

**HIGHLIGHTS OF THE
PORTUGUESE TRAINEESHIP
PROGRAMME AT
CERN, ESA AND ESO**

FCT

Fundação para a Ciência e a Tecnologia
MINISTÉRIO DA EDUCAÇÃO E CIÊNCIA



HIGHLIGHTS OF THE PORTUGUESE TRAINEESHIP PROGRAMME AT CERN, ESA AND ESO

Fundação para a Ciência e a Tecnologia (FCT) is the national funding agency for science and research in Portugal.

FCT promotes internationally competitive and high impact science, technology and innovation across all areas of knowledge, including exact, natural and health sciences, engineering, social sciences and humanities.

Portugal is a Member State of CERN, ESA and ESO, and FCT is responsible for managing funding and liaison with the national scientific and industrial communities.

To ensure there is a positive return on investment for Portugal in these organisations, FCT has set up protocols for advanced training for young Portuguese graduates. The Traineeship programme at CERN, ESA and ESO encompasses a one-year long internship in several technological domains with the possibility of renewal for one further year.

The programme is a unique opportunity for young graduates to get a hands-on and real life experience working in strategic technological domains that may contribute to the world's most significant scientific advancements. At the end of the two years internship period at these organisations, FCT expects that the trainees return to Portugal and contribute to the competitiveness of the national innovation ecosystem, in particular industry, where they can aim to be future leaders in key reference companies and ultimately impacting the economy and society at large.

PORTUGUESE TRAINEESHIP PROGRAMME AT CERN, ESA AND ESO

CONTACT estagiostecnologicos@fct.pt

MESSAGE FROM THE PRESIDENT OF FCT

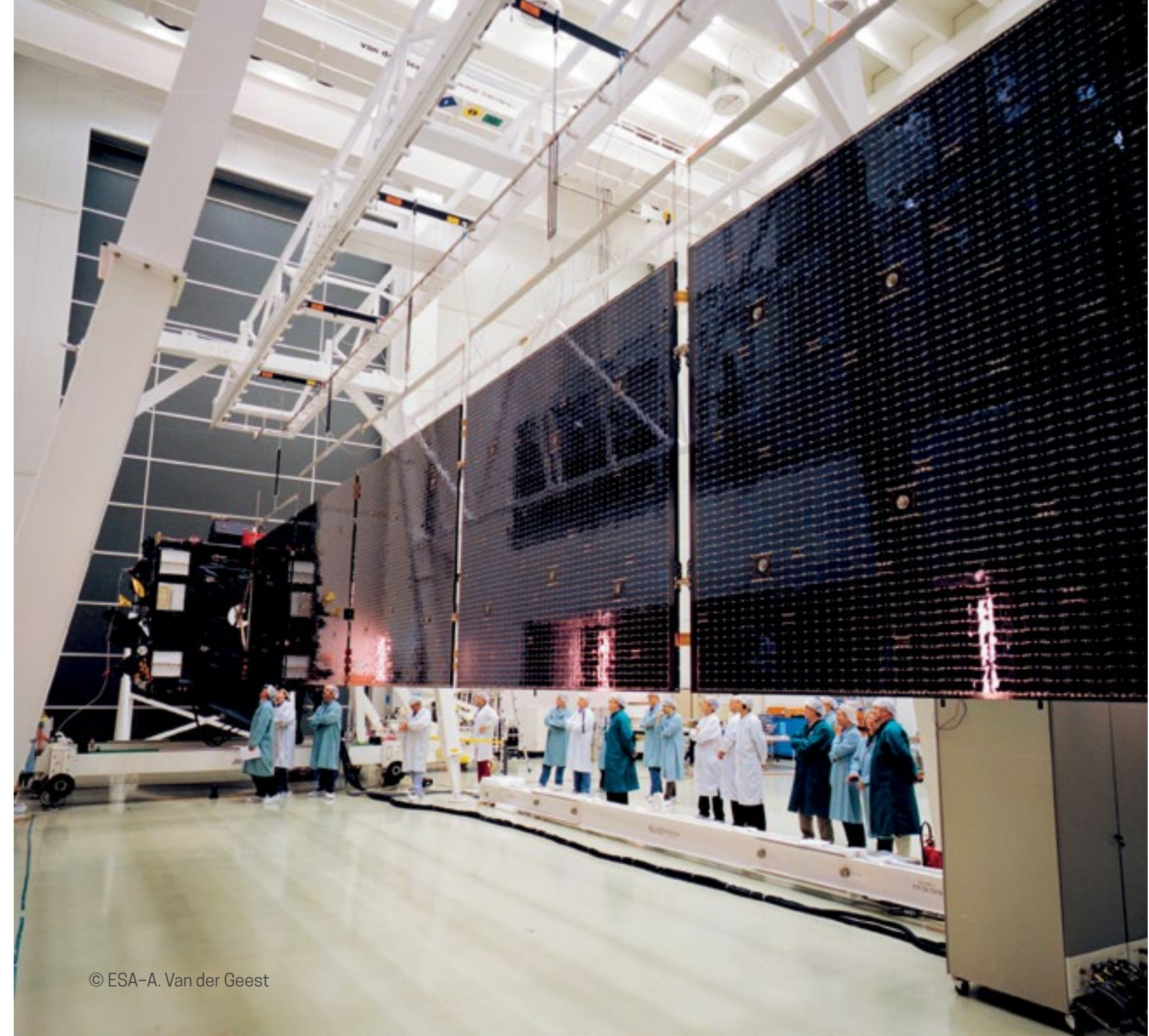
The Portuguese Traineeship Programme at CERN, ESA and ESO, funded by FCT, was established in 1996. Since its creation, the Programme has given more than 300 young Portuguese graduates, mostly with a scientific or an engineering background, the opportunity to develop on-the-job technological and managerial training at three of the world's leading international scientific organisations.

FCT's goal is that, through this Programme, all trainees gain the necessary skills to pursue successful careers both in Portugal and abroad, in industry or in academia, through the creation of new companies or as contracted staff at the host organisations. This goal has clearly been achieved (as this brochure shows), thanks to the dedication of all involved in setting up and maintaining the programme. A special acknowledgement is due to the international organisations – CERN, ESA and ESO – for their clear interest and support for the programme over the years, evident in the many training opportunities provided for each call.

