

# CERN Opportunities

## Industry, Knowledge Transfer, Advanced Training (introduction)

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(CERN Management Liaison for Portugal)

25 Nov 2019 , teatro THALIA, Lisboa



# CERN foi criado em 1954 por 12 Estados Europeus Portugal aderiu em 1986

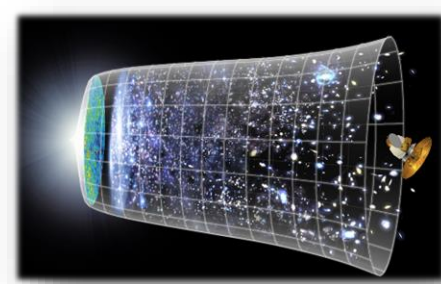
<http://home.web.cern.ch/about/member-states>



~ 2 600 funcionários  
~ 1 800 bolseiros, associados  
~ 13 600 utilizadores externos  
Budget (2019) ~1 200 MCHF

**Actualmente 23 Membros:** Austria, Belgium, Bulgaria, Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Israel, Italy, Netherlands, Norway, Poland, Portugal, Romania, Serbia, Slovak Republic, Spain, Sweden, Switzerland, United Kingdom

# a Missão do CERN



## 1. Avançar as fronteiras do conhecimento

os segredos do Big-Bang ...

como era a matéria durante os primeiros momentos de existência do Universo?

para onde foi a anti-matéria?

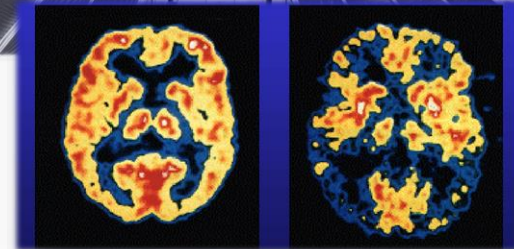
onde estão a matéria e energia escuras?

## 2. Desenvolver novas tecnologias para aceleradores e detectores spin-offs

Tecnologias de Informação – a Web e a GRID

Medicina – aceleradores e detectores para diagnóstico e terapia

Energia - Painéis solares com ultra-vácuo



## 3. Formar os cientistas e engenheiros do futuro

## 4. Promover Ciência para a paz

Unir pessoas, países e culturas



# as Ferramentas

## 1. Aceleradores:

partículas com energias elevadíssimas  
colidem a velocidades muito próximas da luz

mais rápido autódromo do planeta; mais frio que no espaço



## 2. Detectores:

Instrumentos gigantes

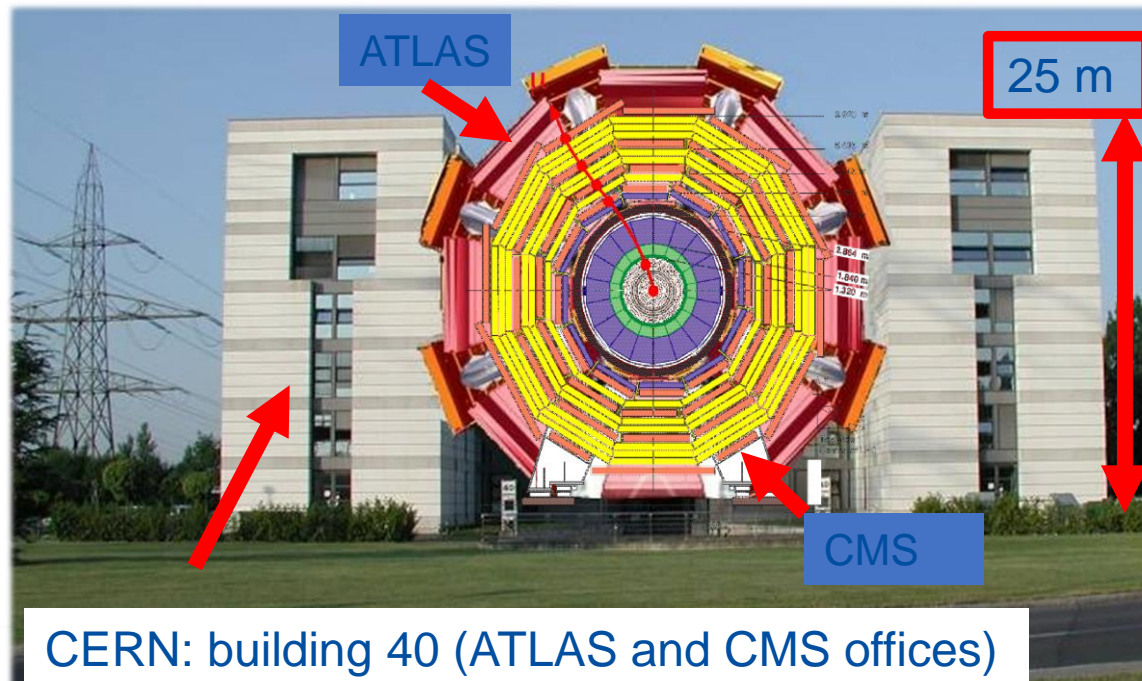
observam os resultados das colisões de partículas

altos como edifícios de 5 andares

## 3. Computadores:

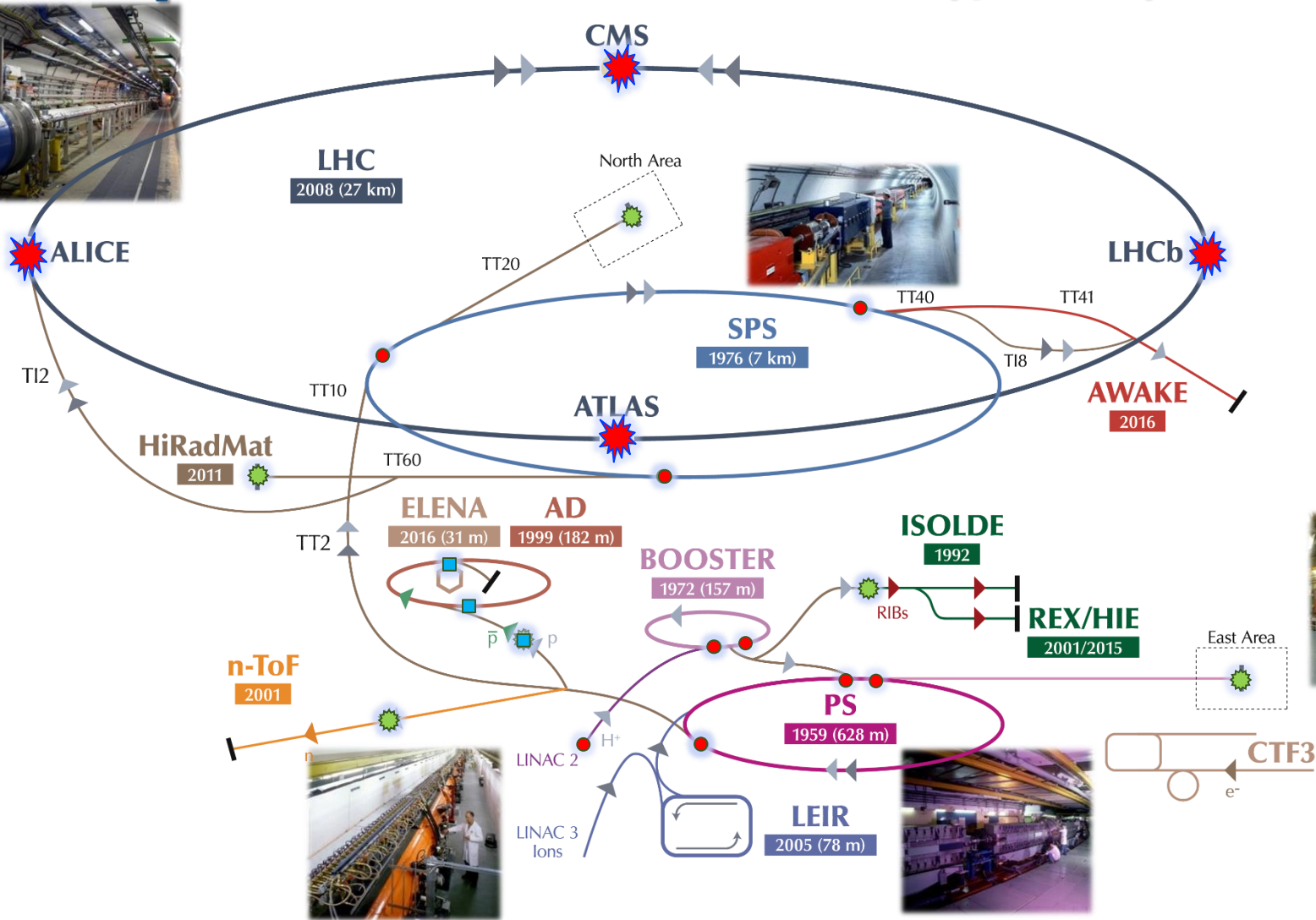
Armazenar, distribuir e analisar  
quantidades enormes de informação  
geradas pelos detectores

Onde nasceu o WWW



# o Complexo de Aceleradores (prótons)

Courtesy of Jose Ferreira Somoza (TE-VSC)



▶ p (protons)
▶ ions
▶ RIBs (Radioactive Ion Beams)
▶ n (neutrons)
▶  $\bar{p}$  (antiprotons)
▶  $e^-$  (electrons)
↔ proton/antiproton conversion
↔ proton/RIB conversion

