

# Mobility of Knowledge Survey 2019



The survey was carried out by Ginevra Tonini and Anna Comini (Park Development and SiS FVG Office - Area Science Park) with the participation of Xavier Ronald Eekhout Chicharro, Fundación Española para la Ciencia y la Tecnología (FECYT) of Madrid

Graphics and layout: Incipit Srl

# Contents

- 1/ The Scientific and Innovation System of Friuli Venezia Giulia – SiS FVG > **pag. 6**
  
- 2/ The survey: methodology and trends
  - 2.1 Analyzed categories and relevant period of time > **pag. 8**
  - 2.2 Foreign students, researchers and teaching staff:  
the 2019 data and the trend for the past few years > **pag. 10**
  
- 3/ Higher education figures
  - 3.1 Students > **pag. 14**
  - 3.2 Researchers and teaching staff > **pag. 18**
  
- 4/ REBECA – The mentoring programme for young researchers > **pag. 24**

*Acknowledgements: the authors wish to thank all the **18 scientific and academic institutions** of Friuli Venezia Giulia which took part in the 2019 “Mobility of Knowledge” survey.*

Area Science Park

CNR - IC Institute of Crystallography

CNR - IOM Materials Workshop Institute

CNR - ISM Institute of Structure of Matter

CNR - ISMAR Institute of Marine Sciences

Conservatory of Music Giuseppe Tartini, Trieste

Conservatory of Music Jacopo Tomadini, Udine

Consorzio Innova FVG Elettra - Sincrotrone Trieste S.C.p.A.

Friuli Innovazione Research and Technological Transfer Centre

ICGEB - International Centre for Genetic Engineering and Biotechnology

INAF - National Institute for Astrophysics - The Astronomical Observatory of Trieste

INFN - National Institute of Nuclear Physics, Trieste

National Institute of Oceanography and Experimental Geophysics – OGS

SISSA - International School for Advanced Studies

The Abdus Salam International Centre for Theoretical Physics – ICTP

University of Trieste

University of Udine





# The Scientific and Innovation System of Friuli Venezia Giulia – SiS FVG

**SINCE AUGUST 2016, SiS FVG** has represented the joint networking initiative of the research institutions of Friuli Venezia Giulia, established on the basis of a Programme Agreement signed by the Ministry of Foreign Affairs and International Cooperation (MAECI) and the Ministry of Education, University and Research (MIUR) and the Regional Authority, which further strengthens and integrates the content of the previous agreement from 2004.

The goals of SiS FVG are:

- ◆ Implement a “scientific network of excellence” which is to strengthen the competitiveness of the local territory at a national and international level
- ◆ Optimize actions that valorize innovation as well as scientific and technological research

- ◆ Promote services in support of the internationalization of research centres
- ◆ Disseminate and spread technical-scientific and innovation-related knowledge

The Friuli Venezia Giulia region is one of the main European “hubs” for science and technology, featuring international research facilities and hosting a quite large and vibrant community of foreign researchers and students. The network comprises 18 entities, including universities, research centres, national and international organizations, scientific and technological parks and state music conservatories. Therefore, SiS FVG is a strategic initiative aimed at valorizing this specific regional asset to increase the social and economic benefits of research activities for the local territory.



The system aims to implement **projects and activities in order to enhance the scientific network** such as the infrastructure devoted to HPC - **High Performance Computing** to reinforce the regional primacy in the field of high performance computing and the **Advanced Mechatronics Laboratory** - Lama FVG, so as to enhance the transfer of knowledge at the applicative and industrial level.

The network's attractiveness is further supported by the framework agreements of the Friuli Venezia Giulia Autonomous Region with the European Association within the "**Ambient Assisted Living**" Programme - AAL and the Joint Research Centre of the European Commission - JRC, as well as exchange and scientific collaboration programmes such as the project developed with **MIT** - Massachusetts Institute of Technology. In order to foster the strengthening of regional competitive-

ness and build a structured system of private enterprises and public operators able to generate economic development, a complex project named "**Argo System**" was specially developed, the activities of which focus precisely on industrial development, digital transformation, research and development platforms and business creation.