In line with FCT's vision to establish Portugal as a global reference for science, research and innovation, and with the European and international challenges facing science and technology, FCT wishes to reinforce its commitment to the Traineeship Programme at CERN, ESA and ESO. Indeed, the Programme provides a unique opportunity for the best graduates to gain international experience and then give back to Portugal the benefits of their training, thus helping the country mark its scientific and technological footprint in the international scene.

MARIA ARMÉNIA CARRONDO

President



MESSAGES FROM PORTUGUESE DELEGATES

Launched some twenty years ago by the former Agência de Inovação (AdI) and funded by the Fundação para a Ciência e a Tecnologia (FCT), the Portuguese Traineeship Programme at CERN, ESA and ESO started at CERN and was later extended to ESA and ESO. Today the Programme is directly run by FCT.

Every year the programme selects young engineers to spend a year or, for the majority, two years at the International Organisations. Only the very best students of the Portuguese Engineering schools have a chance to be selected.

The number of young engineers that have followed the Programme is now well over 300.

The selection implies that the trainees will be trained to perform an advanced technical job under direct supervision of a senior supervisor. A large spectrum of job descriptions is provided yearly by the international organisations, covering virtually all fields of advanced engineering, from instrumentation and materials science to superconducting and space technologies.

During their training, the selected engineers are monitored by a team based at FCT and their progress is evaluated yearly at an informal workshop with their supervisors.

The success of the Programme could be evaluated by the fact that the failure rate is very close to zero and the professional follow up for the trainees is granted in 100% of the cases.

These trainees will, in fact, soon become employed either in Portugal or abroad, in the industrial and services universe of technologically advanced companies, or they return to Academia for a PhD degree. Particularly relevant is the fact that many of them are promoted to the staff of the International organisations or, in a few cases, start their own companies.

The FCT programme is one, if not the first, of the more relevant advanced training programmes in international scientific organisations. It promotes the international recognition of the competence of our engineers and helps to insert Portuguese senior staff in the most prestigious international institutions, well beyond what could be expected for a small country.

For the Portuguese industry these engineers behave like living carriers of technology transfer and add new highly valuable skills and competences.

FCT makes a continuous effort to follow their careers even after the conclusion of the training programme. In a regular way FCT tries to evaluate the programme and its impact on the professional world. This brochure aims to contribute to this assessment.

GASPAR BARREIRA

President of the Traineeship Programme Evaluation Panel and Portuguese Delegate to the CERN Council

As part of the Portuguese membership of ESA an internship programme has been in place since 1998 (it was initiated as a strategic action to prepare Portugal for full membership), mostly for engineering graduates, but also for graduates from other backgrounds. This scheme has opened a valuable opportunity for young graduates to gain a critical advantage in their career paths by spending between 12 to 24 months at ESA, to train “on the job”. The young trainees are placed according to their preferences, but also reflecting the critical areas in Portuguese industry and research networks where specialists are required and could secure a strategic advantage. This has led to an important impact on industry, and Portuguese competitiveness in general within ESA activities, due to the added value that such training represents for the companies receiving those professionals.

The programme is based on learning on the job, where the young trainee is placed within a team or department to participate in ongoing activities, or those in preparation, at ESA. This allows for direct and effective access to a work environment that is both very dynamic and international, but also extremely technical and at the forefront of what is done in space technologies. The trainee has thus a unique opportunity to acquire the necessary skills and insight to be able to participate in such a competitive field in one of the leading space agencies in the world, holding an impressive track record of successful missions, both in space sciences and also in ESA optional programmes.

The number of applications for these opportunities has been very high, reflecting the attractiveness and importance of this experience in building the careers of young engineers. They are well placed to lead in the space industry in Portugal and abroad, but also in other related areas of industry that have benefited from technology transfer initiatives. The very high quality of the graduates that are selected every year has been a very important factor in making this programme such a success. It has been the key factor in ensuring that the impact is maximised as we welcome back excellent professionals that are able to take full advantage of the opportunity made available to them at ESA.

MÁRIO JOÃO MONTEIRO

Portuguese Delegate to ESA’s Scientific Committee

The European Southern Observatory (ESO) is an intergovernmental organisation that builds and operates the most advanced telescopes in the world. By operating at the leading edge of today's technical knowledge in systems engineering, mechanics, electronics, optics and information systems and software it is a unique environment where young engineers can do on-the-job training. Although engineers with a PhD can apply for the traineeships, it should be underlined that the goal of the traineeships is on-the-job engineering and not research in engineering. Research activities are funded by other Fundação para a Ciência e a Tecnologia (FCT) funding mechanisms. The traineeship programme gives young engineers the possibility to work in a highly international environment, with offices in Germany and Chile, an obvious asset for a future career in engineering. This is fully demonstrated by the career profiles of the ESO trainees.

The number of ESO trainees is small when compared to those at CERN or ESA, partially reflecting the smaller scale of ESO with regards to the previous organisations. An effort should be made to give more visibility in Portugal to ESO and its activities. This effort should be an integrated one, by joining the research units and companies that have stronger ties to ESO with Portuguese "ESO Alumni". This integrated approach would maximise the national return of the Portuguese participation in ESO.

