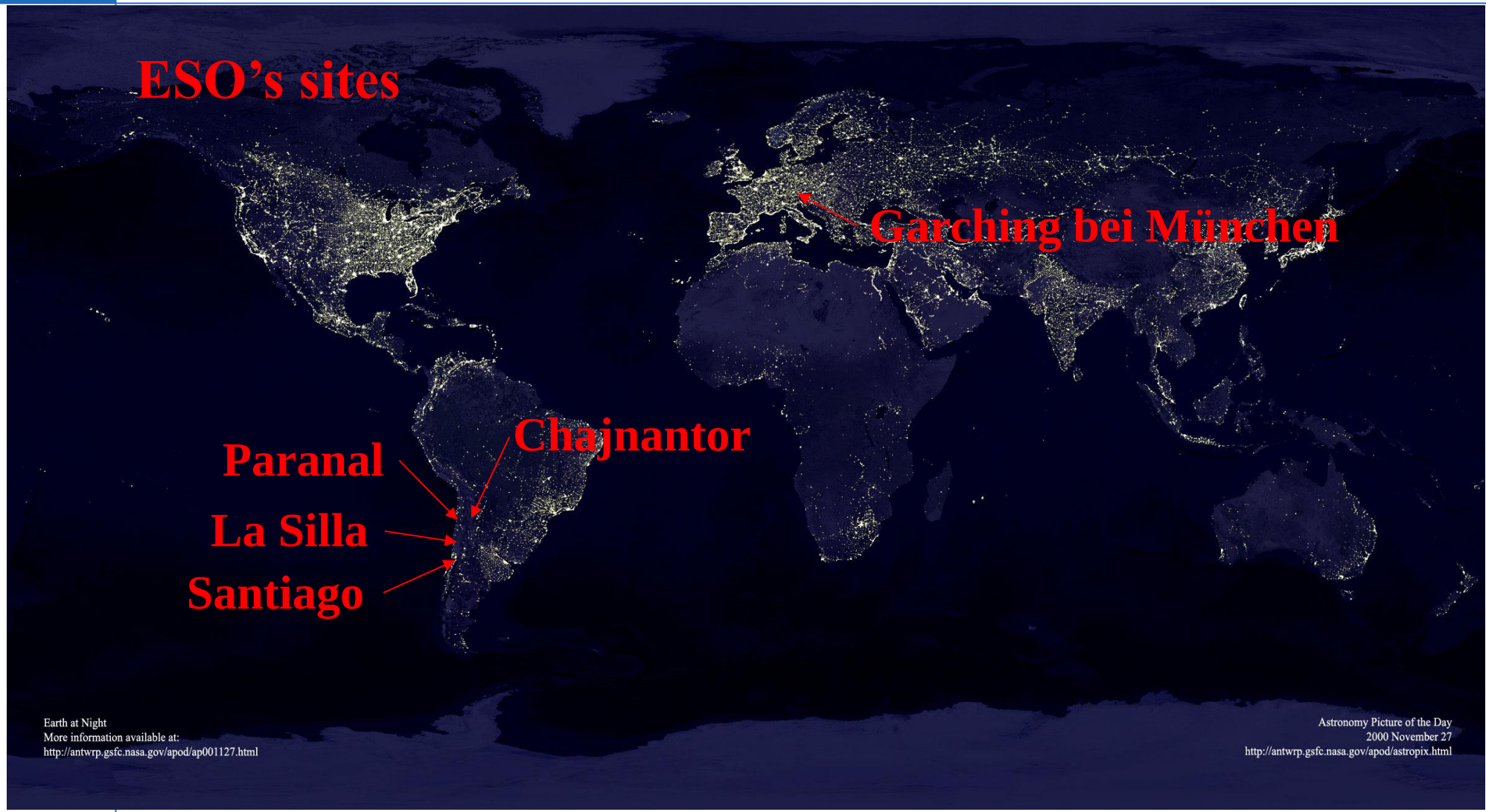




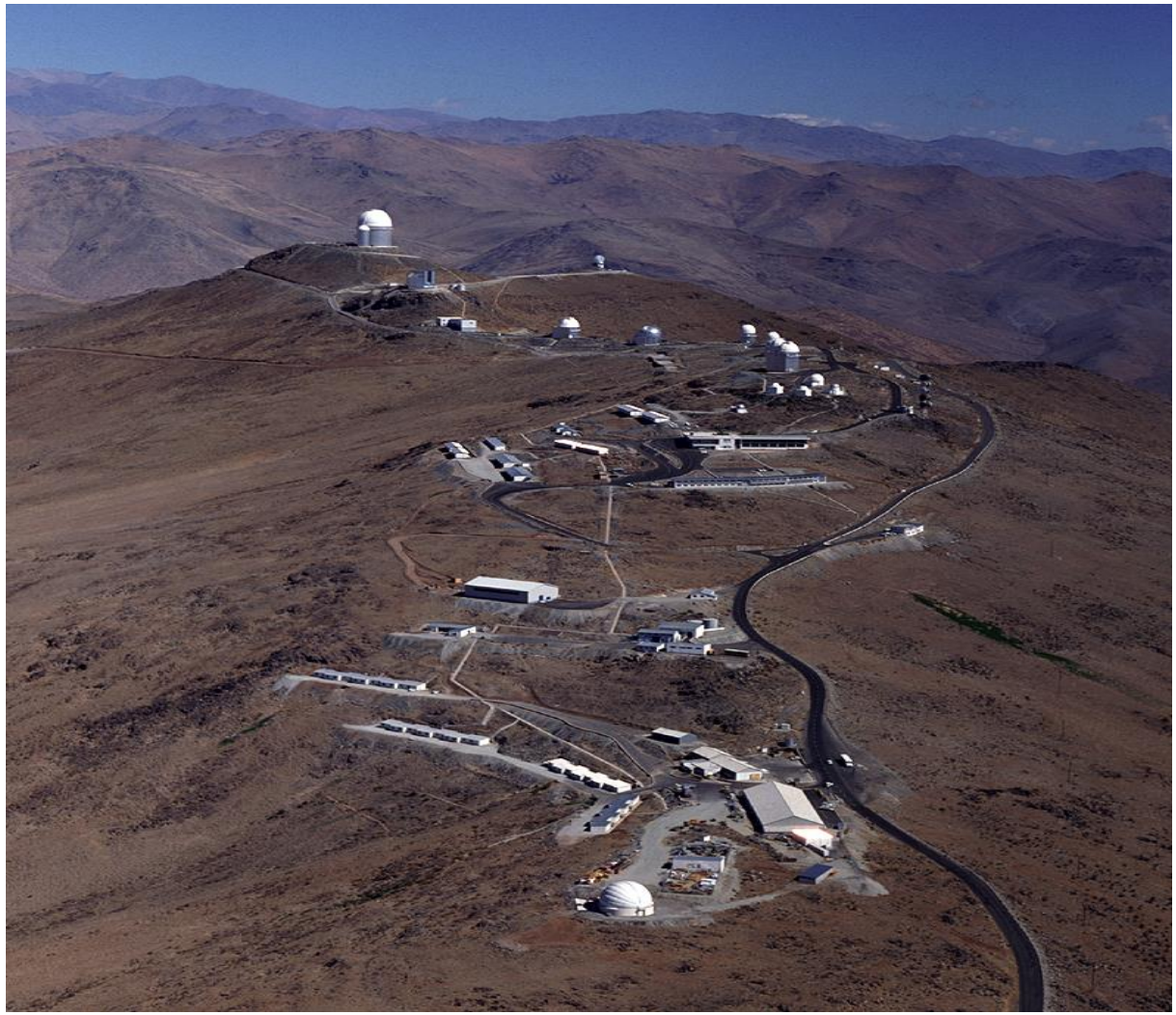





ESO's world


ESO's sites
Garching bei München
Chajnantor
Paranal
La Silla
Santiago
Earth at Night
More information available at:
http://antwrp.gsfc.nasa.gov/apod/ap001127.html
Astronomy Picture of the Day
2000 November 27
http://antwrp.gsfc.nasa.gov/apod/astropix.html