Finally, to strengthen the internationalization of its centres, through the **Welcome Office FVG**, SiS FVG has implemented a meeting-point front office to welcome international students and researchers.

The list of activities and strategic planning initiatives of SiS FVG can be found on the website [www.sisfvg.it](http://www.sisfvg.it), which also offer information and data on the partners in Italian and English, that can be downloaded and shared in an open-data perspective.

# > 2 / **The survey: methodology and trends**

## > 2.1

### **Analyzed categories and relevant period of time**

**"MOBILITY OF KNOWLEDGE"**<sup>1</sup> is a survey carried out annually by the Park Development and SiS FVG Office - Area Science Park to monitor the attractiveness of the regional Scientific and Innovation System by recording the number of foreign researchers and students present at regional entities, universities and music conservatories. A further objective for the survey is to identify the nationalities and


the scientific areas of reference for incoming researchers, students and teaching staff who choose one of the centres belonging to SiS FVG to carry out their activities, even for short periods of time.

This year, the survey saw the participation of **13 research centres, 3 universities and 2 music conservatories.**

The data collected refer to the following categories:

- students enrolled in regional universities and music conservatories
- foreign students who spent a study period in the region (incoming mobility, e.g. Erasmus+)
- students enrolled in regional universities and music conservatories who spent a study period abroad (outgoing mobility)



- 
- professors (only 1st and 2nd category) and researchers working for the institutions (including temporary research fellows and research collaborators)
  - foreign researchers and professors who worked in the region for a period of time (incoming mobility)
  - professors (only 1st and 2nd category) and researchers employed by the institutions (including temporary research fellows and research collaborators) who carried out their activities abroad for at least 1 month (outgoing mobility).

In addition, for each category, the nationality of the subjects involved, the discipline or scientific area of reference and the geographical area of destination (for outgoing flows) were recorded.

The relevant period of time was:

- the 2017/2018 academic year for students
- data as of 31.12.2018 for researchers and teaching staff working for the institutions
- the entire year 2018 for incoming and outgoing researchers and teaching staff and for the research collaborators working for the institutions

The questionnaires were submitted via email and filled in independently by the reference people of each institution, who could count on the support of the Park Development and SiS FVG Office staff.

---

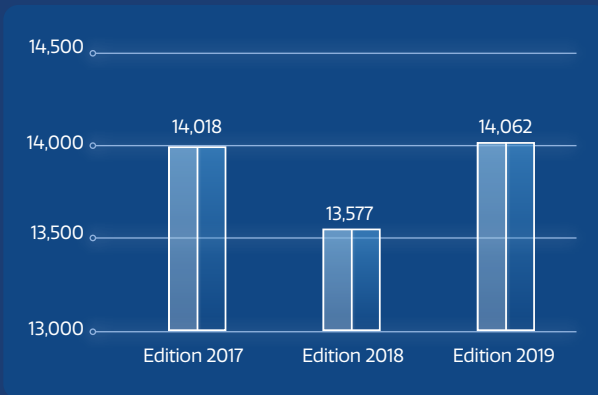
1 - Use of the data, collected and processed by the Park Development and SiS FVG Office, is authorized by citing the source.

## > 2.2

### Foreign students, researchers and teaching staff: 2019 data and the trend of the past few years

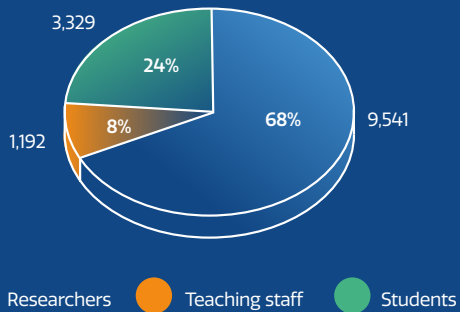
**TO BETTER UNDERSTAND** the international trend in incoming or enrolled foreign students, researchers and teaching staff over a specific period of time across the regional territory, we compared the data from the past few years.