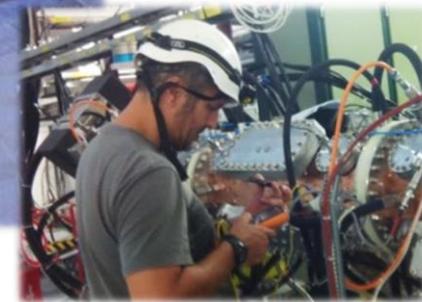
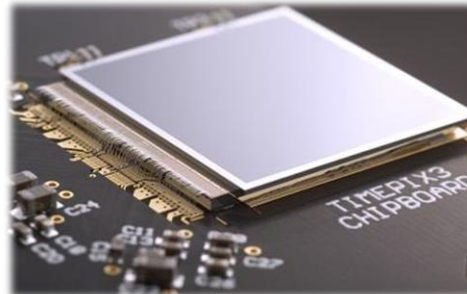
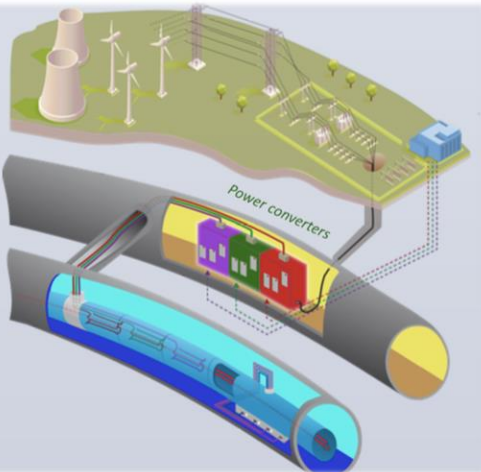
- LHC** Large Hadron Collider
- SPS** Super Proton Synchrotron
- PS** Proton Synchrotron
- AD** Antiproton Decelerator
- CTF3** Clic Test Facility
- AWAKE** Advanced WAKEfield Experiment
- ISOLDE** Isotope Separator OnLine
- REX/HIE** Radioactive EXperiment/High Intensity and Energy ISOLDE
- LEIR** Low Energy Ion Ring
- LINAC** LINear ACcelerator
- n-ToF** Neutrons Time Of Flight
- HiRadMat** High-Radiation to Materials

<http://home.web.cern.ch/about>



# tecnologias no CERN

- Electrónica
- Informática / ICT
- Criogenia & Vácuo
- Sistemas de Controlo
- Electricidade
- Electroímans
- Robótica
- Radiofrequência
- Mecânica
- Ciência Materiais



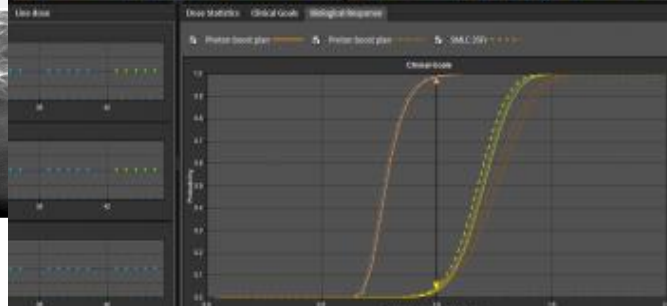
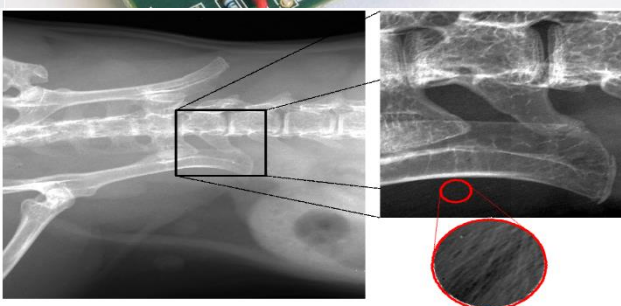
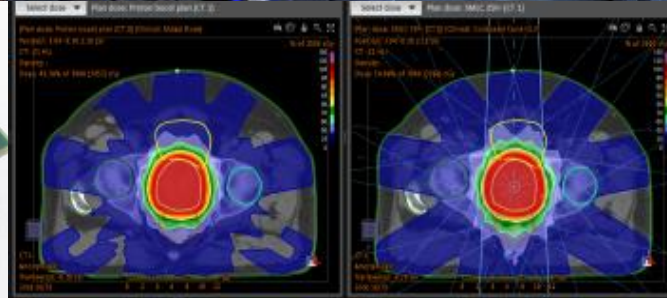
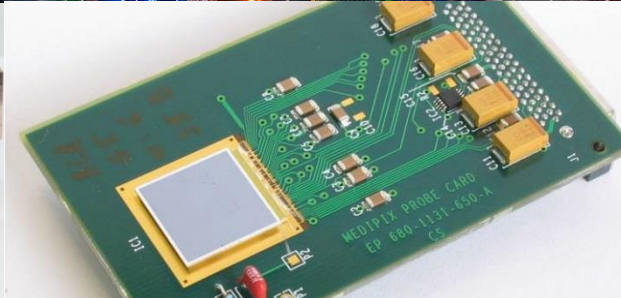
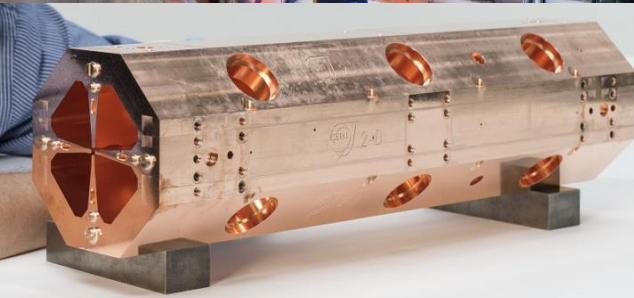
# Aceleradores



# Detectores



# Computadores



## Aplicações Médicas derivadas do CERN

<http://kt.cern/medtech>

Aceleradores para terapia com prótons

Detectores para imagem e diagnóstico

Computadores para simulação de terapia

# Indústria Portuguesa e o CERN

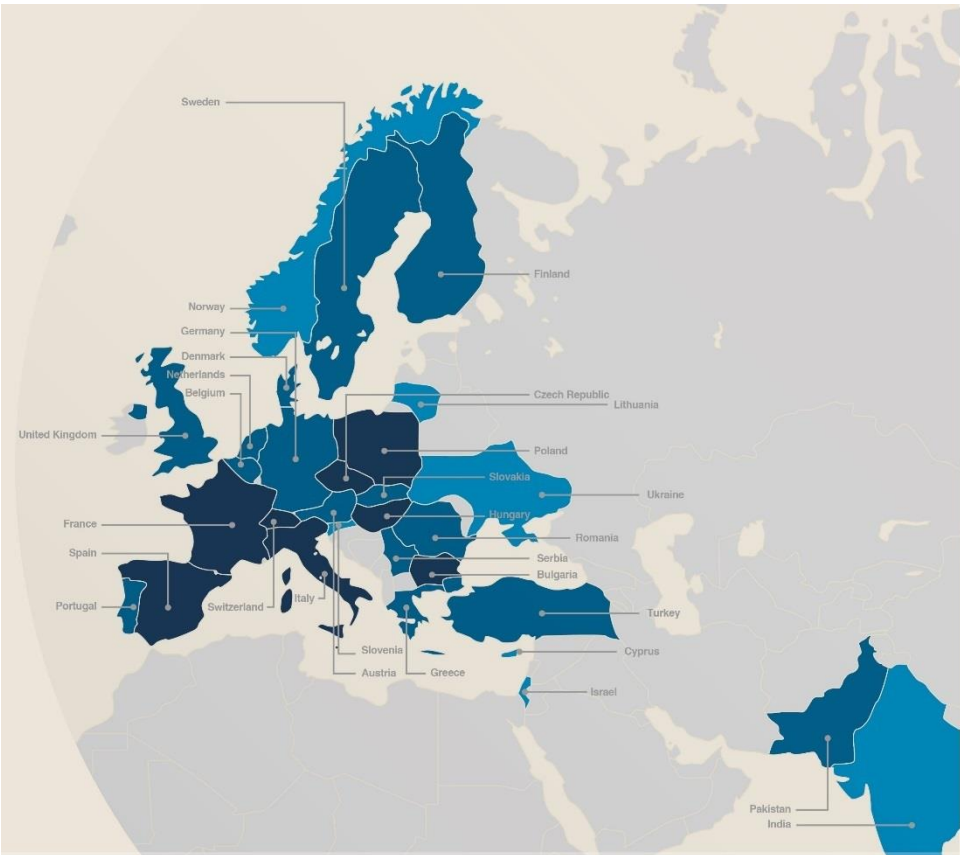




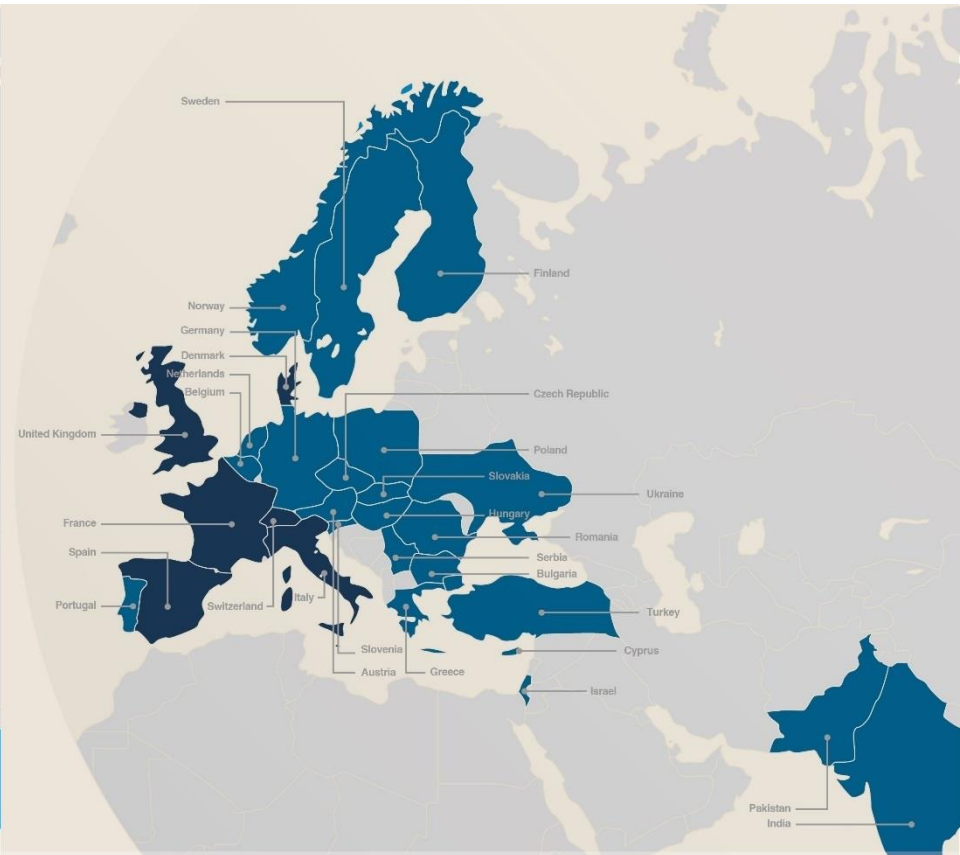
# Contribuições estados membros (2018)

| Country        | %           | In CHF, 2018 prices  |
|----------------|-------------|----------------------|
| Austria        | 2.14546     | 24 091 850           |
| Belgium        | 2.70652     | 30 392 150           |
| Bulgaria       | 0.29270     | 3 286 800            |
| Czech Republic | 0.93289     | 10 475 650           |
| Denmark        | 1.80239     | 20 239 450           |
| Finland        | 1.33102     | 14 946 350           |
| France         | 14.11914    | 158 547 200          |
| Germany        | 20.54959    | 230 756 250          |
| Greece         | 1.11916     | 12 567 300           |
| Hungary        | 0.61163     | 6 868 150            |
| Israel         | 1.61448     | 18 129 350           |
| Italy          | 10.42866    | 117 105 900          |
| Netherlands    | 4.60862     | 51 751 300           |
| Norway         | 2.71026     | 30 434 150           |
| Poland         | 2.81891     | 31 654 200           |
| Portugal       | 1.10135     | 12 367 300           |
| Romania        | 1.02257     | 11 482 650           |
| Slovakia       | 0.48819     | 5 482 000            |
| Spain          | 7.04175     | 79 073 450           |
| Sweden         | 2.68934     | 30 199 200           |
| Switzerland    | 4.02461     | 45 193 300           |
| United Kingdom | 15.84076    | 177 879 750          |
| <b>Total</b>   | <b>100%</b> | <b>1 122 923 700</b> |