La Silla (Chile)



Paranal

Very Large Telescope - Paranal

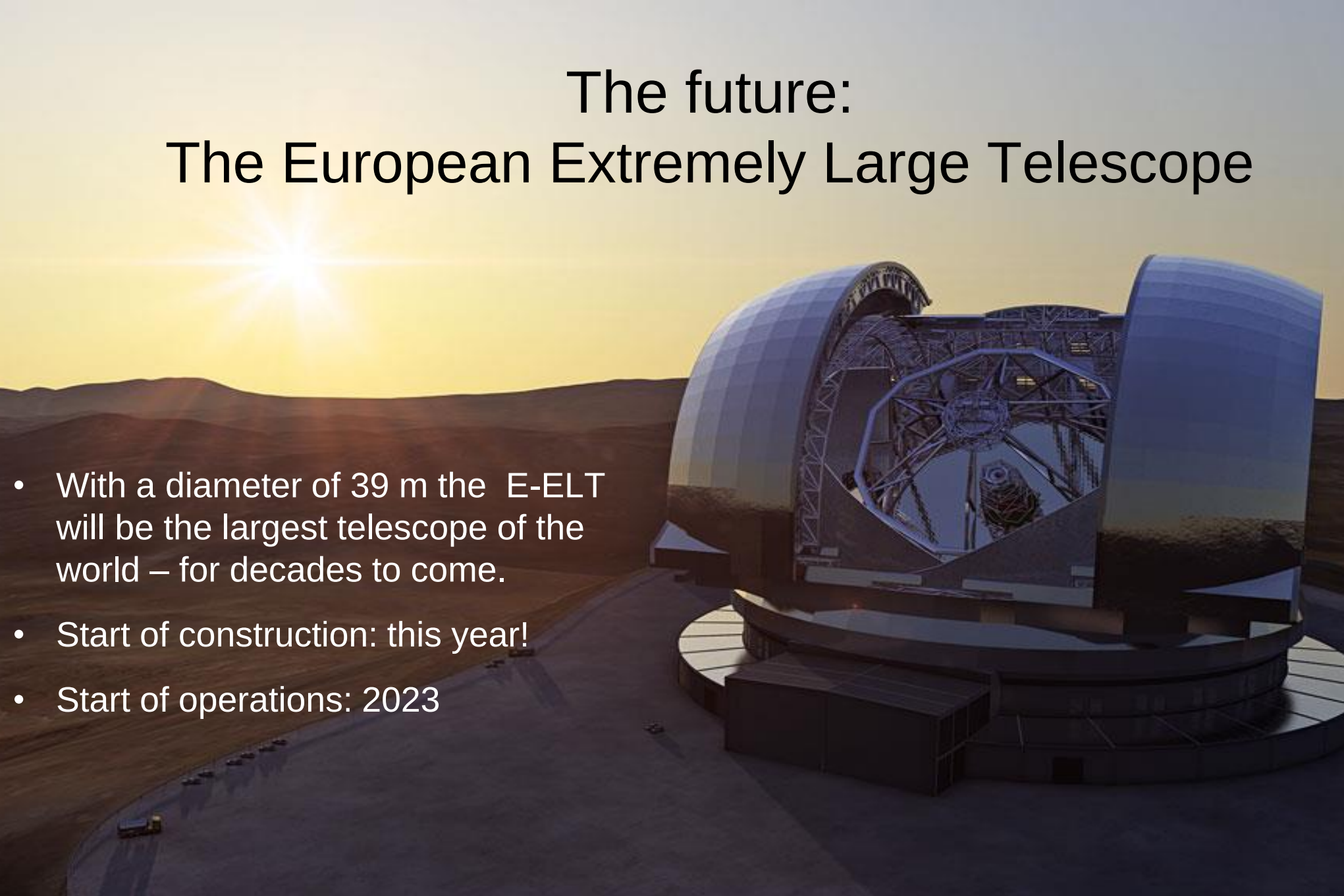
ALMA - Observing Support Facility


The Chajnantor plateau at 5000m


Lore
SCHEUERLE


Armazones
Paranal

The future:
The European Extremely Large Telescope



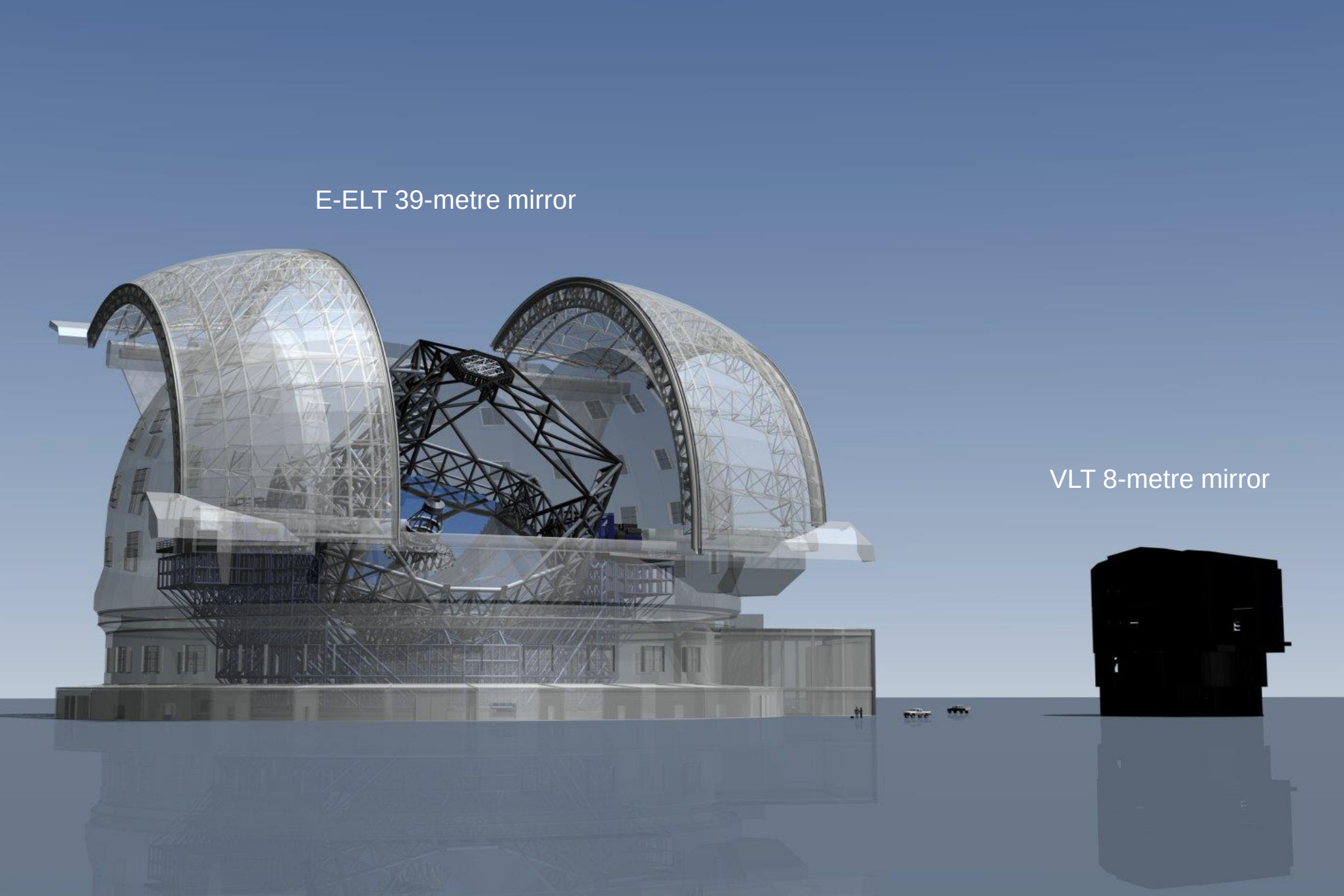
- With a diameter of 39 m the E-ELT will be the largest telescope of the world – for decades to come.
- Start of construction: this year!
- Start of operations: 2023