PAULO GARCIA

Portuguese Delegate to ESO's Scientific Committee





OVERVIEW OF THE TRAINEESHIP PROGRAMME

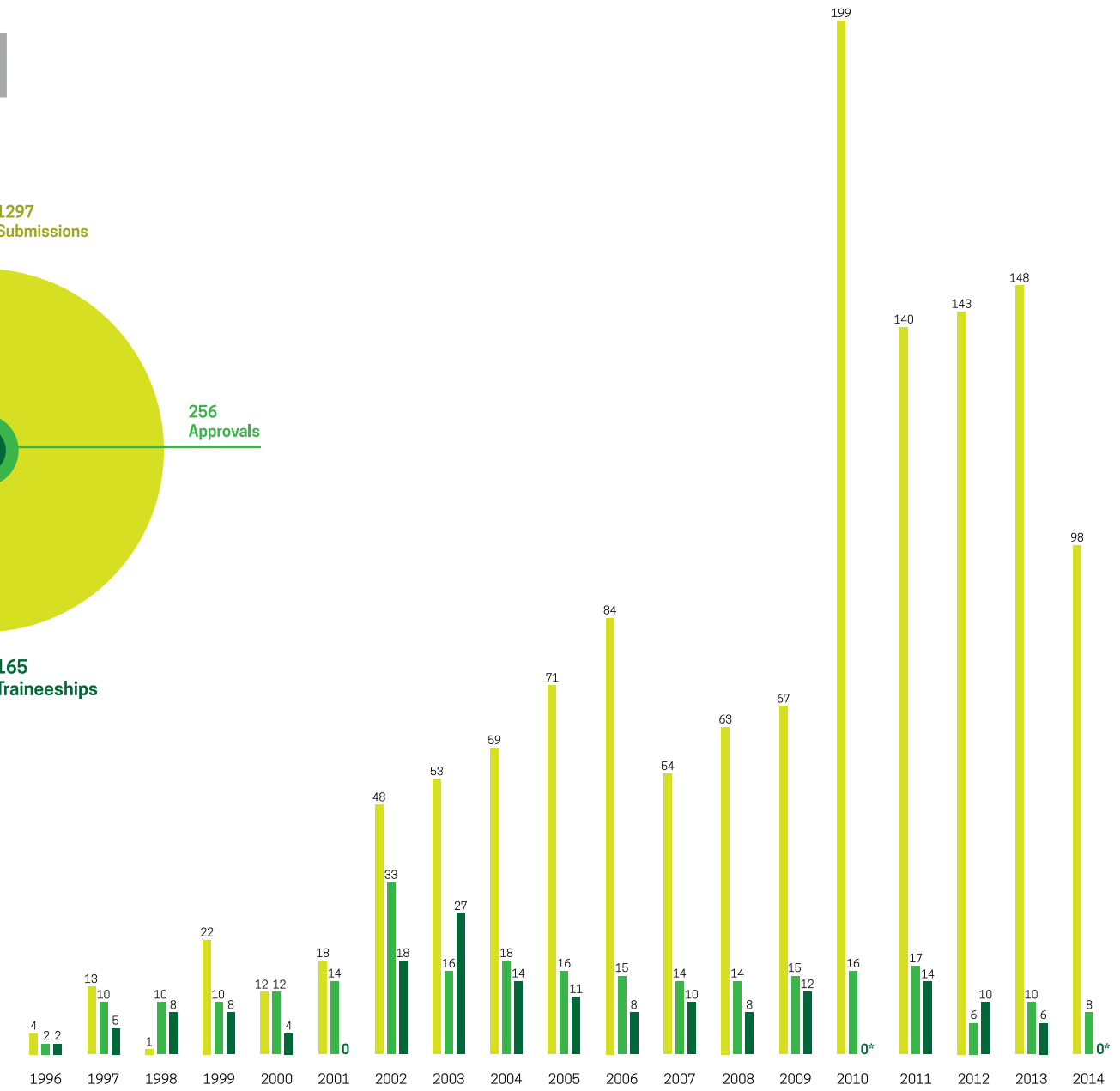
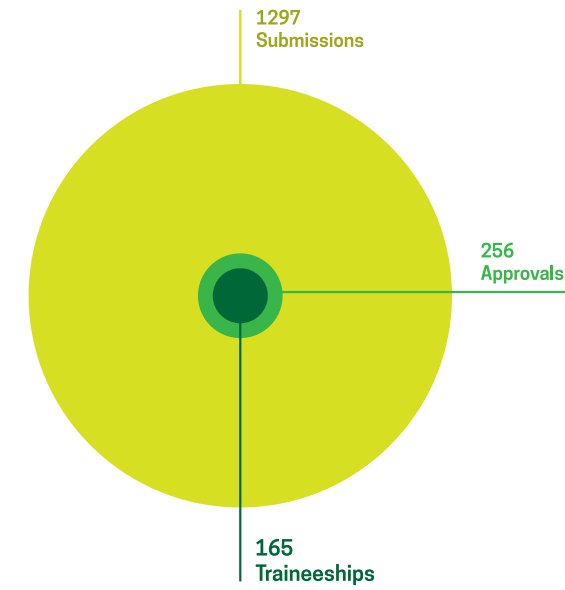
DISTRIBUTION OF APPLICATIONS

TOTAL NUMBER OF SUBMISSIONS

TOTAL NUMBER OF APPROVED APPLICATIONS

TOTAL NUMBER OF TRAINEESHIPS

CERN



0*: Grants were approved, however traineeships started the subsequent year. The difference between approval and traineeships means: withdrawal by the organization or by the candidate.