# well / poorly balanced states (2018)



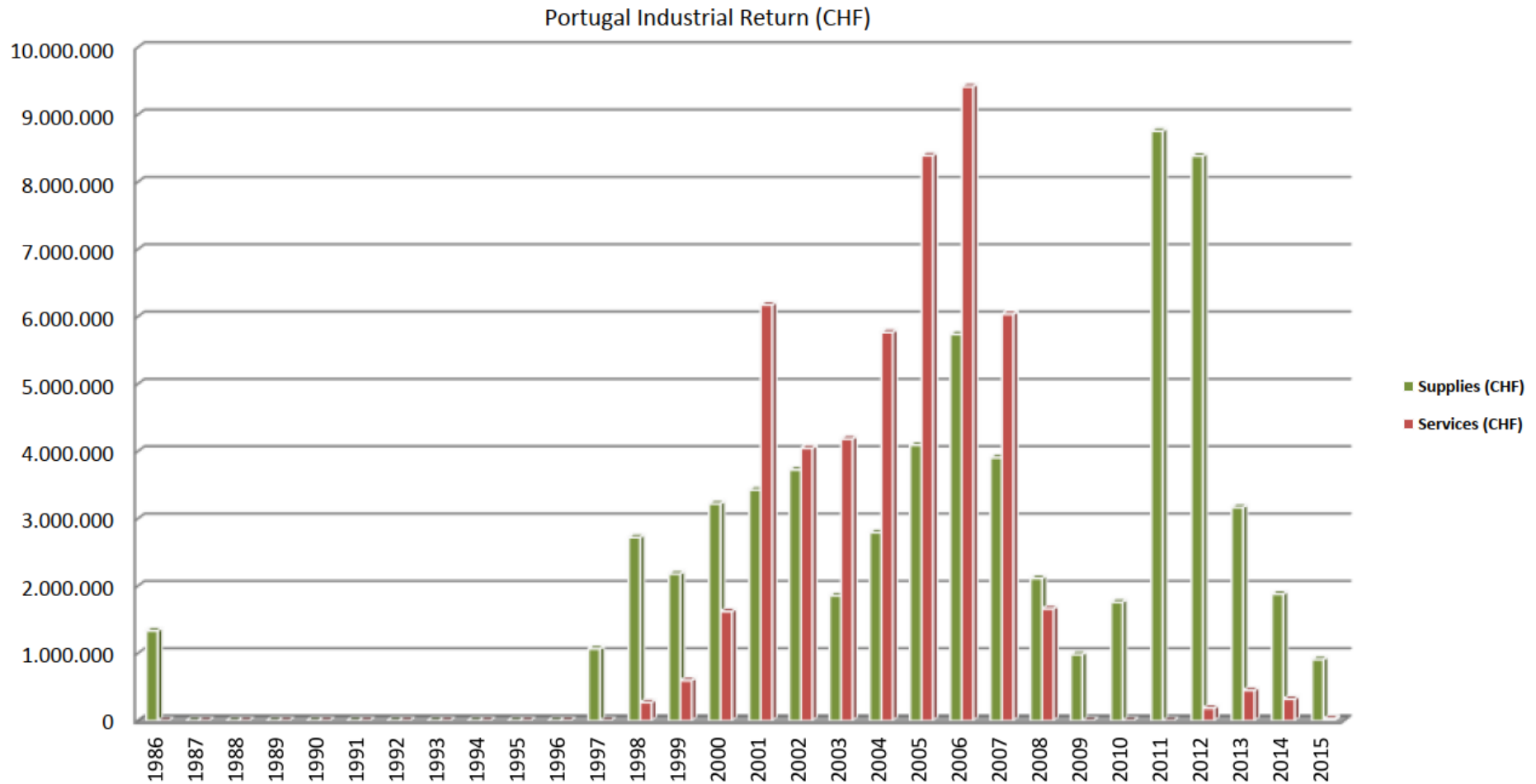
Supplies 2014-2017



Industrial Services 2014-2017



# PT – retorno industrial (2015)



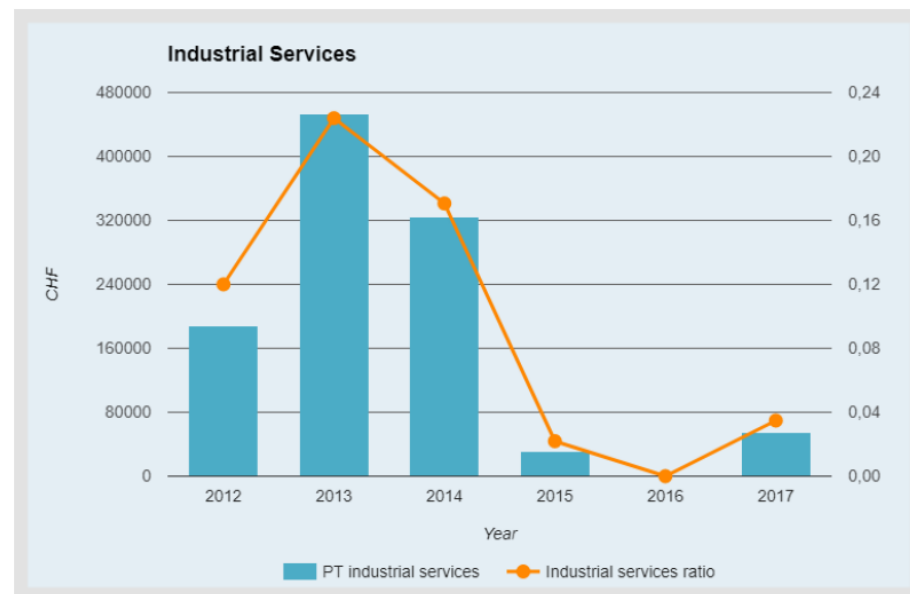
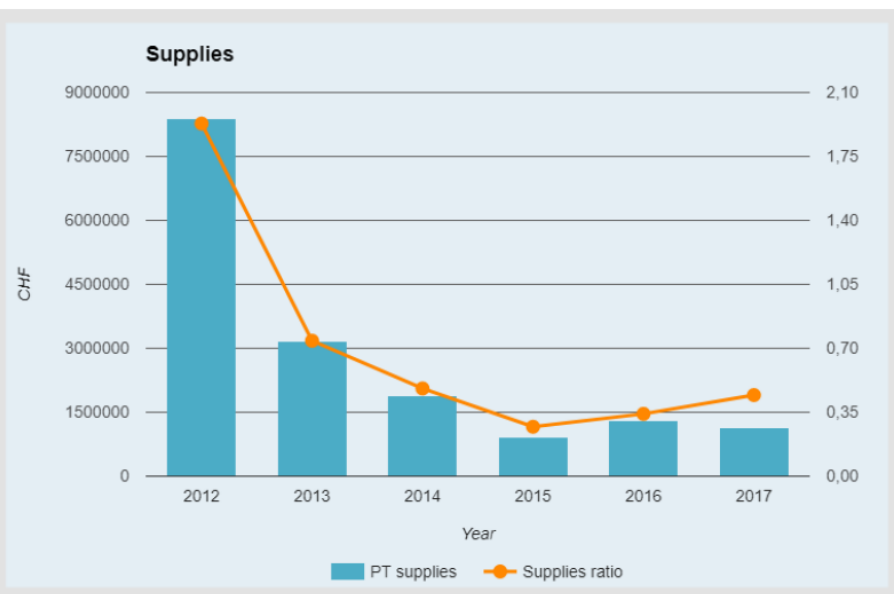
# PT – retorno industrial (2017)

|      | CERN Budget        |                 |            |
|------|--------------------|-----------------|------------|
|      | Total Contribution | Contribution PT |            |
|      | I                  | II              | III = II/I |
|      | CHF                | CHF             | %          |
| 2012 | 1,091,804,300      | 13,492,750      | 1.24%      |
| 2013 | 1,092,816,950      | 13,289,900      | 1.22%      |
| 2014 | 1,103,322,899      | 13,205,900      | 1.2%       |
| 2015 | 1,062,202,700      | 12,009,800      | 1.13%      |
| 2016 | 1,127,444,450      | 12,680,500      | 1.12%      |
| 2017 | 1,142,179,450      | 12,473,650      | 1.09%      |

| Expenditure for All Countries |                     |
|-------------------------------|---------------------|
| Supplies                      | Industrial Services |
| IV                            | V                   |
| CHF                           | CHF                 |
| 352,236,775                   | 130,558,377         |
| 351,567,741                   | 166,390,502         |
| 329,242,703                   | 159,408,925         |
| 297,504,934                   | 126,378,183         |
| 342,576,843                   | 146,917,979         |
| 232,086,828                   | 142,731,742         |

| Expenditure by Country of Origin PT |                     |
|-------------------------------------|---------------------|
| Supplies                            | Industrial Services |
| VI                                  | VII                 |
| CHF                                 | CHF                 |
| 8,388,473                           | 187,945             |
| 3,169,248                           | 453,185             |
| 1,881,795                           | 324,017             |
| 909,663                             | 31,243              |
| 1,312,735                           | –                   |
| 1,125,686                           | 54,200              |

| Industrial Return Ratios PT |                     |
|-----------------------------|---------------------|
| Supplies                    | Industrial Services |
| VIII = (VI/IV) / III        | IX = (VII/V) / III  |
| CHF                         | CHF                 |
| 1.93 (0.89)                 | .12 (0.4)           |
| .74 (0.91)                  | .22 (0.4)           |
| .48 (0.91)                  | .17 (0.4)           |
| .27 (0.9)                   | .02 (0.4)           |
| .34 (0.9)                   | 0 (0.4)             |
| .44 (1)                     | .03 (0.4)           |