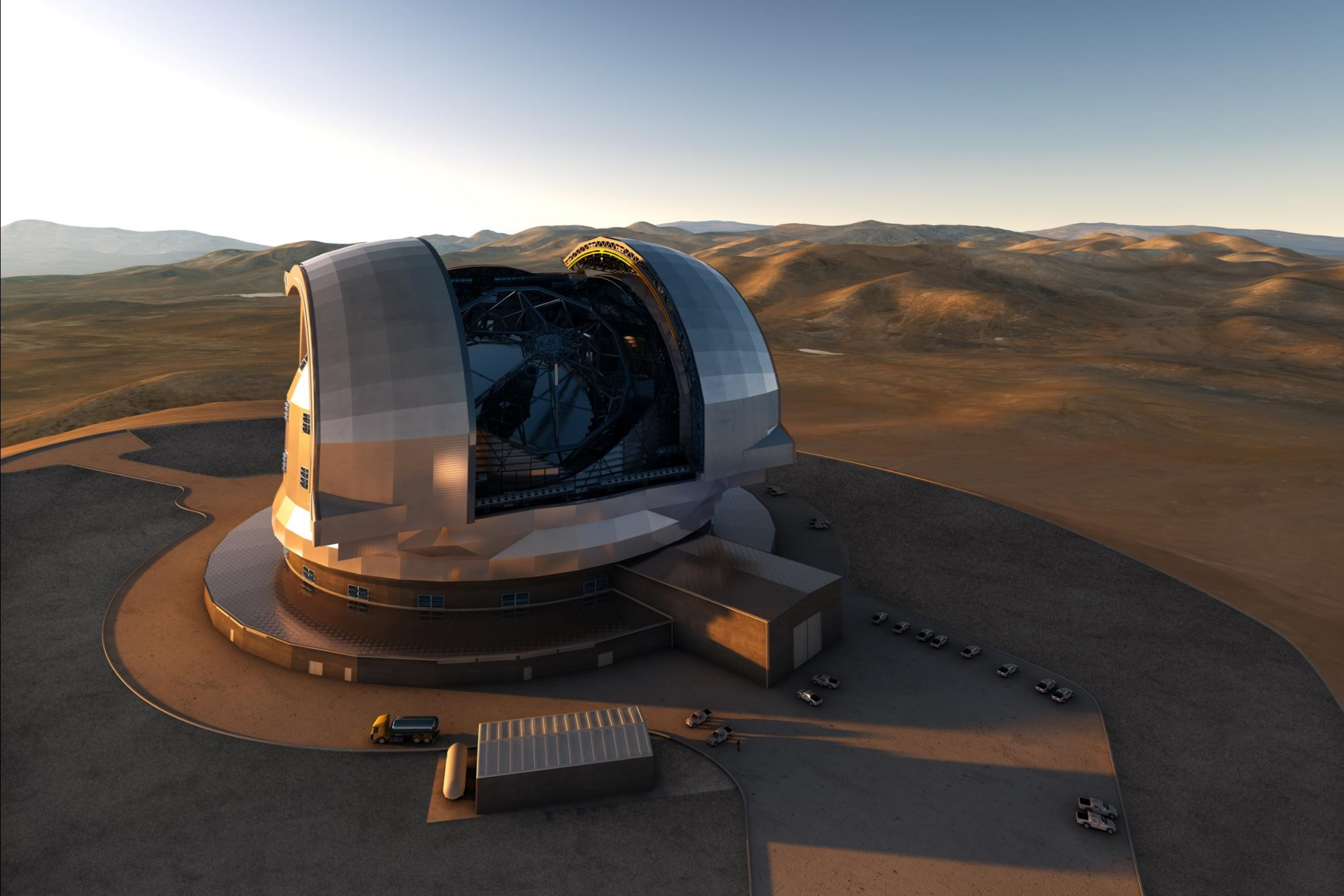
E-ELT is incredible…

- ***The science to be done with the E-ELT is extremely exciting***
  - extrasolar planets and discs,
  - galaxy formation,
  - dark energy/dark matter
    and frontiers of physics.

- The E-ELT is the largest optical/near-infrared telescope in the world***: "the biggest eye on the sky".***

- E-ELT will gather 15 times more light than any other optical/NIR telescope today.


E-ELT 39-metre mirror
VLT 8-metre mirror



The European Southern Observatory

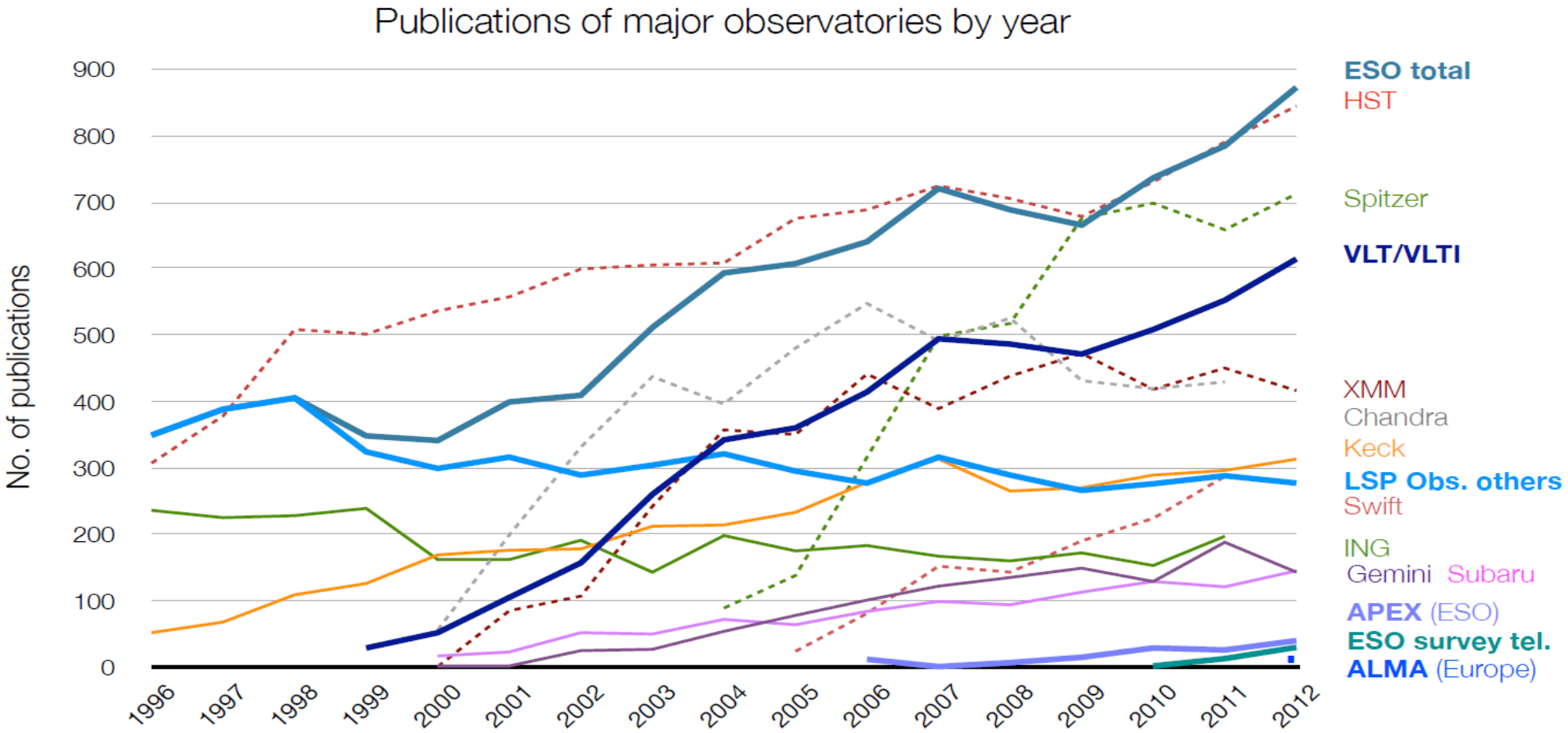
- **Mission**
  - Develop and operate world-class observing facilities for astronomical research.
  - Organize collaborations in astronomy.
    - Meetings, publications, large data archives
    - Fellowship and studentship programmes
    - Public outreach and education

ESO today

- **15 member states**, several others interested
- Collaborations with Chile, US, East Asia, Canada

  ➔ a global world
- ~ 680 (630) staff at 5 main sites
- ESO is the driving force behind ground-based astronomy, and the foremost intergovernmental astronomy organisation in the world.
- ESO is *the most productive observatory in the world* (871 refereed academic papers in 2012, Hubble 844).