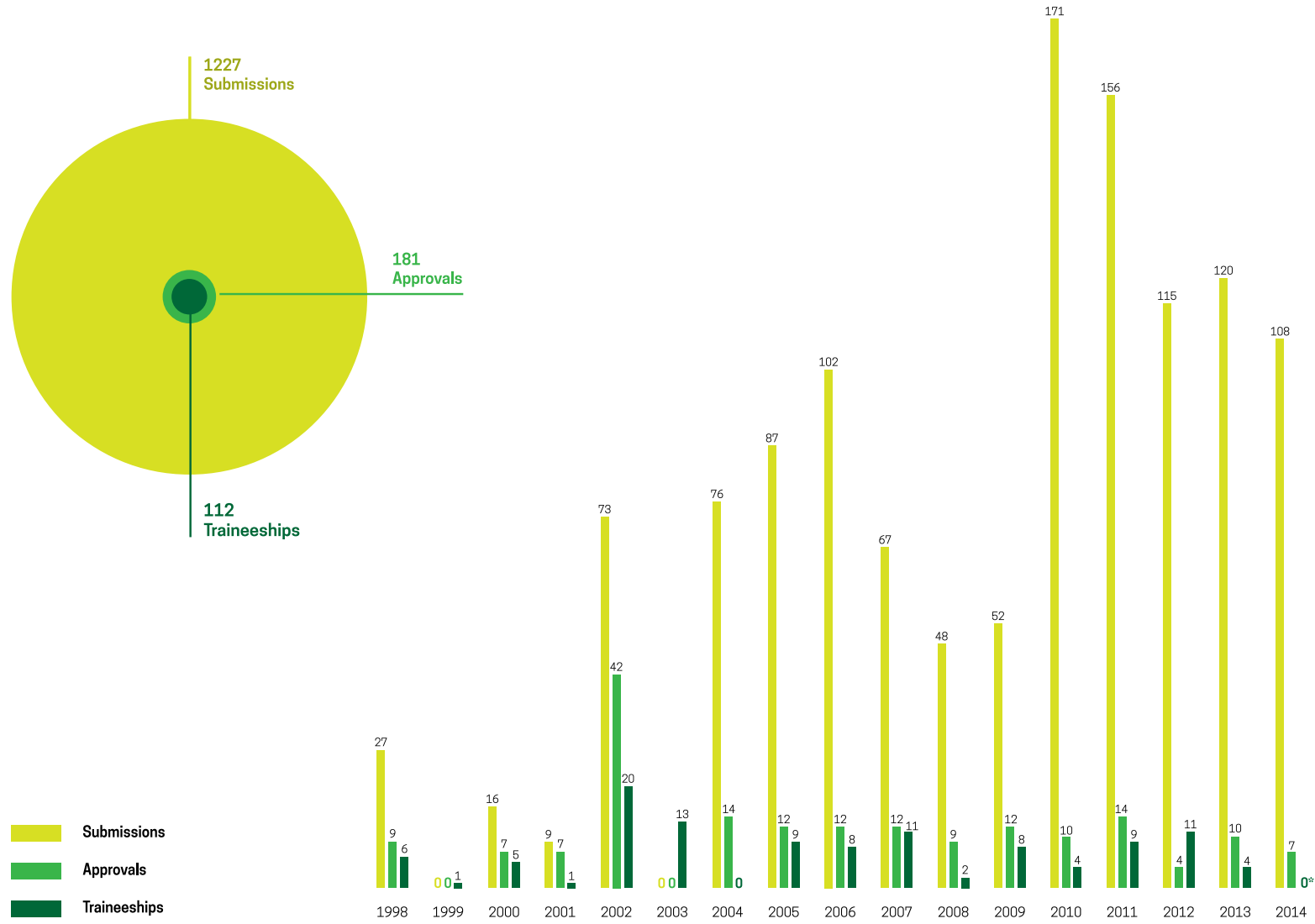
[The Portuguese Traineeship Programme] changed the course of my life by opening the doors to a fulfilling career in a unique scientific, multicultural and challenging environment.



BRUNO SOUSA

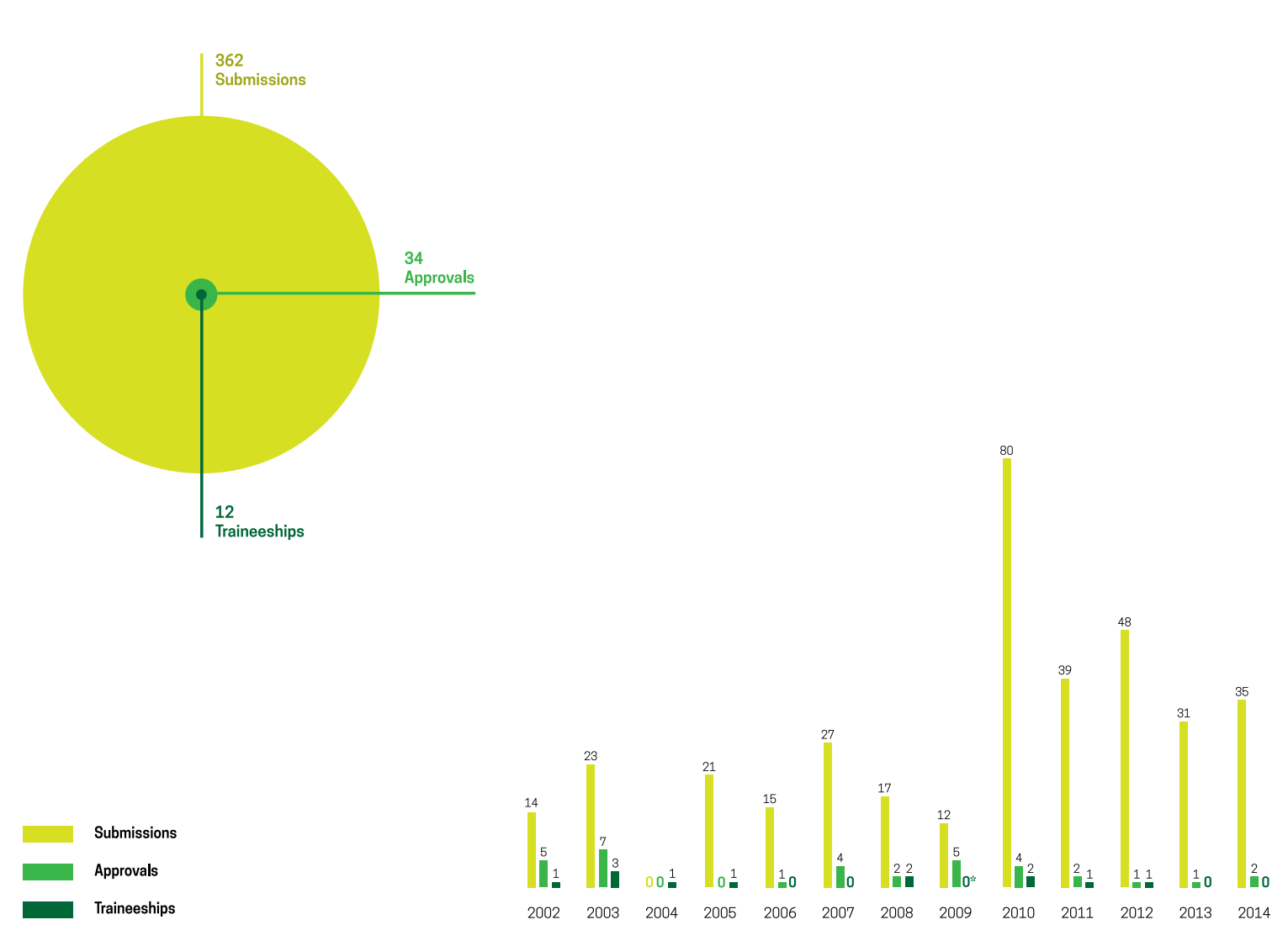
TRAINEE AT CERN 2008 - 2009

ESA



0*: Grants were approved, however traineeships started the subsequent year. The difference between approval and traineeships means: withdrawal by the organization or by the candidate.