# FCT – indústria Pt no CERN

## PORTUGAL IN LARGE-SCALE RESEARCH FACILITIES

CERN

ESO

ESRF

ITER

### ORGANIZATIONS SUPPLIED BY THE COMPANY

#### CERN

- ▼ A. Silva Matos
- ▼ Active Space
- ▼ Cudell
- ▼ Cunhol
- ▼ Efacec
- ▼ Glintt
- ▼ Incomef
- ▼ ISQ
- ▼ NCP Metal
- ▼ Siroco
- ▼ Solidal

#### ESO

- ▼ A Silva Matos
- ▼ Active Space
- ▼ Critical Software
- ▼ Exatronic
- ▼ ISQ
- ▼ Solidal

#### ESRF

- ▼ Efacec
- ▼ Glintt

#### ITER

- ▼ A Silva Matos
- ▼ Active Space
- ▼ Fiber Sensing
- ▼ ISQ

### TECHNOLOGY DOMAIN

#### SOFTWARE

- ▼ Critical Software
- ▼ Cudell
- ▼ Efacec
- ▼ Exatronic
- ▼ Fiber Sensing
- ▼ Glintt
- ▼ Incomef

#### HARDWARE

- ▼ A. Silva Matos
- ▼ Active Space
- ▼ Cudell
- ▼ Cunhol
- ▼ Efacec
- ▼ Exatronic
- ▼ Fiber Sensing
- ▼ Glintt
- ▼ Incomef
- ▼ ISQ
- ▼ NCP Metal
- ▼ Siroco
- ▼ Solidal

folheto FCT - catálogo tecnologia Pt (2014)

# To be a successful CERN supplier

Courtesy of [Emir Sirage](#)  
(former ILO-PT)

## 3 issues a company must truly consider :

Allocate the best qualified human resources to start discussions with CERN  
(with proven technical experience and qualifications)


Be ready to invest (time and money) before any commercial supply/service contract is won with CERN

Understand that CERN is not a typical market, but  
A reference that represents Uniqueness, Challenge and Elevated Quality


### Successful stories

#### Example 1 – Multinational

**ENERGY SECTOR**



**efacec**  
www.efacec.com



**Network Management**  
Network Optimization, Energy Management and Operations Management (Forecasting, Short circuit analysis)

**SCADA System Operation**  
Control and Supervision of Electrical Substation information; Alarms and alerts received in real-time for situational awareness and decision support; Historic Data archiving and Reporting support.

**Field Automation**  
Protocol translation to IEC60870-5-104 from different third party IEDs using multiple communication protocols, high reliability, local archiving and local human machine Interface, Clock Synchronization.


**Power Supplies**  
Auxiliary power supplies for the LHC (Large Hadron Collider) particle accelerator: PS booster multipole correction magnets, Unac 2/3 & PSB transfer lines.

**Converters for LHC**  
Four quadrant power converters, DC switch mode converter modules, Power converters modules (MaxiDiscap and MiniDiscap), AC/DC-DC converter modules, MAXIDISCAP power converter up to 1kV.


### Successful stories

#### Example 2 – SME

**PRECISION MECHANICS & ENGINEERING SECTOR**



**SIROCO, S.A.**  
SOCIEDADE INDUSTRIAL DE ROBOTICA E CONTROLO  
www.siroco.com.pt



**High precision copper machining**

**Machining of Precision**

- Prototype manufacturing
- Tools and accessories manufacturing
- Execution of small and medium series

**Industrial Equipments**

- Industrial automation solutions
- Assembly lines
- Robotized cells
- Automatic testing systems
- Others according customer request

### Successful stories

#### Example 3 – Start-up

**SOFTWARE ENGINEERING SECTOR**



**doDOC®**  
Streamlining Scientific Writing



*"doDOC helps researchers streamline scientific writing and collaboration, so they can focus on the science!"*



The consortium chose doDOC to:

- Collaborate in a single platform
- Automate project and document workflows
- Securely access granular information
- Have complete oversight of all documents

# Portugueses e o CERN



# A great place to work?

Courtesy of James PURVIS  
(CERN - HR DH)

## Google Reviews

glassdoor 4.4 ★★★★★ Rating Trends

90% Recommend to a friend

96% Approve of CEO



St  
Pi  
1,  
Hi  
Re  
20



## CERN Reviews

Updated 20 August 2017

glassdoor 4.4 ★★★★★ Rating Trends

94% Recommend to a friend

97% Approve of CEO



Fabiola Gianotti  
50 Ratings



## Apple Reviews

glassdoor 4.0 ★★★★★ Rating Trends

79% Recommend to a friend

93% Approve of CEO



Tin  
6,2k  
High  
Rab  
201



## LE TEMPS MÉDIA SUISSE DE RÉFÉRENCE

Les meilleurs employeurs se trouvent dans la recherche, l'horlogerie et la banque

| Rang Global | Employeur                                | Score |
|-------------|--|-------|
| 1           | Rolex                                    | 8,59  |
| 2           | La Mobilière                             | 8,44  |
| 3           | Chemins de fer rhétiques                 | 8,41  |
| 4           | CERN                                     | 8,41  |
| 5           | Chocolat Frey                            | 8,15  |
| 6           | Philips                                  | 8,07  |
| 7           | Ecole polytechnique fédérale de Lausanne | 7,99  |
| 8           | Banque nationale suisse                  | 7,82  |
| 9           | Banque cantonale des Grisons             | 7,77  |
| 10          | Cisco                                    | 7,72  |

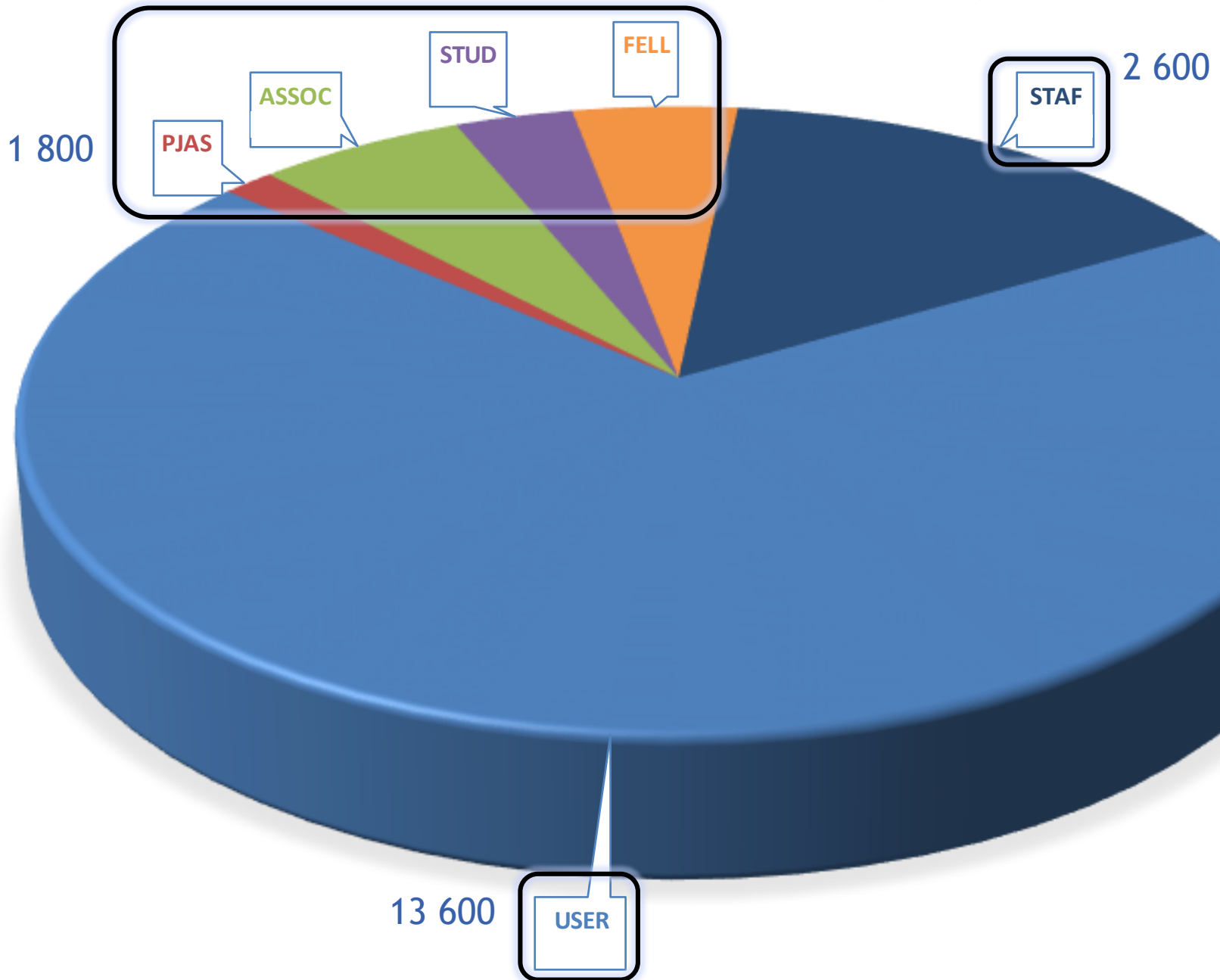
## UNIVERSUM

CERN is ranked as an Attractive Employer

| Switzerland          | 2016 | 2017 | 2018 |
|----------------------|------|------|------|
| <b>Students</b>      |      |      |      |
| Natural Sciences     | 4    | 3    | 4    |
| IT                   | 6    | 5    | 5    |
| Health/Medicine      | 21   | 40   | 26   |
| Engineering          | 3    | 3    | 4    |
| <b>Professionals</b> |      |      |      |
| Health/Medicine      | 22   | 29   | -    |
| Engineering          | 4    | 7    | 4    |
| IT                   | 6    | 7    | 8    |