Scientific Productivity



http://www.eso.org/sci/libraries/edocs/ESO/ESOstats.pdf

ESO offices

Santiago / Garching

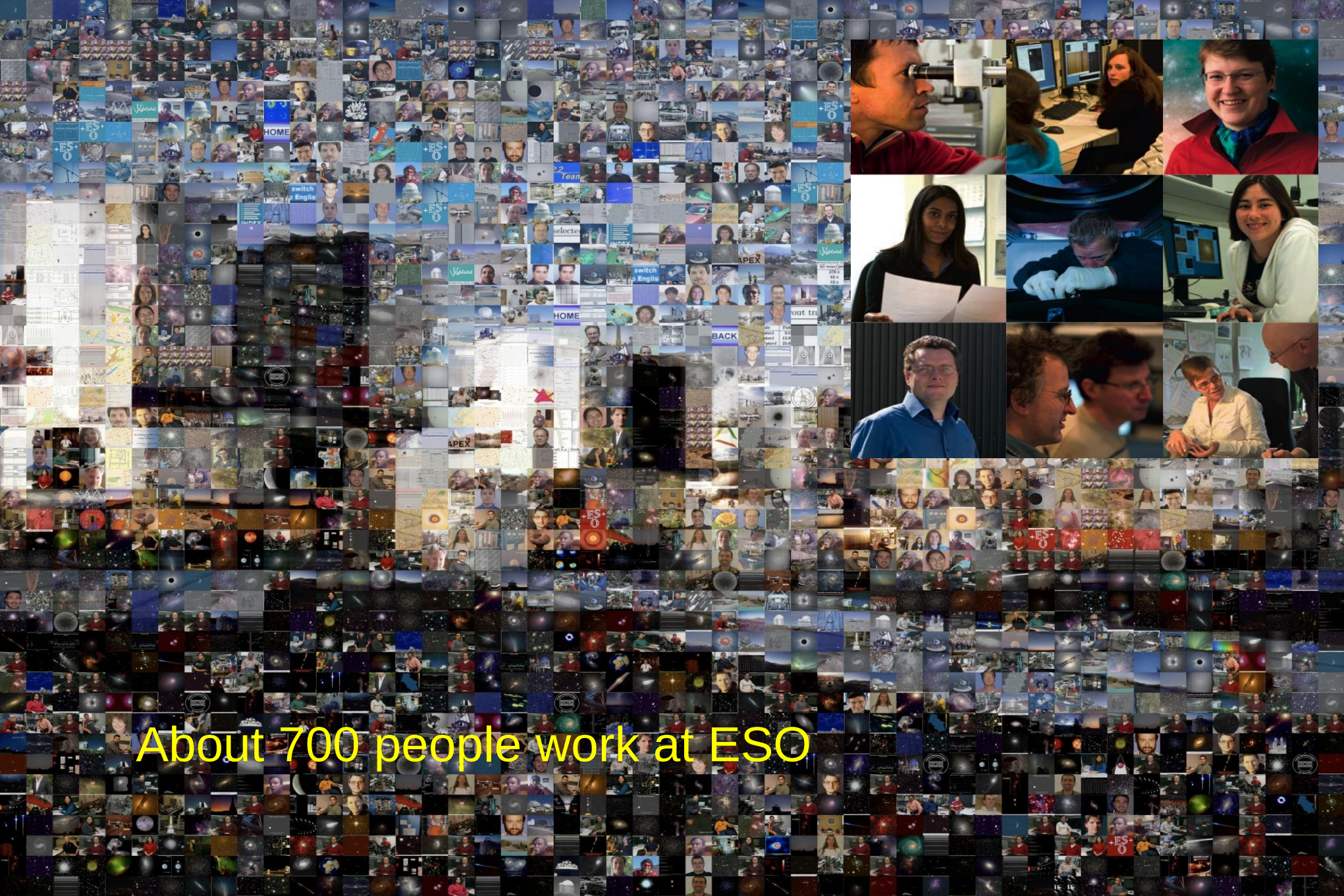
ESO Headquarters in 2014

And the next step is…

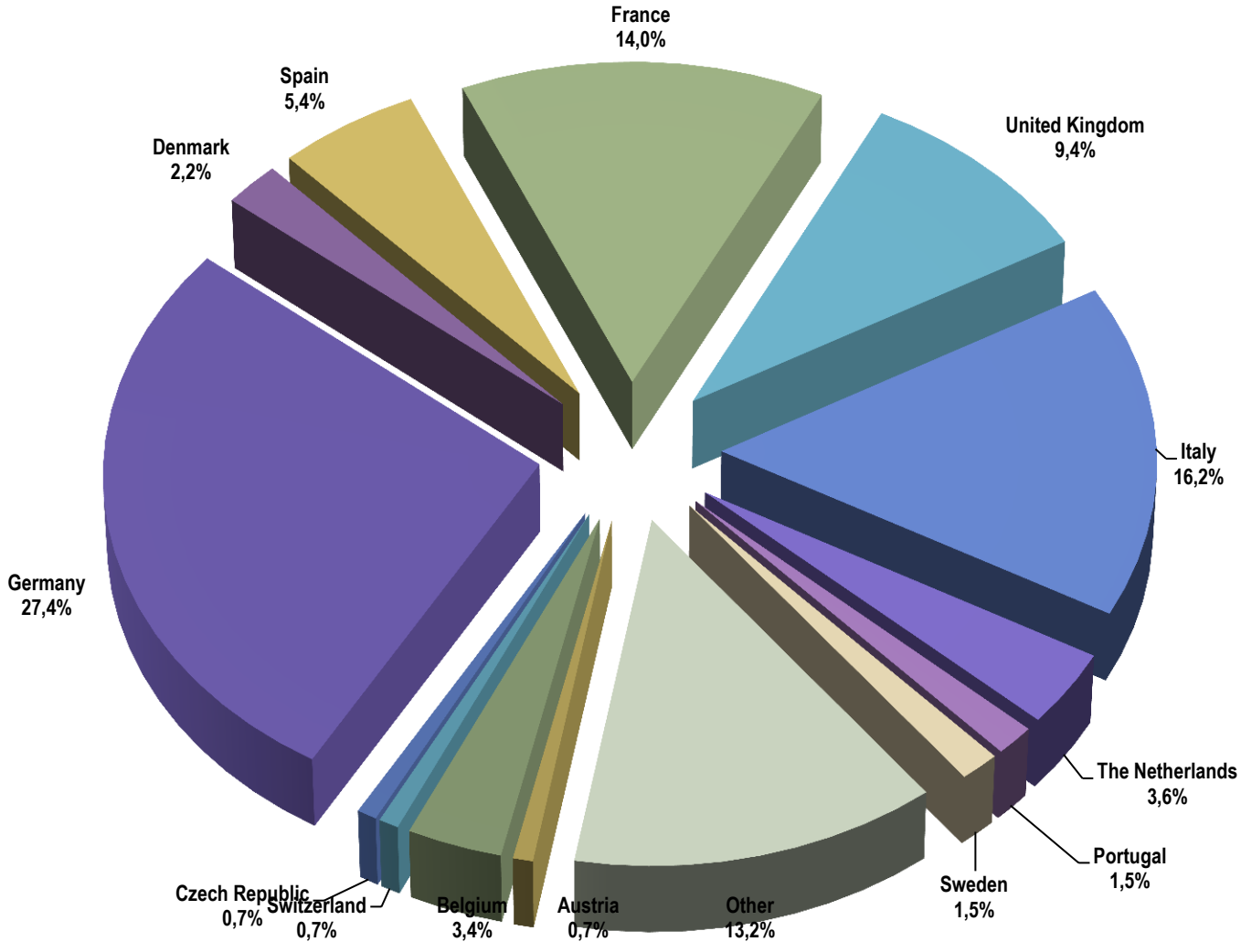
- Donation offered by the *Klaus Tschira* Stiftung
- Stunning building conceived by Klaus Tschira with Bernhardt + Partner

ESO Santiago

ESO Santiago


About 700 people work at ESO

Staff Members by Nationality



What are the opportunities?