ESO



0*: Grants were approved, however traineeships started the subsequent year. The difference between approval and traineeships means: withdrawal by the organization or by the candidate.

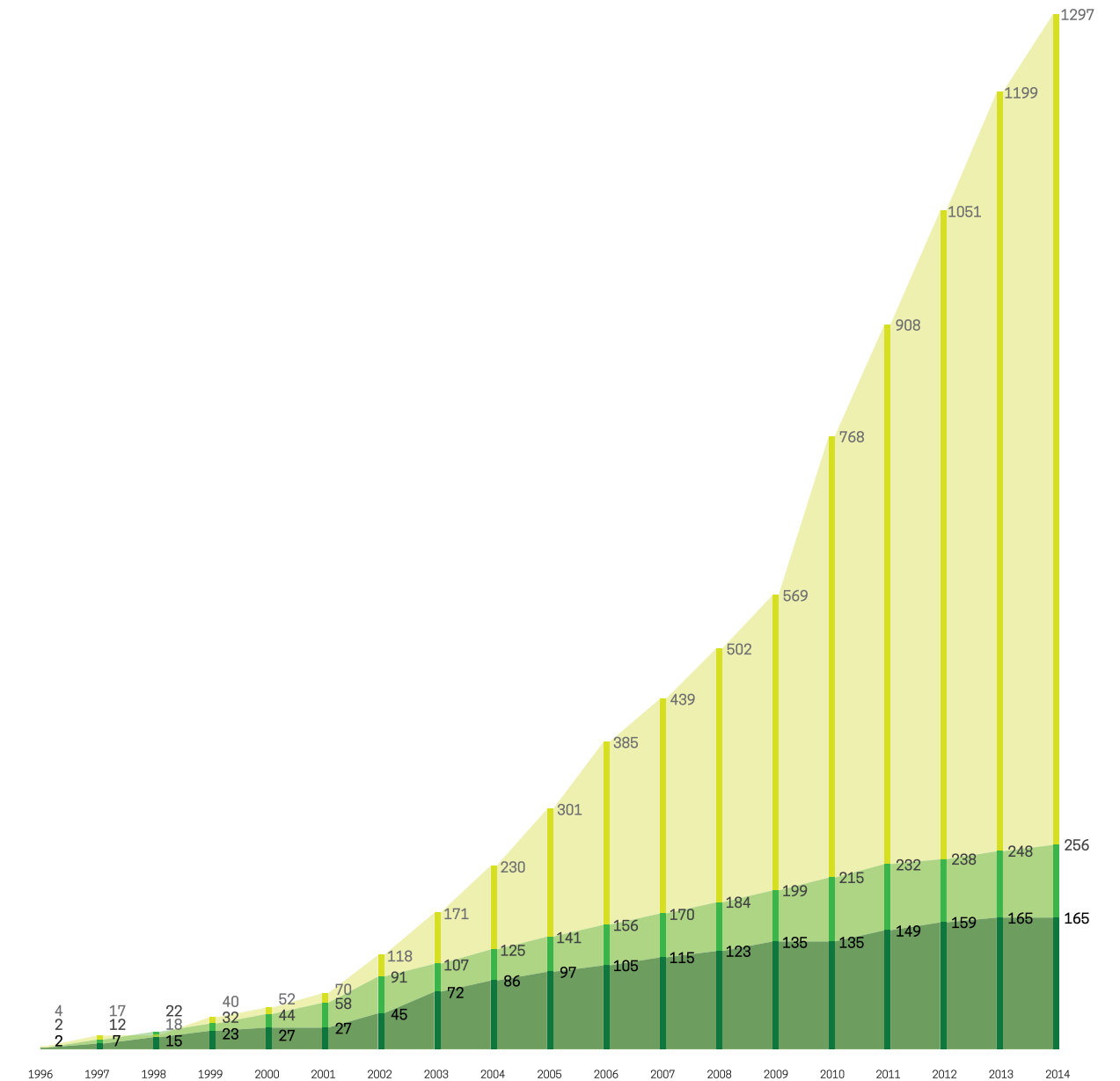
DISTRIBUTION OF APPLICATIONS - CUMULATIVE