Going through the past three surveys, we discovered that the **overall number of foreign** students, researchers and teaching staff, after a decrease in 2018, went back to **14.000 units** (*Chart 1*). Therefore, the System still retains a good degree of attractiveness in terms of international presence, also thanks to the expertise of the welcome and hospitality services that keep supporting this target.



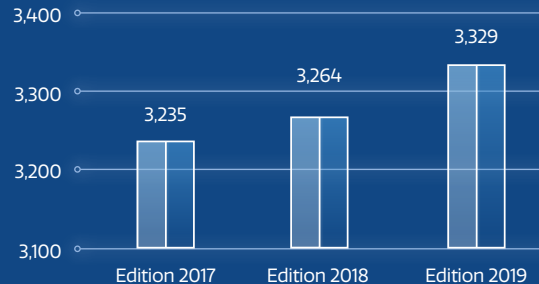
**CHART 1: Trend in the overall number of foreign students, researchers and teaching staff**

When looking at the single categories that make up the international component (*Chart 2*), in line with the previous year, **researchers account for over two thirds** (68%), followed by students (24%) and teaching staff (8%).



**CHART 2: Overall number of international users by category (2019 edition)**

Over the past few years, the **overall number of foreign students** who enrolled in universities and conservatories or spent a period of study in the region remained fairly stable recording approximately 3.200 units, whereas in



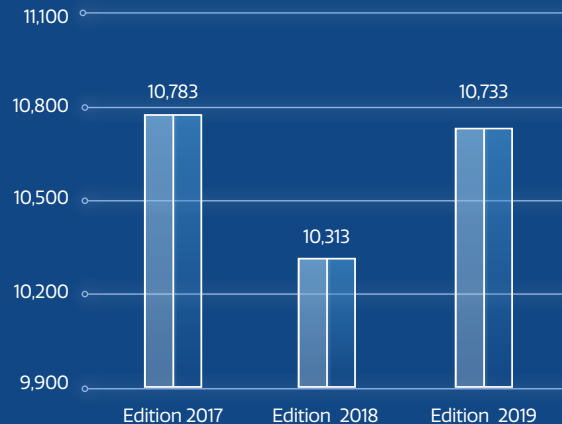
**CHART 3: Overall number of foreign students (enrolled and incoming)**

the 2019 survey it reached **3.300 units** (Chart 3). However, their percentage out of the total number of students enrolled remained stable at 7.8%.

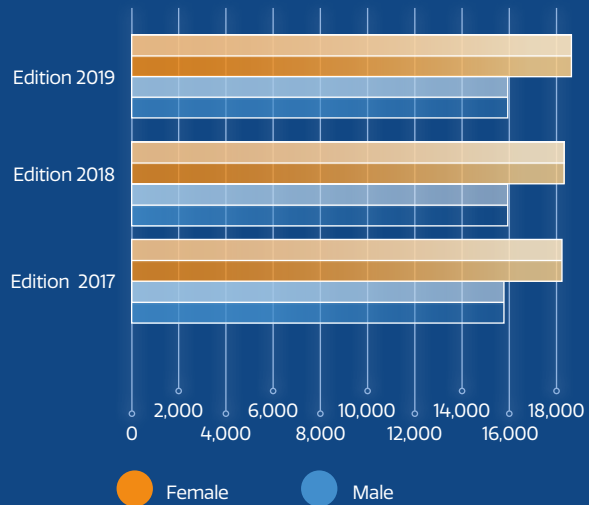
After reporting a decline in 2018, the **overall number of foreign researchers and teaching staff** employed at the entities or who carried out part of their activity at a regional scientific institution went back to being in line with the data recorded in 2017, reaching approximately **10.700** units (*Chart 4*).

In conclusion, it is possible to say that the data collected on the presence of foreign students (enrolled and incoming) testify to the attractiveness of the regional universities and conservatories. With regard to the foreign researchers and teaching staff who work at regional institutions or carried out part of their activity in the region, after a decline reported last year, their number increased again, going back to the 2017 figures. In particular, incoming researchers made up the largest share, followed by those employed by the institutions.