Internships

International Appointments

What type of jobs?

Engineer

- Software Engineer
- Optical Engineer
- APEX – Senior Engineer
- VLTI System Engineer
- Operations Engineer
- Instrument Engineer
- Mechanical Engineer

Technician

- Mechanical Technician
- Electronics Technician
- Software Technician
- etc

Admin

- Finance
- Human resources
- Legal affairs
- etc

What type of jobs?

Astronomer/Scientist

- Outreach Scientist
- Instrument Scientist
- Applied Scientist
- Astronomer
- User Support Astronomer
- Operations Astronomer
- PhD Student
- Intern
- Post-doctorate Fellows

2 Offices for Science at ESO

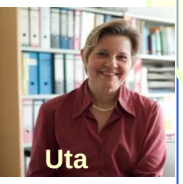
Mission

- ★ **Maintain an attractive/stimulating research environment**
- ★ **Disseminate ESO expertise into the community**
- ★ **Foster scientific collaborations**
- ★ **Keep ESO Astronomers at the forefront of Astronomy**
- ★ **Educate, Train Students and Junior Astronomers**

We are there to help

> 190 Science Staff + ESO community

Offices for Science – Vitacura/Garching



Programmes
Workshops, Visitors,
Studentship, Fellowship,
Internship

Environment
Seminars, Discussions,
Visitors, Library,
Garching Campus, Santiago's
Institutes, Observatory

People
Faculty, Scientists
Fellows, Students
Interns, Visitors

Offices

Facilities
Observatories
Desks, Hardware, Software,
Information Centre (library)

Processes
Recruitment,
Monitoring, Evaluation,
Training, Development

Science Staff @ ESO

- ~80 Faculty + 30 Scientists
- ~45 Fellows
- ~35 Students (including about 7 from IMPRS)
- 1-4 Interns
- > 35 long-term Visitors/yr + many short terms



















Science done by ESO Astronomers

- ESO staff ➔ a wide variety of research topics, broadly divided into five areas with ample overlap
  - Planets and Star Formation
  - Stellar Structure and Evolution
  - Stellar Populations
  - Evolution of Galaxies and the ISM
  - Cosmology and the Early Universe

Scientific Life @ ESO

- 4-8 conferences a year hosted @ ESO (Chile/Germany)

+ a few sponsored events

- Lively seminar schedule
  - Munich Joint Astronomy Colloquium
  - Journal Club + Lunch Talks
  - Informal Discussion (whiteboard talks)
  - Wine & Cheese
  - Flash Mob Science

  + many other informal seminars (star formation, AGN, cosmology, ...)

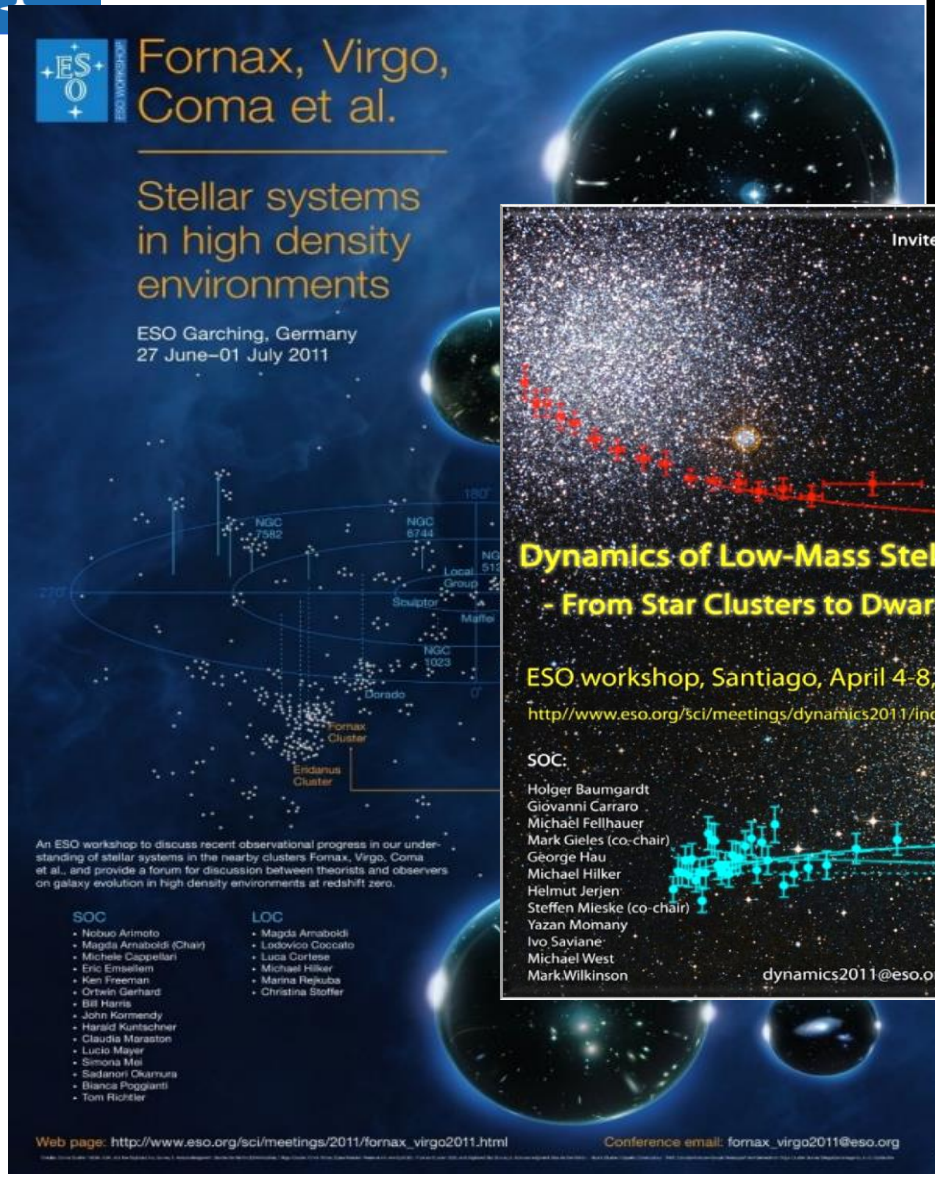
- Many interactions with neighbouring institutes