TOTAL NUMBER OF SUBMISSIONS

TOTAL NUMBER OF APPROVED APPLICATIONS

TOTAL NUMBER OF TRAINEESHIPS

CERN



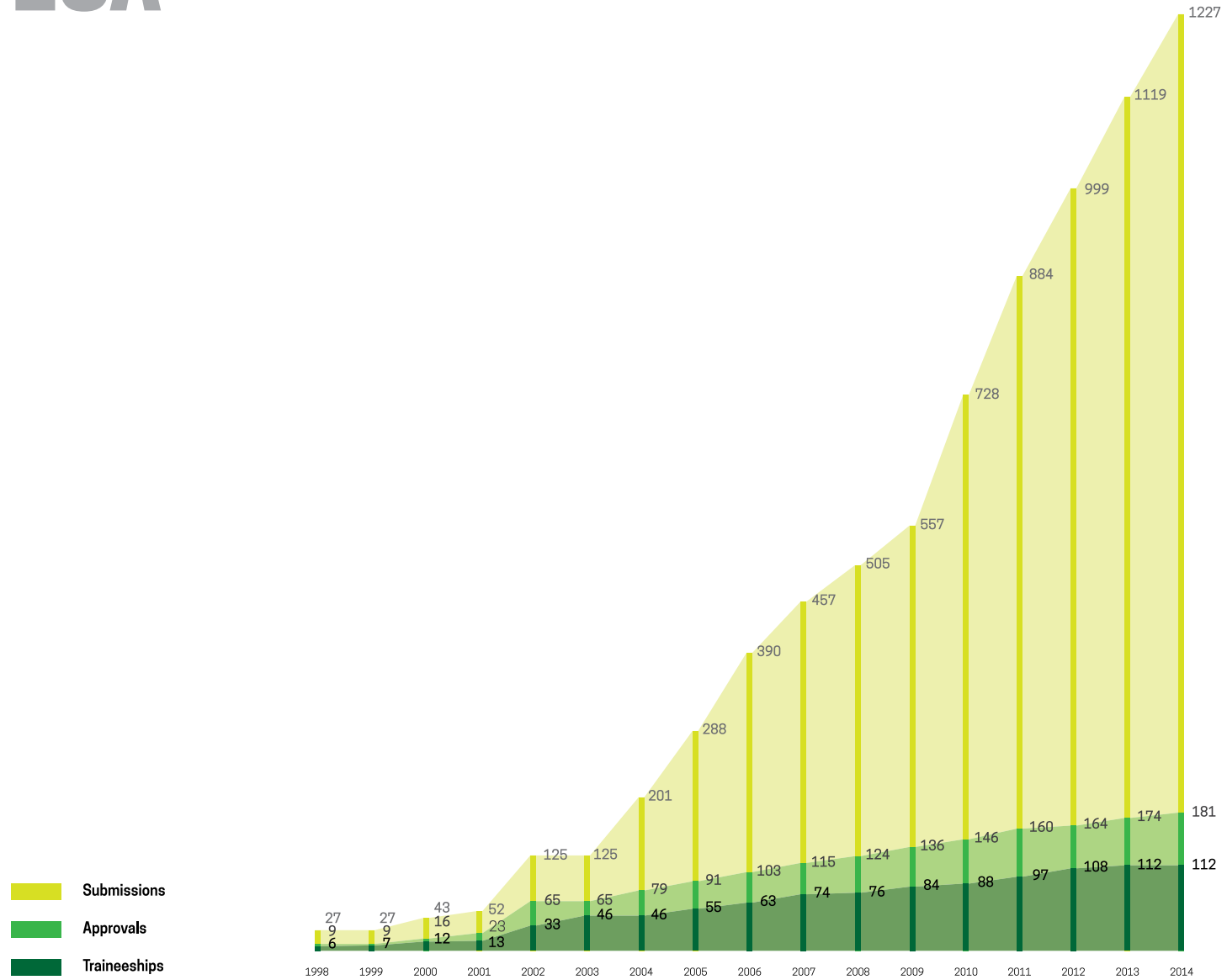
The FCT traineeship programme allowed me to get to know an intergovernmental organisation and to engage with the space sector, which brought the opportunity to take part in the Portuguese delegation to ESA.