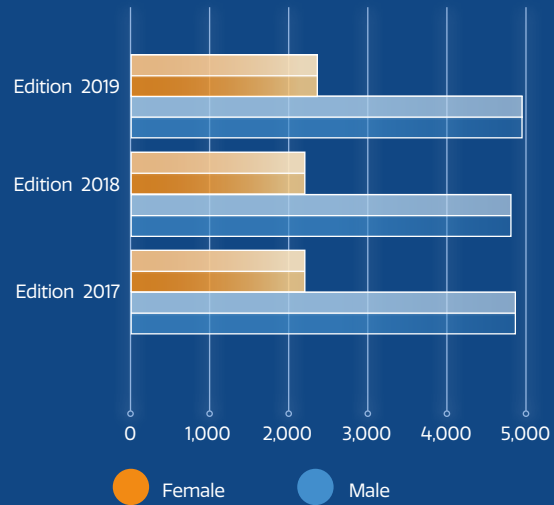
Finally, looking at data on gender, there were not significant changes in the student category (*Chart 5*) as well as in the researcher and teacher category (*Chart 6*). As the charts reveal, females account for more than half the sample when the students enrolled in universities and conservatories are considered, whereas they decrease to about one third when researchers and teachers are considered.



**CHART 4: Overall number of foreign researchers and teaching staff (employed at the entities and incoming)**



**CHART 5: Gender distribution of enrolled students**



**CHART 6: Gender distribution of researchers and teaching staff**

> 3

## Higher education figures

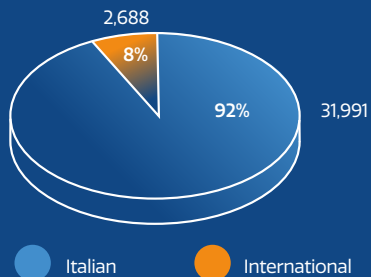
### > 3.1 Students

**LOOKING MORE CLOSELY** at the 2019 data concerning students, the three universities and the two conservatories reported **34.679 students enrolled** overall (*Chart 7*). This figure recorded a slight increase on the previous year, especially thanks to the number of students enrolled in master's degree courses and, more in general, in the post-graduate degree and specialization courses. With respect to foreign students, as also mentioned in the previous

section, the percentage of enrolled units is equal to 7.8%, a figure which is in line with the trend of the past few years. On the other hand, the number of people who spent a period of time in the region (incoming mobility) slightly increased, from 580 to 641 units. Overall, the **foreign students** in the 2017/2018 academic year amounted to **3.329 units** (enrolled and incoming students).

When looking exclusively at music **conservatories**, the share of enrolled foreign students went from 22% to 24%, thus testifying to the particular attractiveness of these institutions within the regional context.

Moving to the **scientific areas**<sup>2</sup>, there were no changes versus the previous survey. A 46% share of students chose Social Sciences and Humanities, followed by Life Sciences



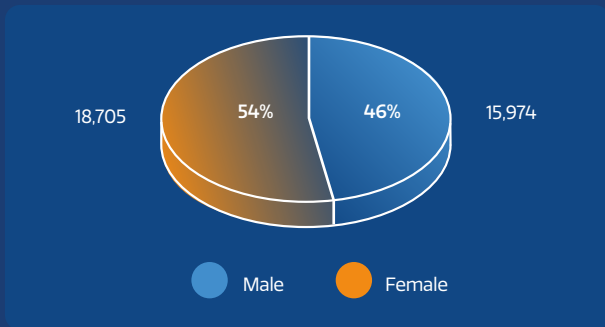
**CHART 7: Students enrolled in universities and conservatories**

with a share of 28% and the macro area comprising Mathematics, Physical Sciences, Information and Communication, Engineering, Universe and Earth Science which accounts for the remaining 26%.

The ratio between **male and female** enrolled students also remained unchanged (*Chart 8*). Female students were still the majority of the total sample with a share of 54%.