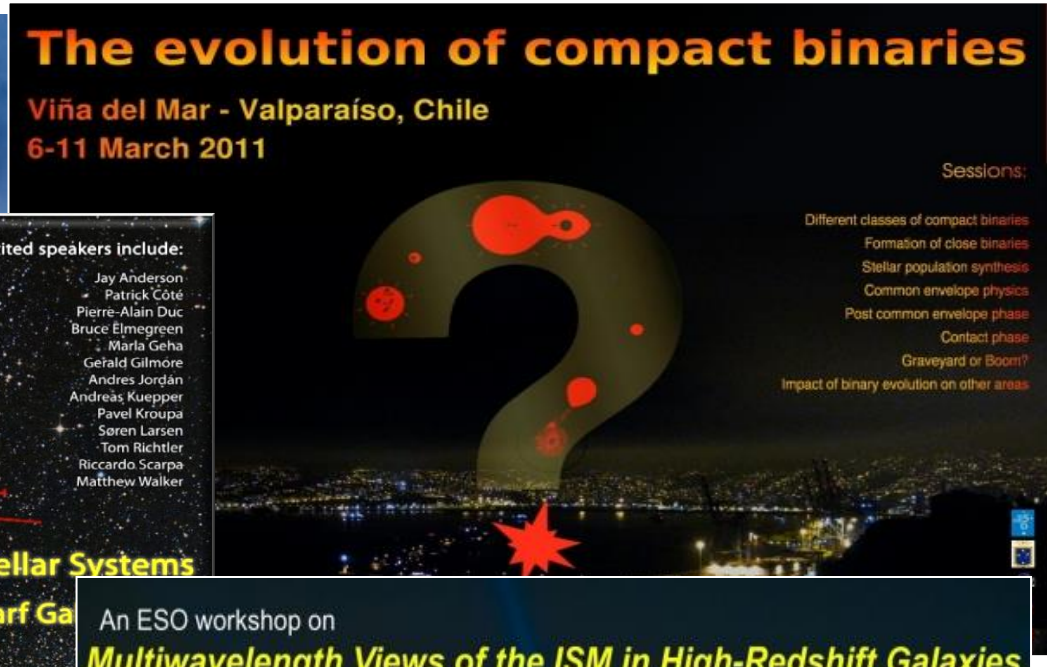
Garching

Vitacura

Meetings

ESO Workshops Programme





ESO Workshop Programme

- Internal Selection of a few workshops per year
- Contact ESO staff to trigger potential ideas for workshops which could benefit the ESO community

ESO Visitor Programme

- ESO welcomes
  - **short** (< 4 weeks) and **long**-term visits
  - by astronomers from around the world

➔ ESO Contact person + contribution to science life

- Visitor applications ***can be submitted any time***

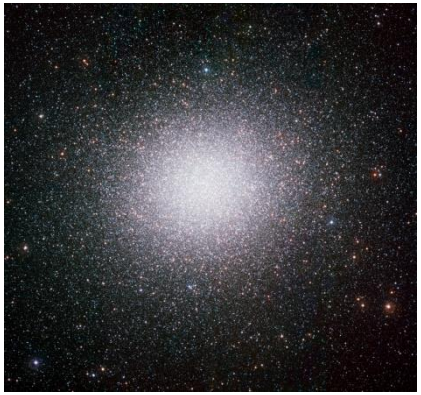
ESO Visitor Programme

- **Short**-term visitors:
  - < 4 weeks
  - Via the Heads of the Offices
- Long-term visitors
  - 1 to 6 months (typically 2 months)
  - Selection via a science committee

➔ See ESO Web

Internship Programme

- Masters or Undergrads students
- Strictly limited to ESO member States
- Anytime during the year, typically 3 months
- Work on a science project
  - formal supervision at ESO by Astronomer
- Allowance and support (trip, lodging)
- *No advert: pls contact Staff at ESO*



Studentship Programme

- Open to students enrolled in a PhD
- All nationalities, *preference to ESO Member States*
- **Duration**: 1 or 2 yrs (out of 3)
- Start ~ between August & December in the year which they are awarded
- Ad in March, deadline June 15
- Work on your doctoral project
  - formal supervision of your home University
  - Co-supervised by an ESO staff astronomer
- Chile – Volunteer up to 40 days/nights per year at La Silla Paranal

Choosing ESO for your PhD

- ESO's PhD topics are both observational or about modelling :
  ➔ excellent chance you will work with real (multi-wavelength) data and will be involved with observations.
- *Excellent travel support* for conferences and observing runs.
- Great *team spirit* among student + postdoc + ... at ESO.
- *Fantastic environment*
  - Garching Campus, Chilean institutes
  - LRZ, Excellence Cluster (Germany)
  - Observatory : La Silla, Paranal, APEX/ALMA (Chile)
- And ESO welcomes initiatives from students (and fellows)

Choosing ESO for your PhD

- It requires you to be enrolled in a PhD programme

- You need to prepare your application well in advance
- *Requires close contact with an ESO Faculty member*
- And it requires a solid PhD project

  + Scientific excellence

Deadline = June 15

PhD topics: http://www.eso.org/sci/activities/thesis-topics.html

ESO Fellowship Programme

- Core mission
  - *To educate and prepare the next generation of astronomers* by giving them the opportunity to work in a unique environment where they can consolidate their scientific career and visibility, as well as get an in-depth experience with state-of-art facilities.

- Goal
  - Bring the fellows to the next step of their career

ESO Fellowship Programme

- Open to all nationalities, but preference to ESO member countries
- **3 years** in Garching or **3+1** in Chile
- **Chile Fellows** do research plus observatory work
- **Garching Fellows** do research plus support work
- Deadline for applications is *October 15th*

Fellowship Programme - Germany

- Join ESO after you have achieved PhD
- Application Deadline October 15
- Start ~ September – December in the year which they are awarded
- Contract: 3 years (1+2)
- 25% (Germany) of time spent on support/development activities:
  - Instrumentation, Operations Support
  - Archive/Virtual Observatory
  - VLTI/ALMA/ELT
  - Science Operations at the Observatory (Chile)
  - Public Affairs

Fellowship Programme - Chile

- Join ESO after you have achieved PhD
- Application Deadline October 15
- Start ~ September – December in the year which they are awarded
- Contract: **4 years (1+2+1)**
- 80 nights assigned to one of the following groups, then in Santiago's Office:
  - Paranal
  - La Silla
  - APEX/ALMA
- Within year 4, no functional work

Fellowship Questionnaire

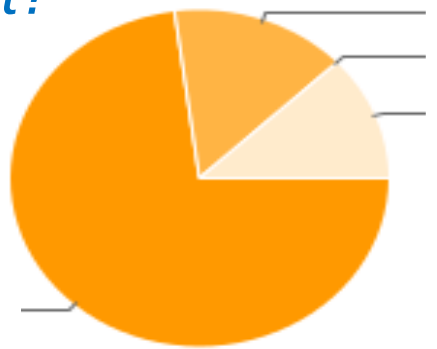

Summary of Fellows Questionnaire

ESO Offices for Science

- Survey of 222 ESO Fellows (174 replies = 78%)

➔ strengths/weaknesses of ESO's Fellowship programme

With hindsight, how important was your ESO Fellowship for your career development?