# 18 000 CERNianos (2019)



# Pt – retorno pessoal (Ago 2019)



## Personnel return and contribution by primary nationality

01.08.2019

| Country      | Staff members |             | Fellows    |             | Doctoral students |             | Technical students |             | Admin. students |       | Normalized contribution |
|--------------|---------------|-------------|------------|-------------|-------------------|-------------|--------------------|-------------|-----------------|-------|-------------------------|
|              | hc            | %           | hc         | %           | hc                | %           | hc                 | %           | hc              | %     |                         |
| AT           | 54            | 2.04        | 11         | 1.39        | 22                | 9.95        | 5                  | 3.09        |                 |       | 2.11                    |
| BE           | 104           | 3.92        | 7          | 0.88        |                   |             |                    |             | 2               | 4.55  | 2.62                    |
| BG           | 15            | 0.57        | 6          | 0.76        |                   |             | 4                  | 2.47        |                 |       | 0.29                    |
| CH           | 220           | 8.30        | 27         | 3.41        | 6                 | 2.71        | 1                  | 0.62        | 4               | 9.09  | 4.02                    |
| CY           | 2             | 0.08        | 3          | 0.38        | 1                 | 0.45        |                    |             |                 |       | 0.09                    |
| CZ           | 6             | 0.23        | 8          | 1.01        | 1                 | 0.45        | 4                  | 2.47        |                 |       | 0.93                    |
| DE           | 174           | 6.56        | 54         | 6.83        | 52                | 23.53       | 16                 | 9.88        | 1               | 2.27  | 20.15                   |
| DK           | 18            | 0.68        | 2          | 0.25        |                   |             | 4                  | 2.47        |                 |       | 1.75                    |
| ES           | 164           | 6.18        | 79         | 9.99        | 14                | 6.33        | 12                 | 7.41        | 3               | 6.82  | 6.89                    |
| FI           | 29            | 1.09        | 9          | 1.14        |                   |             | 1                  | 0.62        |                 |       | 1.29                    |
| FR           | 979           | 36.92       | 103        | 13.02       | 16                | 7.24        | 7                  | 4.32        | 3               | 6.82  | 13.69                   |
| GB           | 221           | 8.33        | 58         | 7.33        | 9                 | 4.07        | 7                  | 4.32        |                 |       | 15.71                   |
| GR           | 48            | 1.81        | 54         | 6.83        | 12                | 5.43        | 19                 | 11.73       | 12              | 27.27 | 1.06                    |
| HU           | 16            | 0.60        | 7          | 0.88        | 3                 | 1.36        | 3                  | 1.85        | 1               | 2.27  | 0.59                    |
| IL           | 3             | 0.11        |            |             |                   |             |                    |             |                 |       | 1.69                    |
| IN           | 3             | 0.11        | 13         | 1.64        | 1                 | 0.45        | 6                  | 3.70        | 2               | 4.55  | 1.18                    |
| IT           | 310           | 11.69       | 140        | 17.70       | 41                | 18.55       | 23                 | 14.20       | 3               | 6.82  | 10.11                   |
| LT           | 2             | 0.08        | 1          | 0.13        |                   |             |                    |             |                 |       | 0.09                    |
| NL           | 67            | 2.53        | 12         | 1.52        | 3                 | 1.36        | 3                  | 1.85        |                 |       | 4.43                    |
| NO           | 17            | 0.64        | 21         | 2.65        | 2                 | 0.90        | 7                  | 4.32        | 3               | 6.82  | 2.42                    |
| PK           | 1             | 0.04        | 3          | 0.38        | 3                 | 1.36        | 3                  | 1.85        | 2               | 4.55  | 0.14                    |
| PL           | 75            | 2.83        | 64         | 8.09        | 15                | 6.79        | 18                 | 11.11       | 2               | 4.55  | 2.72                    |
| <b>PT</b>    | <b>57</b>     | <b>2.15</b> | <b>22</b>  | <b>2.78</b> | <b>4</b>          | <b>1.81</b> | <b>1</b>           | <b>0.62</b> |                 |       | <b>1.07</b>             |
| RO           | 16            | 0.60        | 11         | 1.39        |                   |             | 6                  | 3.70        | 1               | 2.27  | 1.02                    |
| RS           | 5             | 0.19        | 4          | 0.51        |                   |             | 3                  | 1.85        | 3               | 6.82  | 0.22                    |
| SE           | 23            | 0.87        | 7          | 0.88        | 4                 | 1.81        | 3                  | 1.85        |                 |       | 2.60                    |
| SI           |               |             |            |             | 1                 | 0.45        |                    |             |                 |       | 0.09                    |
| SK           | 11            | 0.41        | 7          | 0.88        | 1                 | 0.45        | 1                  | 0.62        |                 |       | 0.48                    |
| TR           | 1             | 0.04        | 3          | 0.38        | 3                 | 1.36        | 3                  | 1.85        | 1               | 2.27  | 0.49                    |
| UA           | 1             | 0.04        | 4          | 0.51        | 2                 | 0.90        | 2                  | 1.23        | 1               | 2.27  | 0.09                    |
| NMS          | 10            | 0.38        | 51         | 6.45        | 5                 | 2.26        |                    |             |                 |       |                         |
| <b>Total</b> | <b>2,652</b>  |             | <b>791</b> |             | <b>221</b>        |             | <b>162</b>         |             | <b>44</b>       |       |                         |

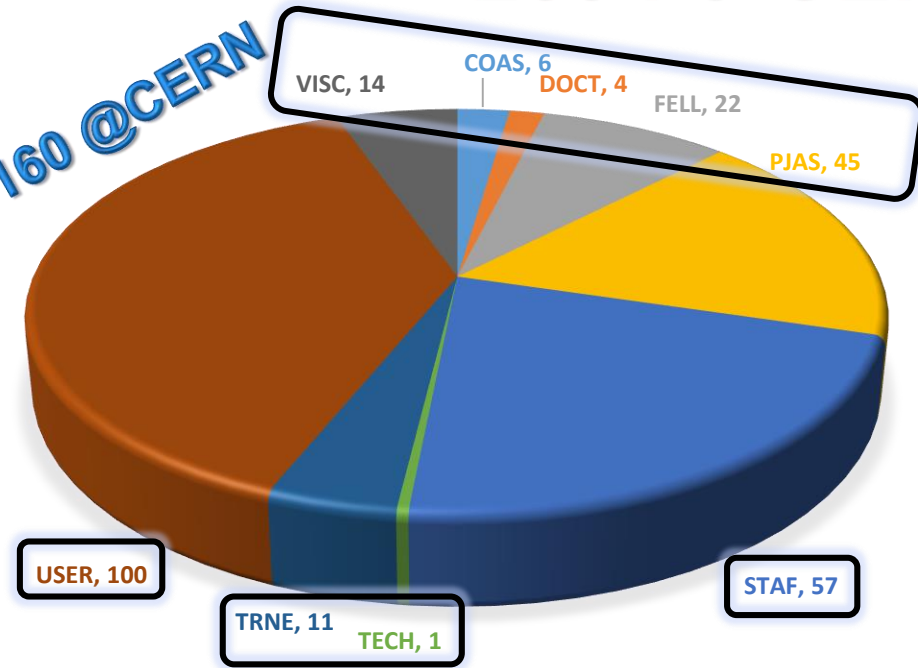
57 Staff  
 22 Fellows  
 4 Doctoral students  
 1 Technical student  
 11 Trainees FCT  
 (65 Associados)

Excelente retorno > 1.07%

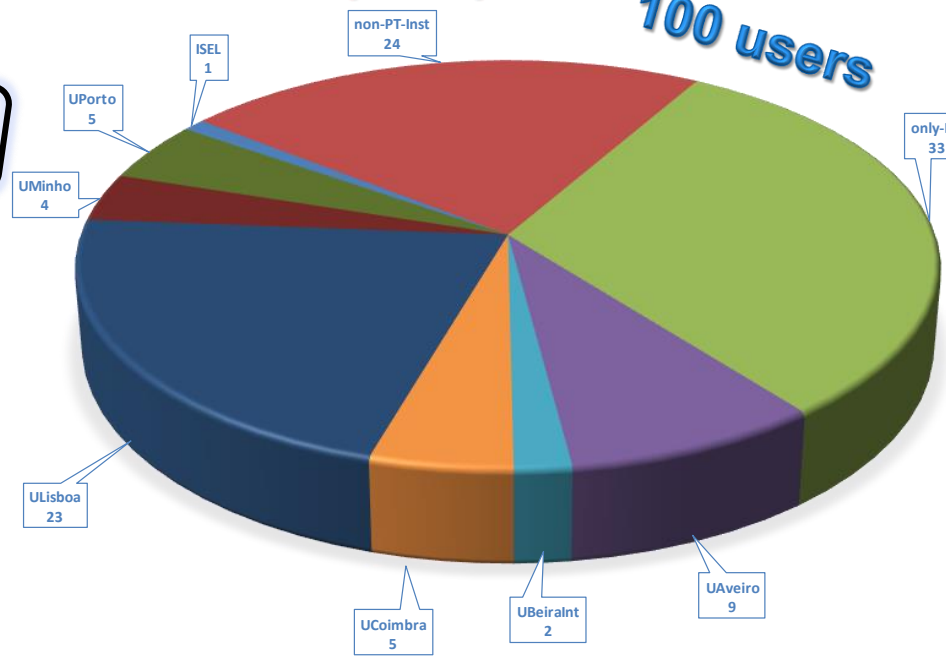
Personnel Return : ■ above 150% ■ between 81% and 150% ■ between 51% and 80% ■ below or equal to 50%