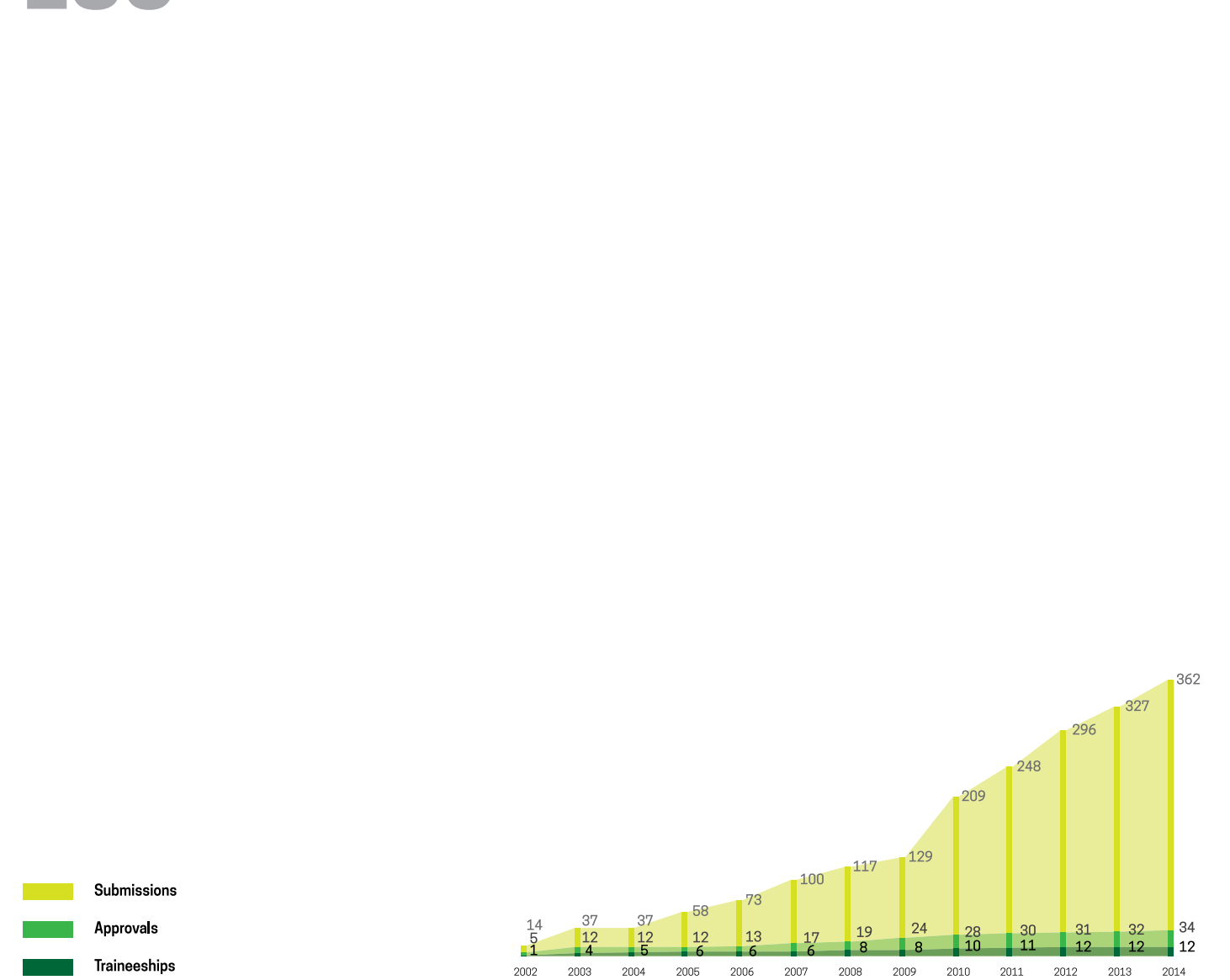
TERESA BRÁS

TRAINEE AT ESA 2009 - 2011

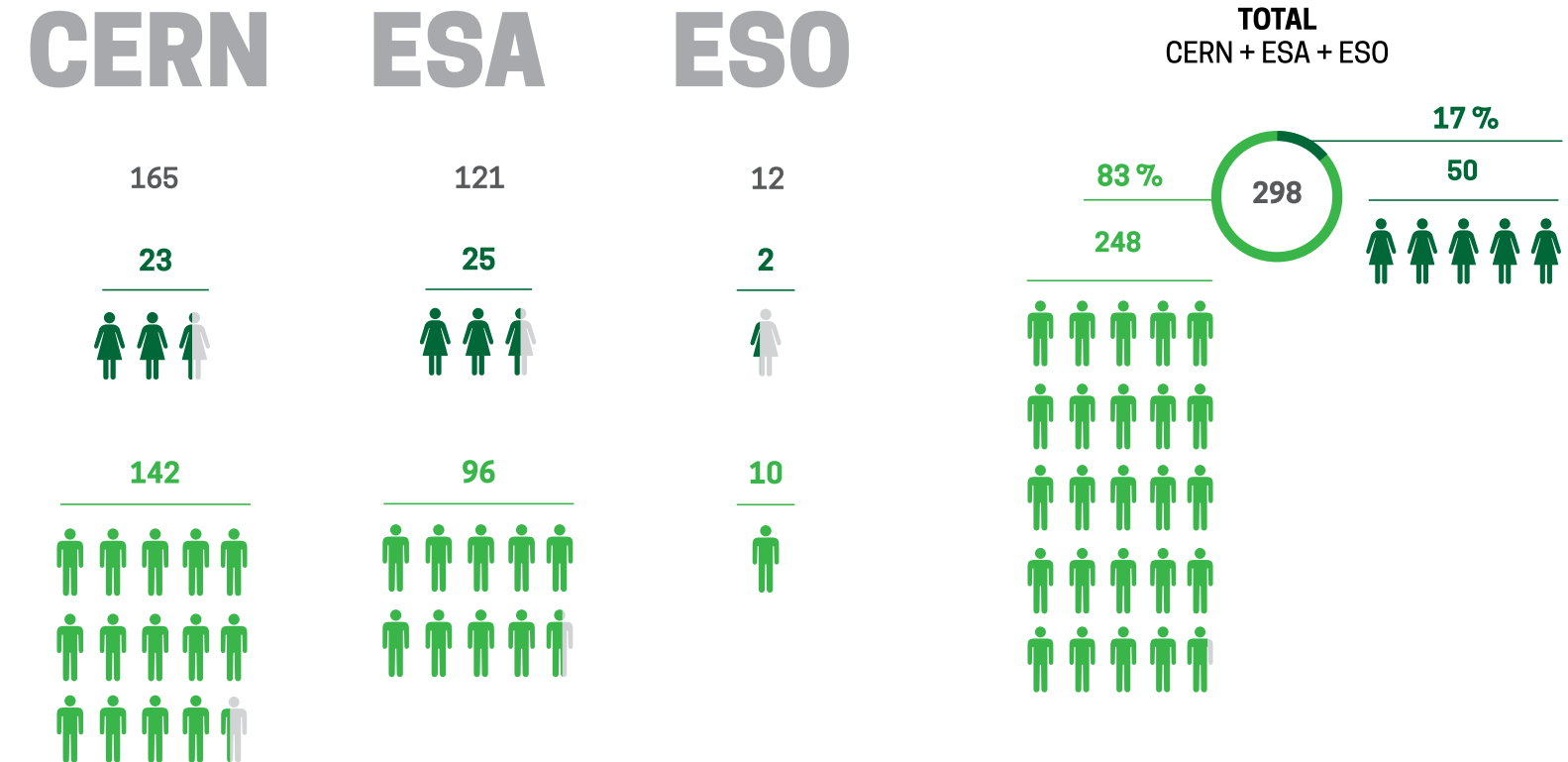
ESA



ESO



DISTRIBUTION OF TRAINEES BY GENDER



The Engineering Trainee Programme at the European Southern Observatory (ESO) in Garching, Munich is a prestigious programme that allowed me an unparalleled learning experience both at a personal level and to actively contribute to state-of-the-art projects. In particular, I was integrated in the Segmented Mirror Control System Group of the European - Extremely Large Telescope, an ambitious project at the forefront of engineering, and soon to be the largest telescope ever built.



JOSÉ DUARTE GONÇALVES
TRAINEE AT ESO 2010 - 2012

DISTRIBUTION BY HIGHER EDUCATION INSTITUTION

NUMBER OF TRAINEES PER INSTITUTION



My traineeship at ESA was key to being offered a position in the EMBL PhD programme in Cambridge, which allowed me to pursue my interest in computational biology.