14% moderately important

0% unimportant

20% not sure or too early to say

70% very important

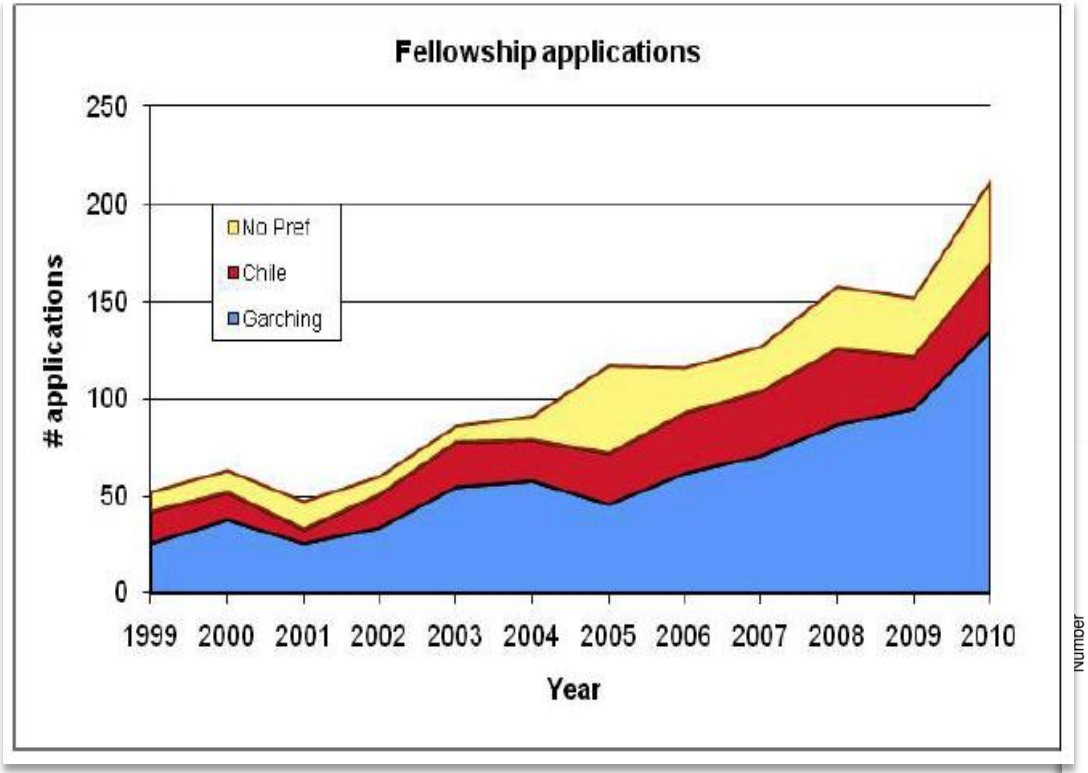
Bottom line

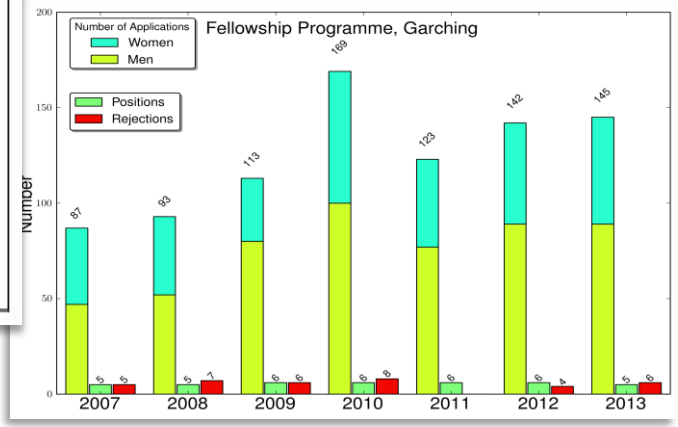
ESO's Fellowship programme has been very successful in serving the needs of ESO's community

- 87% of Fellows from 2000 or before have permanent jobs in astronomy or related field today

Fellows: the next generation of ESO users!

- Increasing pressure, competitive process



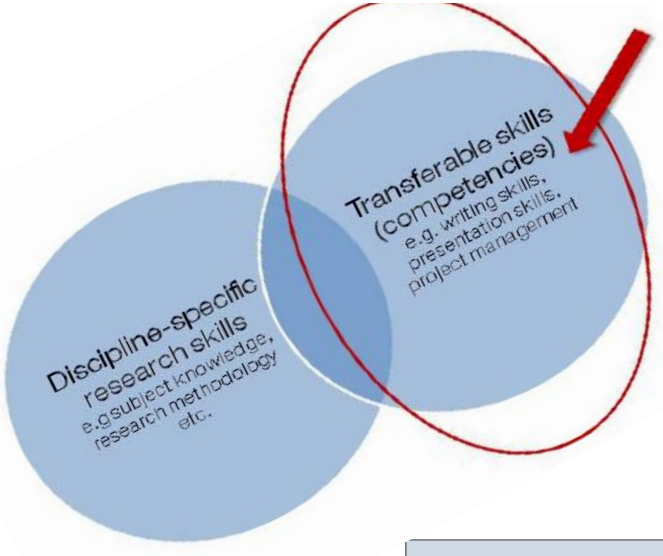


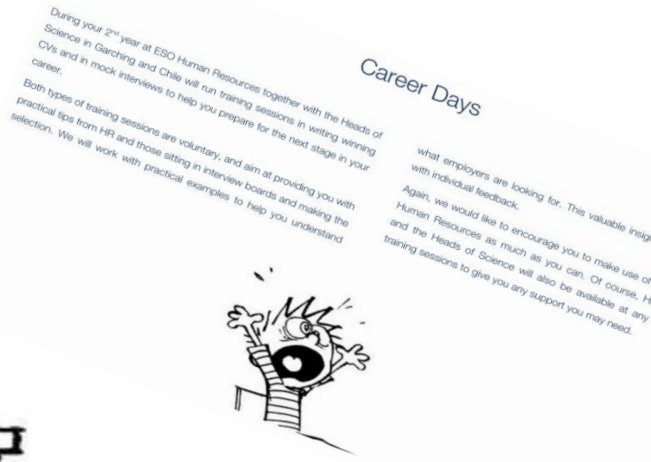
Fellowship Applications

- Selection criteria
  - *No excluded research topic*
  - Science excellence
  - Independence
  - Science excellence

  - **And Why ESO ?**

ESO Fellows Development Programme





Year 1

Year 1			Year 2	
Module 1	Project Management	Formal programme	Module 4	Effective Networking
Module 2	Scientific Writing		Module 5	People Skills
Module 3	Presentation Skills		Module 6	Career Coaching
		Career Days	Voluntary	Creating Winning CVs and Cover Letters
			Voluntary	Interview Skills

Year 2

Hosting Fellows at ESO

- **Humboldt fellows**
- **Marie Curie Individual Fellowships**
  - **FP7 + Horizon 2020)**
  - **1 position in 2012, 1 in 2013**
  - **2013 round**: 5 proposals
- **Potential ERC grants**

- ESO can also host externally funded students

➔ <u>In all cases</u>: science excellence is a must

Staff astronomers at ESO

- In Garching work on instrument development, user support, etc.
- In Chile spend 105 or 135 nights per year working at the observatory
- All ESO astronomers do research

Qualifications/Experience

- Ph. D. in Astronomy, Physics, Astrophysics or equivalent

- Programming qualifications/significant experience
- **English**: proficiency in oral + written communication
- Working together/team working

- Project experience
- Management experience can be a plus

- **PASSION!**

Skills

- Team spirit
- Self dependent
- Good communication
- Conflict management
- (Inter-) cultural empathy
- Emotional intelligence