# 260 Pt CERNianos (2019)

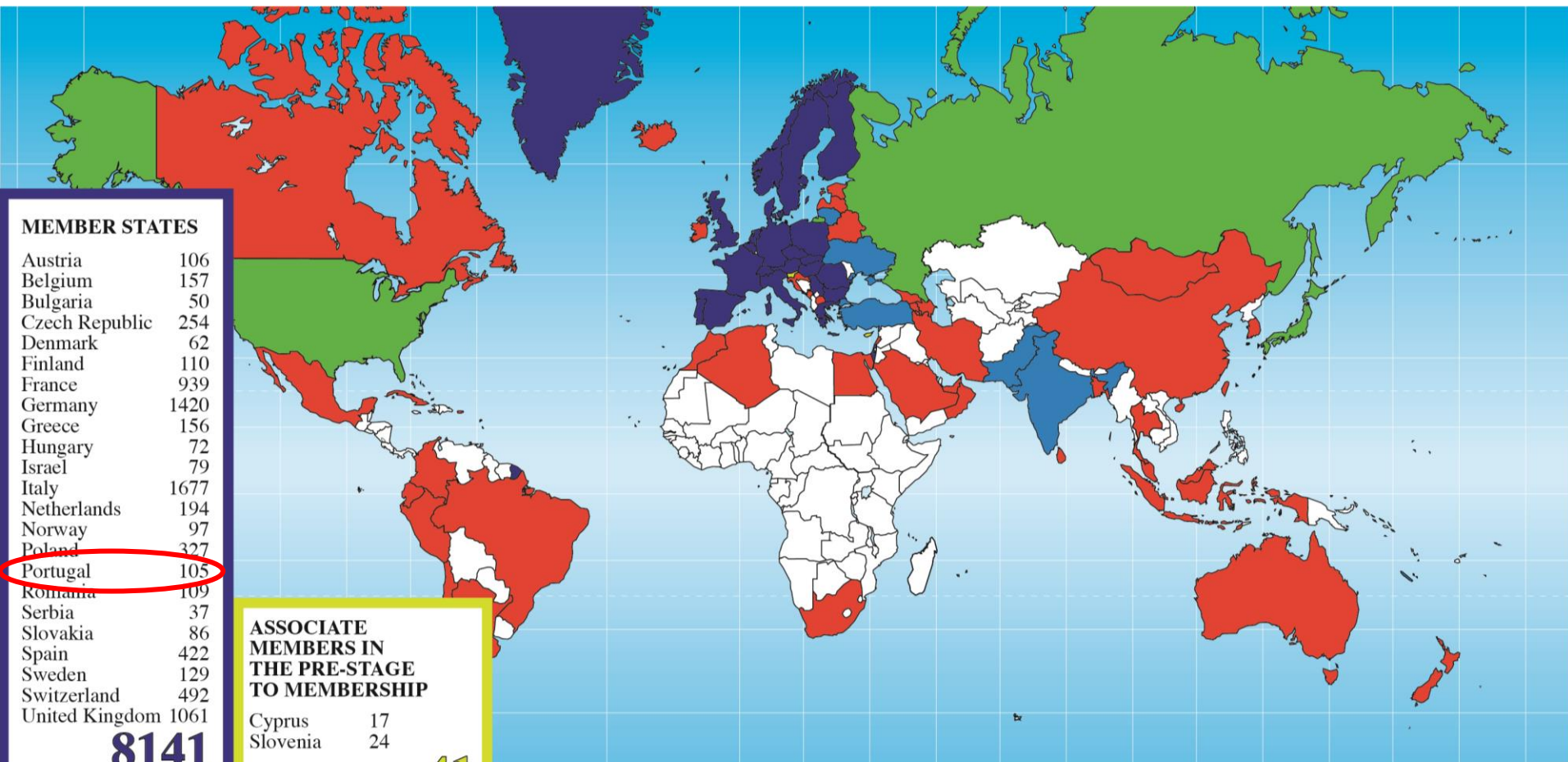
160 @CERN



100 users



# 13 600 Utilizadores CERN (Abr 2019)



## MEMBER STATES

|                |      |
|----------------|------|
| Austria        | 106  |
| Belgium        | 157  |
| Bulgaria       | 50   |
| Czech Republic | 254  |
| Denmark        | 62   |
| Finland        | 110  |
| France         | 939  |
| Germany        | 1420 |
| Greece         | 156  |
| Hungary        | 72   |
| Israel         | 79   |
| Italy          | 1677 |
| Netherlands    | 194  |
| Norway         | 97   |
| Poland         | 327  |
| Portugal       | 105  |
| Romania        | 109  |
| Serbia         | 37   |
| Slovakia       | 86   |
| Spain          | 422  |
| Sweden         | 129  |
| Switzerland    | 492  |
| United Kingdom | 1061 |

**8141**

## ASSOCIATE MEMBERS IN THE PRE-STAGE TO MEMBERSHIP

|          |    |
|----------|----|
| Cyprus   | 17 |
| Slovenia | 24 |

**41**

## ASSOCIATE MEMBERS 440

|           |     |
|-----------|-----|
| India     | 212 |
| Lithuania | 25  |
| Pakistan  | 43  |
| Turkey    | 126 |
| Ukraine   | 34  |

## OBSERVERS

|        |      |
|--------|------|
| Japan  | 277  |
| Russia | 1125 |
| USA    | 2073 |

**3475**

## OTHERS

|            |     |          |     |           |     |                 |    |              |    |
|------------|-----|----------|-----|-----------|-----|-----------------|----|--------------|----|
| Algeria    | 3   | Canada   | 213 | Hong Kong | 20  | Mexico          | 59 | Singapore    | 5  |
| Argentina  | 19  | Chile    | 19  | Iceland   | 3   | Mongolia        | 2  | South Africa | 84 |
| Armenia    | 16  | China    | 341 | Indonesia | 6   | Montenegro      | 7  | Sri Lanka    | 8  |
| Australia  | 30  | Colombia | 27  | Iran      | 21  | Morocco         | 15 | Taiwan       | 62 |
| Azerbaijan | 5   | Croatia  | 39  | Ireland   | 11  | New Zealand     | 8  | Thailand     | 19 |
| Bahrain    | 1   | Cuba     | 4   | Korea     | 170 | North Macedonia | 1  | U.A.E.       | 2  |
| Bangladesh | 2   | Ecuador  | 4   | Latvia    | 2   | Oman            | 4  |              |    |
| Belarus    | 21  | Egypt    | 17  | Lebanon   | 17  | Peru            | 3  |              |    |
| Brazil     | 122 | Estonia  | 18  | Malaysia  | 13  | Puerto Rico     | 1  |              |    |
|            |     | Georgia  | 33  | Malta     | 8   | Saudi Arabia    | 1  |              |    |

**1486**

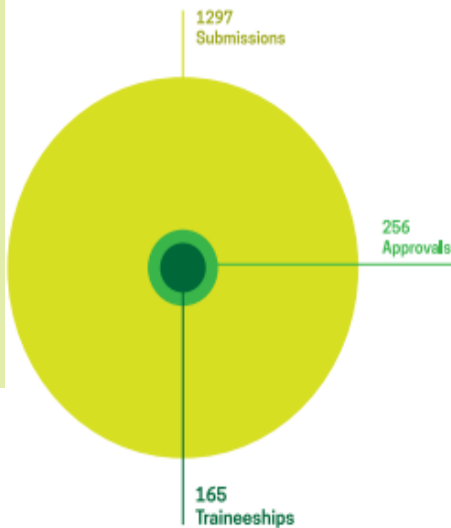
# FCT bolsas

<https://www.fct.pt/apoios/cooptrans/traineeships/CERN/2018/index.phtml.pt>  
[estagiostecnologicos@fct.pt](mailto:estagiostecnologicos@fct.pt)