ÂNGELA GONÇALVES

TRAINEE AT ESA 2007 - 2008

ESCE-IPS		1	ESCE-IPS - Escola Superior de Ciências Empresariais do Instituto Politécnico de Setúbal
FCTUC		7	FCTUC - Faculdade de Ciências e Tecnologia da Universidade de Coimbra
FCTUNL		16	FCTUNL - Faculdade de Ciências e Tecnologia da Universidade Nova de Lisboa
FCUL		18	FCUL - Faculdade de Ciências da Universidade de Lisboa
FCUP		4	FCUP - Faculdade de Ciências da Universidade do Porto
FEUP		51	FEUP - Faculdade de Engenharia da Universidade do Porto
IPLisboa		1	IPLisboa - Instituto Politécnico de Lisboa
IPLeiria		2	IPLeiria - Politécnico de Leiria
ISA		2	ISA - Instituto Superior de Agronomia
ISCTE-IUL		3	ISCTE-IUL - ISCTE - Instituto Universitário de Lisboa
NOVA IMS		1	NOVA IMS - NOVA Information Management School
ISEL		2	ISEL - Instituto Superior de Engenharia de Lisboa
ISEP		2	ISEP - Instituto Superior de Engenharia do Porto
U. Europeia		1	U. Europeia - Universidade Europeia
IST		104	IST - Instituto Superior Técnico
ISTP		1	ISTP - Instituto Superior de Transportes de Lisboa
U.Algarve		2	U.Algarve - Universidade do Algarve
U.Aveiro		20	U.Aveiro - Universidade de Aveiro
U.Birmingham		1	U.Birmingham - University of Birmingham
U.Coimbra		21	U.Coimbra - Universidade de Coimbra
U.Évora		2	U.Évora - Universidade de Évora
U.Lusíada		2	U.Lusíada - Universidade Lusíada de Lisboa
U.Minho		14	U.Minho - Universidade do Minho
U.Nova de Lisboa		15	U.Nova de Lisboa - Universidade Nova de Lisboa
U.Porto		1	U.Porto - Universidade do Porto
U.Wisconsin		1	U. Wisconsin - University of Wisconsin
UTAD		4	UTAD - Universidade de Trás-os-Montes e Alto Douro
U.Beira Interior		4	U.Beira Interior - Universidade da Beira Interior
U.Southampton		1	U.Southampton - University of Southampton

TECHNOLOGICAL DOMAINS OF THE TRAINEESHIPS



The ESA Portuguese Trainee programme was the perfect opening for my early career. During my stay at ESTEC I had the chance to learn invaluable skills, while concurrently applying them to space projects. This experience not only added to my engineering expertise, but also gave me the chance to become a successful project manager in the space industry.



JOÃO PEDRO NETO

TRAINEE AT ESA 2011 - 2012



DISTRIBUTION OF TRAINEES BY TYPE OF ACTIVITY (POST-TRAINEESHIP)

A QUESTIONNAIRE WAS SENT TO TRAINEES WHO TOOK PART IN THE PROGRAMME BETWEEN 2010-2014.

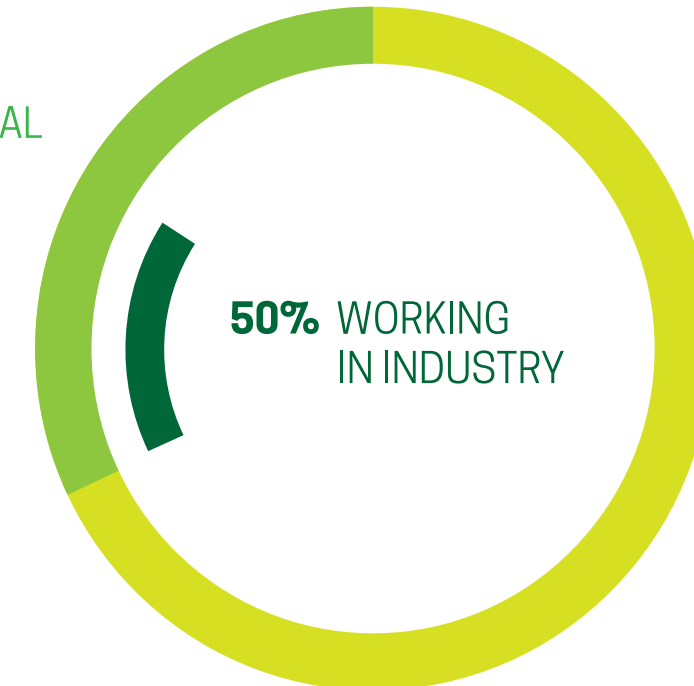
PERIOD 2010 - 2014

SAMPLE = 71

RESPONDENTS = 38

% OF RESPONDENTS = 54%

32% WORKING
IN PORTUGAL



68% WORKING
INTERNATIONALLY

“

My work at ESA-ESTEC as Portuguese Trainee obviously gave me an important improvement in my mechanical/aeronautics technical knowledge in real world working close to the industry, but the most important lessons I took from my work were the working methods and tasks organisation, in order to work better, safer and more efficiently.

”

JOÃO NOÉME

TRAINEE AT ESA 2002 - 2004

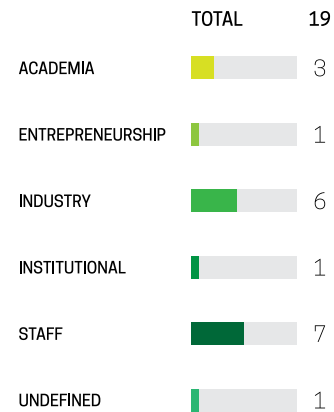
PERIOD 2010 - 2014

CERN

4 WORKING IN PORTUGAL



15 WORKING INTERNATIONALLY

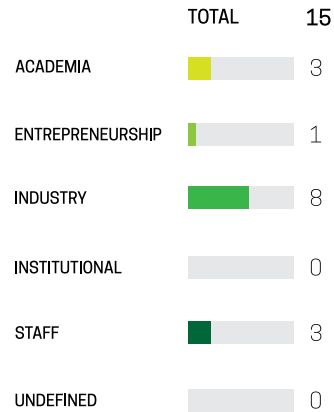


ESA

6 WORKING IN PORTUGAL



9 WORKING INTERNATIONALLY

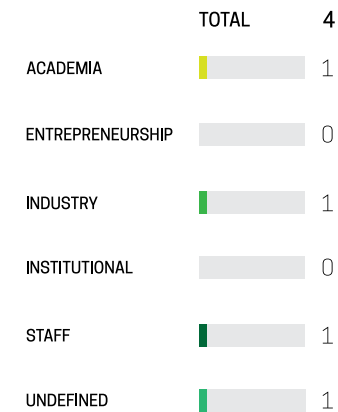


ESO

2 WORKING IN PORTUGAL



2 WORKING INTERNATIONALLY



“ Engineering training at CERN:
Beyond technical skills. ”

DENIS SANTOS
TRAINEE AT CERN 2007 - 2009

“ My internship at CERN represented my opportunity as a
young talent to “play in the Champions League”, and that’s
where I have been playing since then. ”

LUIS RAMOS
TRAINEE AT ESA 2005 - 2007

THIS BROCHURE IS ALSO AVAILABLE TO DOWNLOAD FROM THE
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