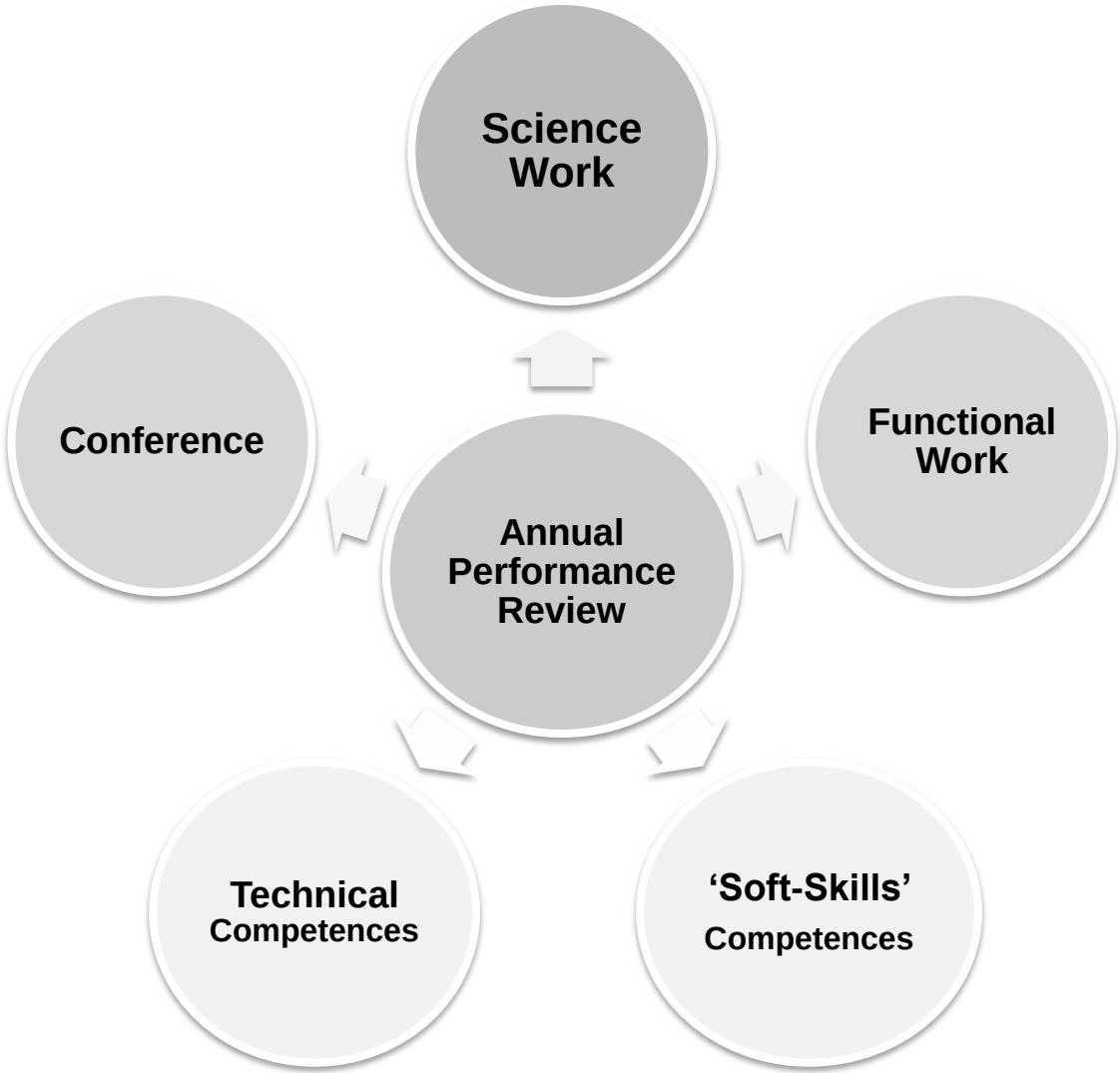
- **PASSION !**

Conditions of Employment

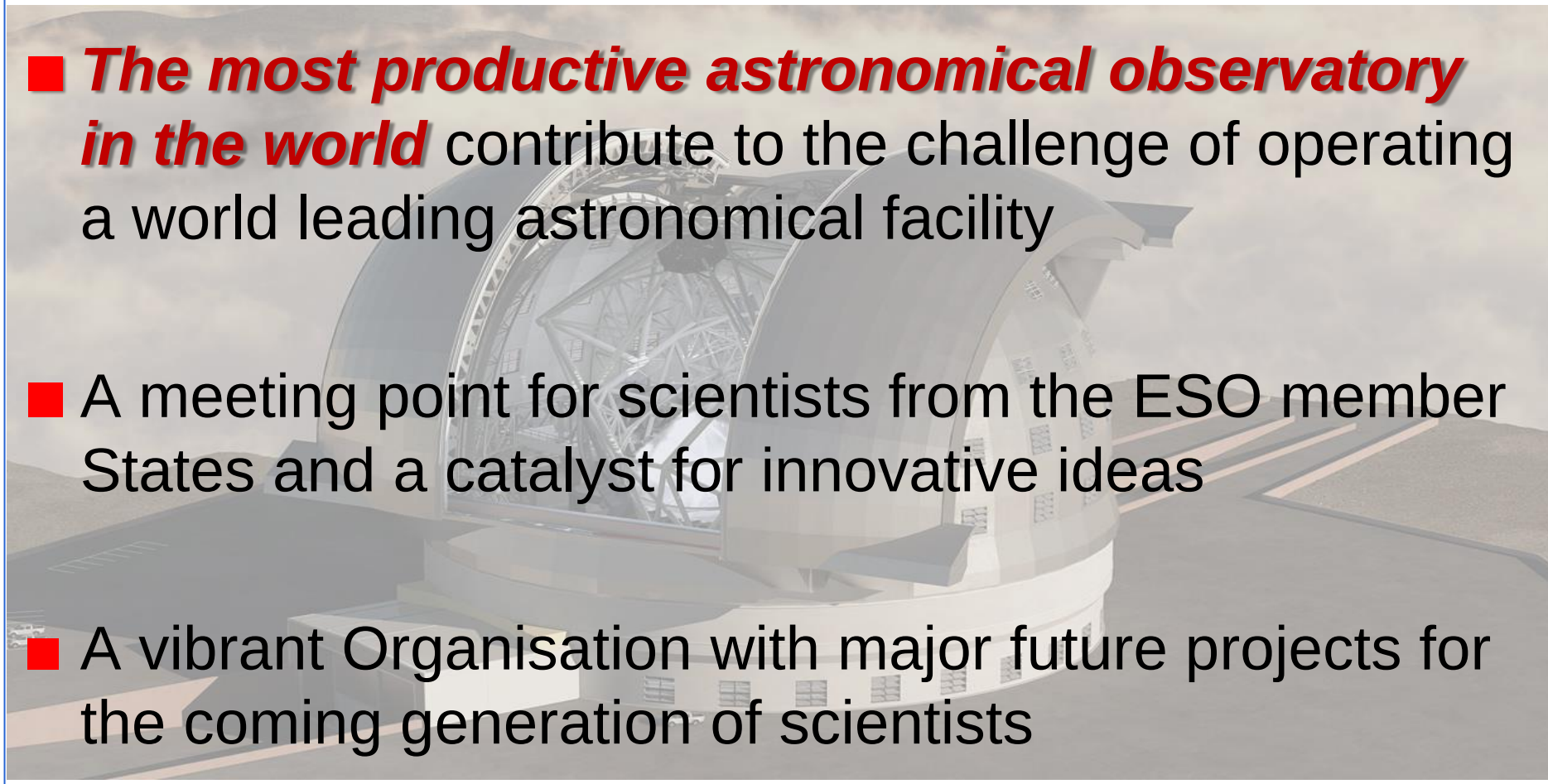
International Staff

- Benefits
  - Home Leave
  - Relocation Allowance/Support
  - Expatriation Allowance
  - Cost of Living Adjustment
  - Education Grant
  - Parental/Paternity Leave
  - Children’s Allowance
  - Kinderkrippe
  - Kindergarten
  - Flexible Working

Staff Development: one example

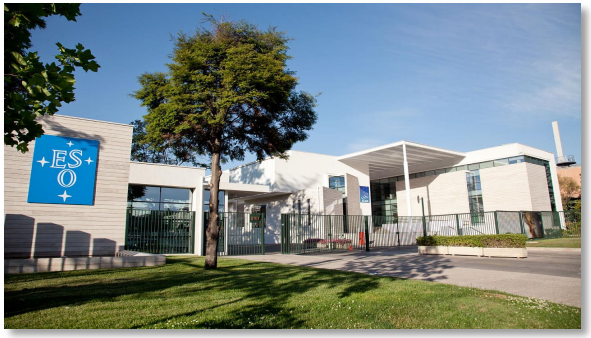


What this means for you ...



- ***The most productive astronomical observatory in the world*** contribute to the challenge of operating a world leading astronomical facility
- A meeting point for scientists from the ESO member States and a catalyst for innovative ideas
- A vibrant Organisation with major future projects for the coming generation of scientists

Fellowship programme



Internship programme

➔ *Come to work at ESO!*

Studentship programme

Visitor programme

Workshops, meetings

Questions ?

eric.emsellem@eso.org