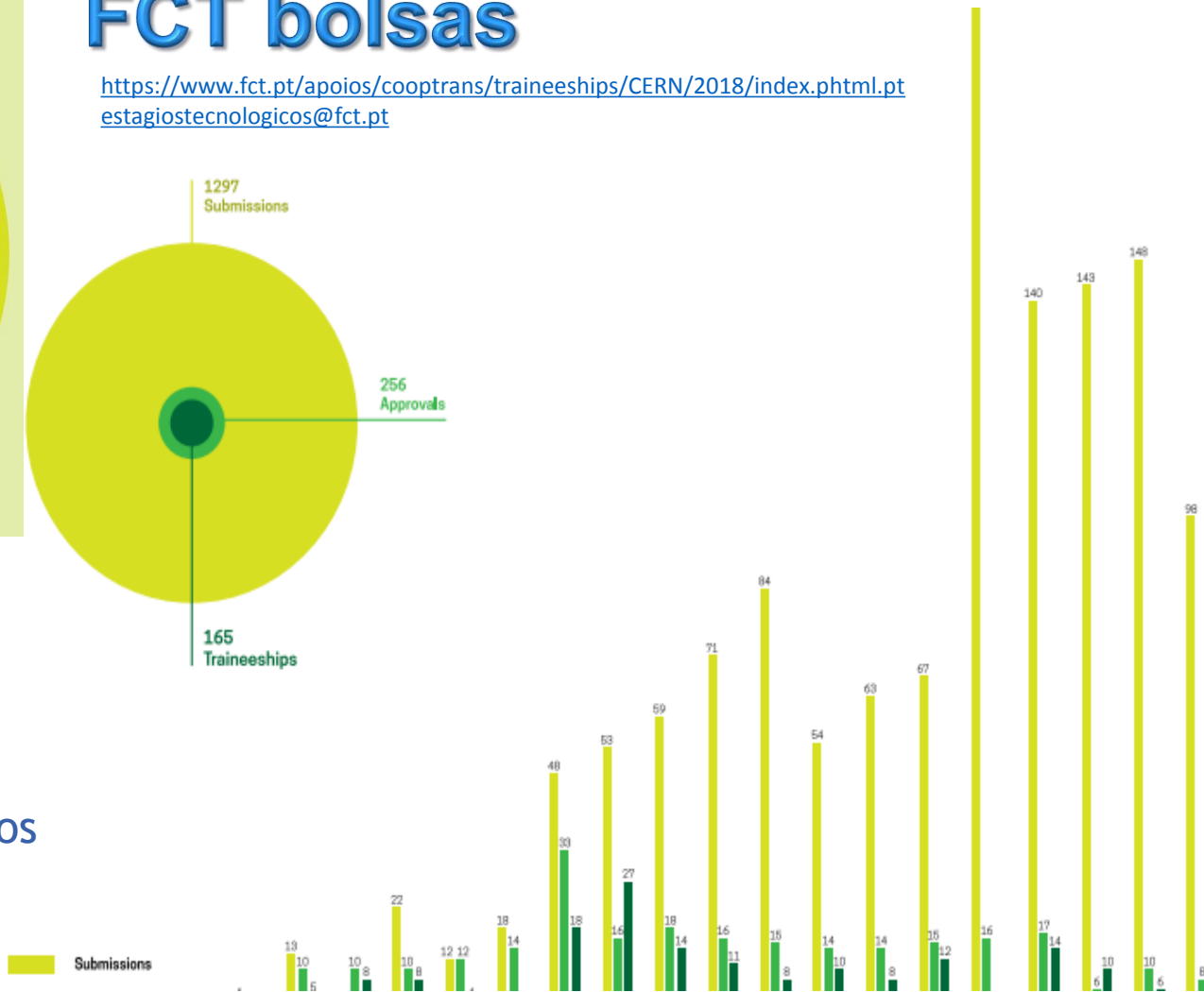


**FCT**  
 Fundação para a Ciência e a Tecnologia  
Associação de Instituições de Ensino Superior

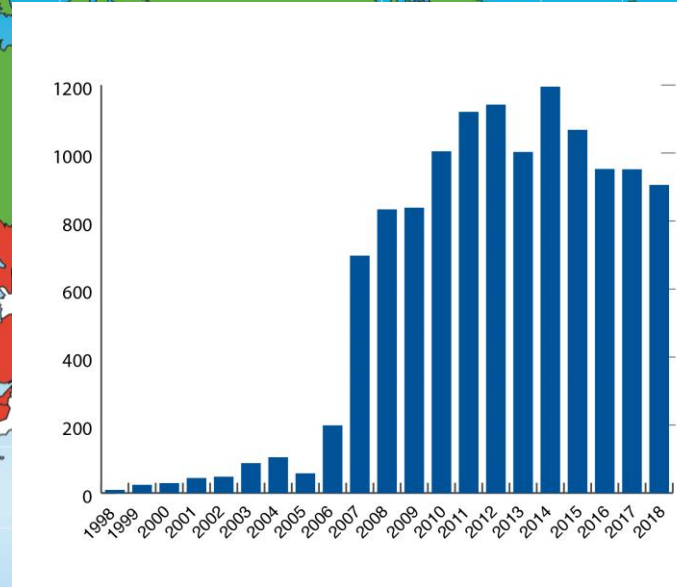
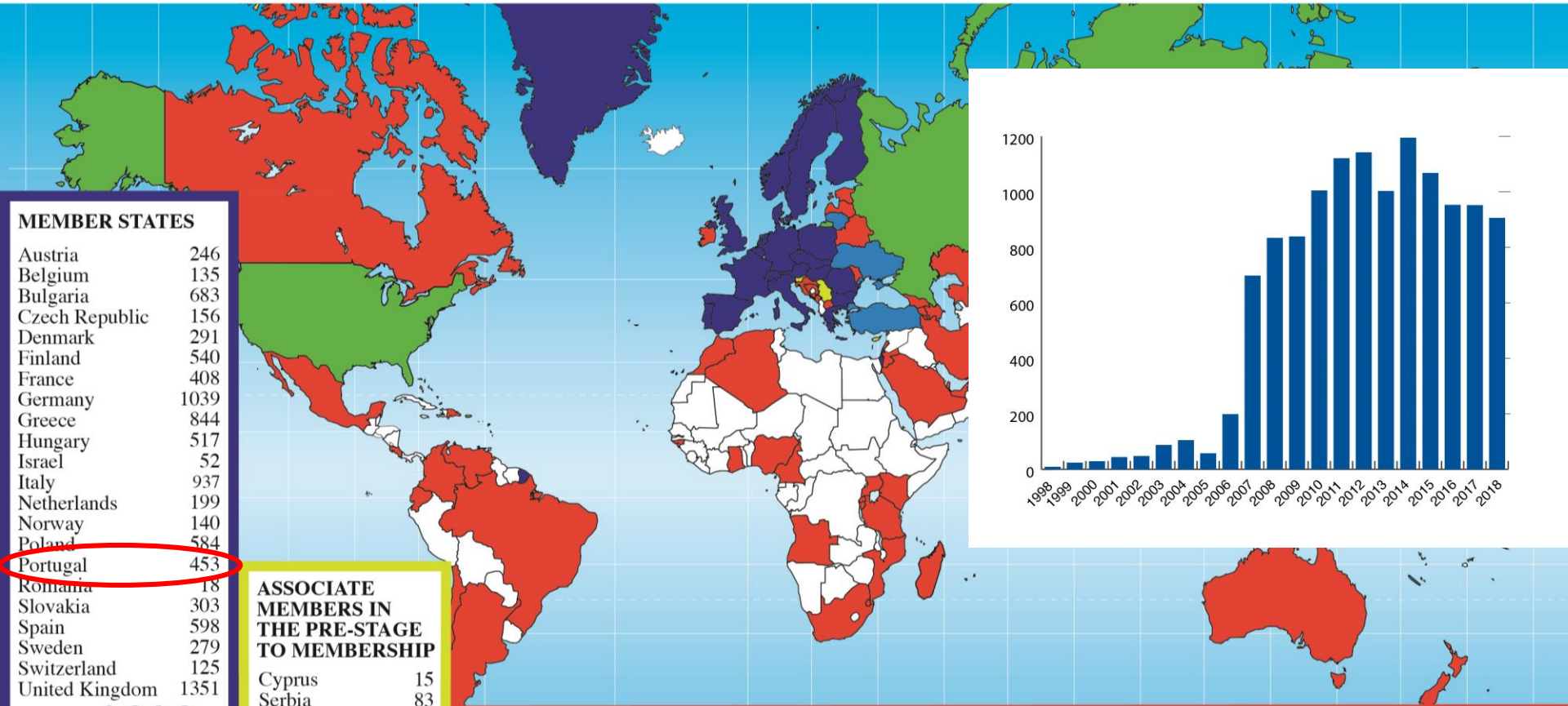
*folheto bolsas FCT*



~200 FCT trainees em 23 anos



# 12 320 Professores do Secundário (1998 – 2018)



| MEMBER STATES   |            |
|-----------------|------------|
| Austria         | 246        |
| Belgium         | 135        |
| Bulgaria        | 683        |
| Czech Republic  | 156        |
| Denmark         | 291        |
| Finland         | 540        |
| France          | 408        |
| Germany         | 1039       |
| Greece          | 844        |
| Hungary         | 517        |
| Israel          | 52         |
| Italy           | 937        |
| Netherlands     | 199        |
| Norway          | 140        |
| Poland          | 584        |
| <b>Portugal</b> | <b>453</b> |
| Romania         | 18         |
| Slovakia        | 303        |
| Spain           | 598        |
| Sweden          | 279        |
| Switzerland     | 125        |
| United Kingdom  | 1351       |

| ASSOCIATE MEMBERS IN THE PRE-STAGE TO MEMBERSHIP |    |
|--|----|
| Cyprus   | 15 |
| Serbia   | 83 |
| Slovenia   | 21 |

**119**

| ASSOCIATE MEMBERS |     |
|-------------------|-----|
| India             | 10  |
| Lithuania         | 54  |
| Pakistan          | 7   |
| Turkey            | 327 |
| Ukraine           | 179 |

**577**

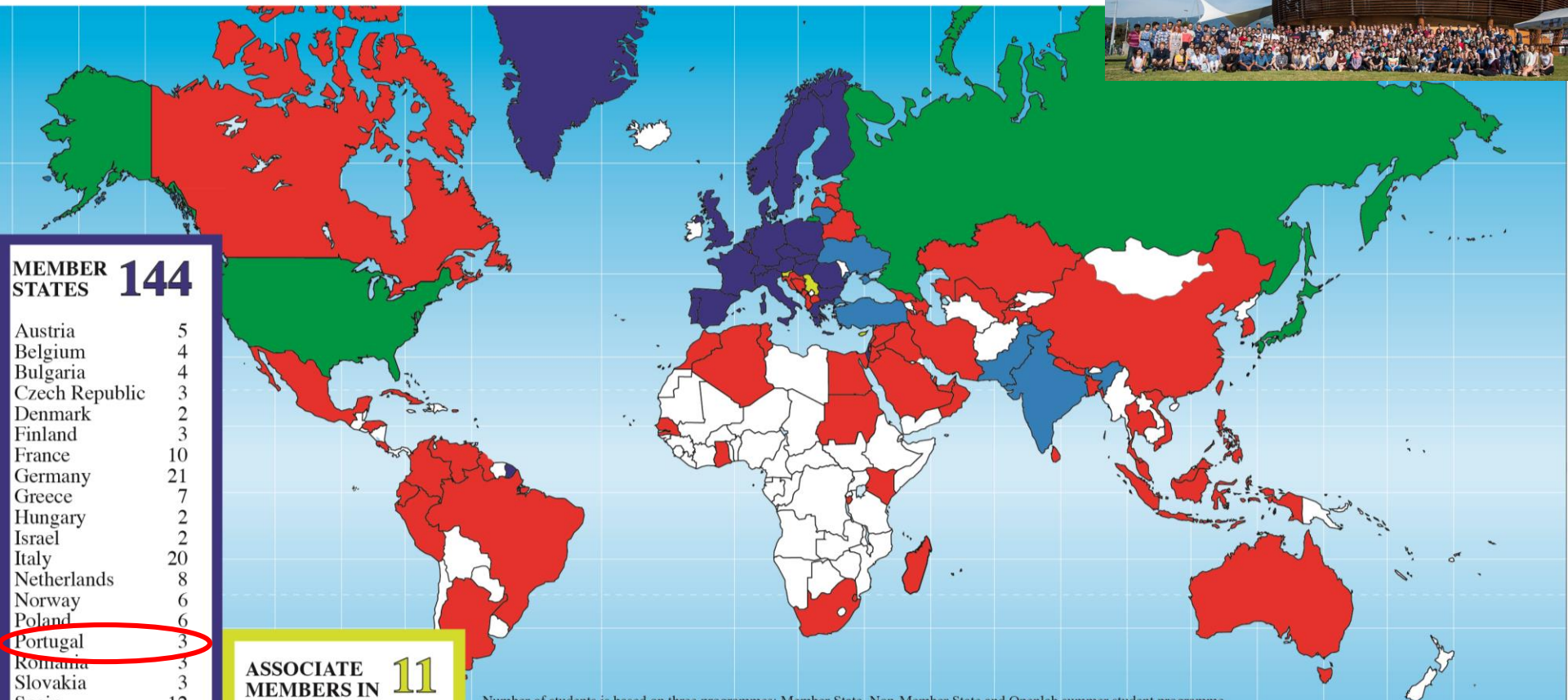
| OBSERVERS |     |
|-----------|-----|
| Japan     | 12  |
| Russia    | 408 |
| USA       | 116 |

**536**

| OTHERS                 |     |                |    |               |     |             |    |                 |    |             |    |
|------------------------|-----|----------------|----|---------------|-----|-------------|----|-----------------|----|-------------|----|
| Algeria                | 10  | Burundi        | 2  | Estonia       | 92  | Lebanon     | 21 | North Macedonia | 13 | Tanzania    | 1  |
| Angola                 | 7   | Cameroon       | 9  | Georgia       | 154 | Madagascar  | 2  | Palestine       | 5  | Thailand    | 19 |
| Argentina              | 2   | Canada         | 14 | Ghana         | 7   | Malta       | 37 | Philippines     | 2  | Timor-Leste | 9  |
| Armenia                | 3   | Cape Verde     | 4  | Guinea Bissau | 1   | Mexico      | 83 | Qatar           | 1  | Uganda      | 3  |
| Australia              | 9   | Chile          | 3  | Indonesia     | 3   | Moldova     | 4  | Rwanda          | 20 | U.A.E.      | 1  |
| Azerbaijan             | 9   | China          | 2  | Iran          | 12  | Mongolia    | 1  | Sao Tome        | 7  | Venezuela   | 1  |
| Bahrain                | 2   | Colombia       | 2  | Ireland       | 9   | Montenegro  | 16 | Saudi Arabia    | 1  |             |    |
| Belarus                | 8   | Costa Rica     | 4  | Jordan        | 13  | Morocco     | 2  | Singapore       | 2  |             |    |
| Bosnia and Herzegovina | 6   | Croatia        | 81 | Kazakhstan    | 14  | Mozambique  | 22 | South Africa    | 8  |             |    |
| Brazil                 | 231 | Dominican Rep. | 72 | Kenya         | 4   | Nepal       | 3  | Sri Lanka       | 2  |             |    |
|                        |     | Ecuador        | 2  | Korea         | 49  | New Zealand | 4  | Swaziland       | 1  |             |    |
|                        |     | Egypt          | 2  | Latvia        | 62  | Nigeria     | 1  | Taiwan          | 1  |             |    |

**1190**

# 337 Estudantes de Verão (2018)



|                      |            |
|----------------------|------------|
| <b>MEMBER STATES</b> | <b>144</b> |
| Austria              | 5          |
| Belgium              | 4          |
| Bulgaria             | 4          |
| Czech Republic       | 3          |
| Denmark              | 2          |
| Finland              | 3          |
| France               | 10         |
| Germany              | 21         |
| Greece               | 7          |
| Hungary              | 2          |
| Israel               | 2          |
| Italy                | 20         |
| Netherlands          | 8          |
| Norway               | 6          |
| Poland               | 6          |
| Portugal             | 3          |
| Romania              | 3          |
| Slovakia             | 3          |
| Spain                | 12         |
| Sweden               | 5          |
| Switzerland          | 1          |
| United Kingdom       | 14         |

|   |           |
|---|-----------|
| <b>ASSOCIATE MEMBERS IN THE PRE-STAGE TO MEMBERSHIP</b> | <b>11</b> |
| Cyprus  | 5         |
| Serbia  | 2         |
| Slovenia  | 4         |

|                          |           |
|--------------------------|-----------|
| <b>ASSOCIATE MEMBERS</b> | <b>25</b> |
| India                    | 12        |
| Lithuania                | 3         |
| Pakistan                 | 5         |
| Turkey                   | 1         |
| Ukraine                  | 4         |

|                  |           |
|------------------|-----------|
| <b>OBSERVERS</b> | <b>35</b> |
| Japan            | 4         |
| Russia           | 8         |
| USA              | 23        |

Number of students is based on three programmes: Member State, Non-Member State and Openlab summer student programme.

|               |                      |   |            |    |                 |   |              |   |            |   |
|---------------|----------------------|---|------------|----|-----------------|---|--------------|---|------------|---|
| <b>OTHERS</b> | Brazil               | 3 | Georgia    | 2  | Kosovo          | 1 | Oman         | 1 | Tajikistan | 1 |
|               | Burundi              | 1 | Ghana      | 1  | Latvia          | 2 | Palestine    | 2 | Taiwan     | 1 |
|               | Albania              | 2 | Canada     | 5  | Lebanon         | 2 | Peru         | 1 | Thailand   | 4 |
|               | Algeria              | 4 | Chile      | 1  | Luxembourg      | 1 | Philippines  | 2 | Tunisia    | 1 |
|               | Argentina            | 1 | China      | 10 | Malaysia        | 3 | Puerto Rico  | 1 | U.A.E.     | 1 |
|               | Australia            | 1 | Colombia   | 1  | Malta           | 3 | Qatar        | 1 | Uzbekistan | 1 |
|               | Azerbaijan           | 3 | Costa Rica | 4  | Mexico          | 2 | Saudi Arabia | 1 | Venezuela  | 1 |
|               | Bahrain              | 1 | Croatia    | 1  | Ireland         | 1 | Singapore    | 2 | Viet Nam   | 3 |
|               | Bangladesh           | 1 | Cuba       | 1  | Jordan          | 1 | Sudan        | 1 |            |   |
|               | Belarus              | 2 | Ecuador    | 2  | Kazakhstan      | 2 | South Africa | 2 |            |   |
|               | Bosnia & Herzegovina | 2 | Egypt      | 3  | Kenya           | 1 | Sri Lanka    | 4 |            |   |
|               |                      |   | Estonia    | 2  | Korea           | 2 | Syria        | 1 |            |   |
|               |                      |   |            |    | North Macedonia | 1 |              |   |            |   |

# careers @ CERN

<http://careers.cern>



| programme                     |          | positions / y | duration | required  | open     |
|-------------------------------|----------|---------------|----------|---|----------|
| Summer Student                | SUMM     | 300           | 3 m      | 3 years of university studies                   | Autumn   |
| Technical Student             | TECH     | 240           | 12 m     | 2 years of university studies                   | Apr, Oct |
| Doctoral Student              | DOC      | 80            | 3 y      | enrolled in PhD in University                   | Apr, Oct |
| Staff                         | STAF     | 100 - 150     | 5 y      | all levels                                      | all time |
| Fellow                        | FELL     | 220           | 3 y      | BSc, MSc or PhD ( < 10 y experience)            | Feb, Sep |
| Marie Curie                   | MC       |               | 3 y      | MSc or PhD ( < 5 y experience)                  | all time |
| Technical Training Experience | TTE      | 40            | 3 y      | superior technician diploma ( < 4 y experience) | all time |
| Trainee                       | FCT-TRNE | 8 - 10        | 2 y      | BSc, MSc or PhD                                 | Sep/Oct  |
| Project Associate             | PJAS     | 40 - 50       | 3 y      | BSc, MSc or PhD                                 | all time |





# Next application deadlines

- Fellowship programme
  - Selection Committee on 19 November
  - Applications until early March – selection in May 2020
  - [cern.ch/fell](http://cern.ch/fell)
- Technical/Doctoral/Administrative student programme
  - *Last committee 9 May 2019*
  - Applications until 21 October; committee 3 December
  - [cern.ch/tech](http://cern.ch/tech), [cern.ch/admin](http://cern.ch/admin)
- Technician Training Experience (open all year round with 3 selection committees per year):
  - Next committee 15 Oct (last: 12 June)
  - Continuously open for applications
  - [cern.ch/tte](http://cern.ch/tte)
- Summer student programme
  - Closed – re-opens in Autumn
  - [cern.ch/summies](http://cern.ch/summies)



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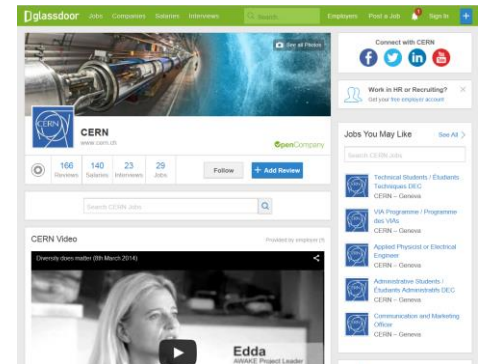
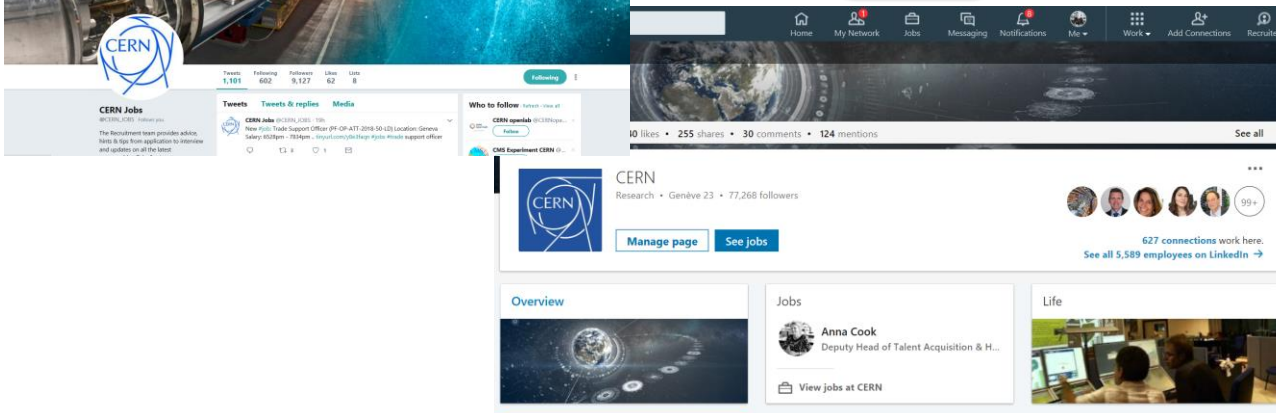
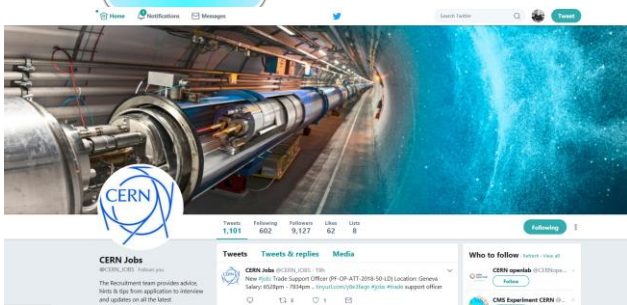
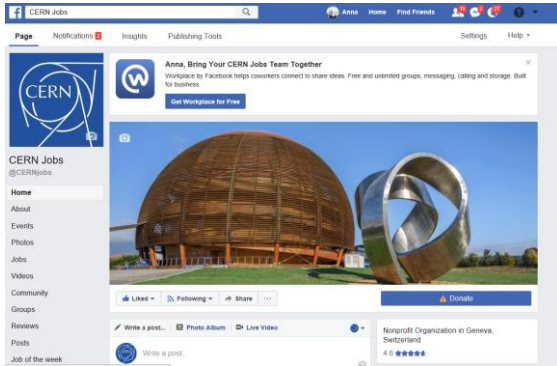


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