---

2 - The division of the scientific areas is based on the ERC macro sectors (Social Sciences and Humanities –SH, Mathematics, physical sciences, information and communication, engineering, universe and earth sciences – PE, Life Sciences – LS)



**CHART 8: Distribution of students enrolled in universities and conservatories**

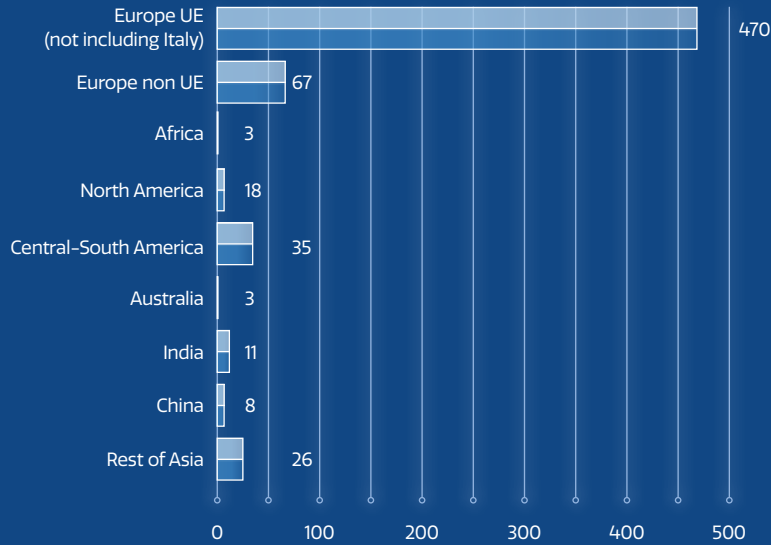
With regard to the **nationality** of the foreign students who spent a period of study in the region (*Chart 9*), EU countries prevail - especially thanks to the Erasmus+ programme - accounting for 73% of this target, namely 470 units. Finally, in relation to the **scientific area** of reference for the incoming students, Social Sciences and Humanities are still prevailing.

Moving forward on outgoing mobility, there were **1.290 students** (of whom 802 were females) who **spent a period of study or training abroad**. They account for 3.7% of the total enrolled students, in line with the records from the previous survey. Also the **destinations** chosen remained unchanged: EU countries still prevail, hosting 85% of the students under the Erasmus+ programme. They are followed by non-EU European countries, which are a destination for 6% of the students, and North America, chosen by 5% of them.

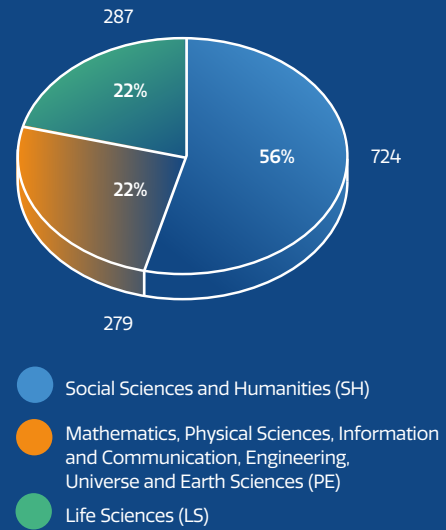
With respect to the scientific areas of reference for outgoing students, Social Sciences and Humanities prevail with 56% of the total, followed by Life Sciences and the macro area comprising Mathematics, Physical Sciences, Information and Communication, Engineering, Universe and Earth Science which account for 22% each (*Chart 10*).

Overall, the data collected in this survey on the various categories of students (enrolled, incoming and outgoing) are in line with the previous year, thus confirming the fair degree of attractiveness of the regional higher education system.





**CHART 9: Nationality of the students who spent a period of study in the region (incoming mobility)**



**CHART 10: Scientific areas of reference for the students who went abroad (2017/2018 academic year)**

## > 3.2

### Researchers and teaching staff

**MOVING ON TO THE ANALYSIS** of the data relating to Italian and foreign researchers and teaching staff at regional scientific institutions, it should be pointed out that their number increased versus the previous year, from 7.049 to 7.320 units (*Chart 11*). This is mainly due to an **increase in the foreign component**, which went from 3.837 to 4.047 units, whereas the number of Italians remained stable.

Looking exclusively at the foreign researchers and teaching staff at the institutions, over the past few years their number was roughly 3.800 on average, whereas this year saw a slight increase, reaching the threshold of 4.000 units.

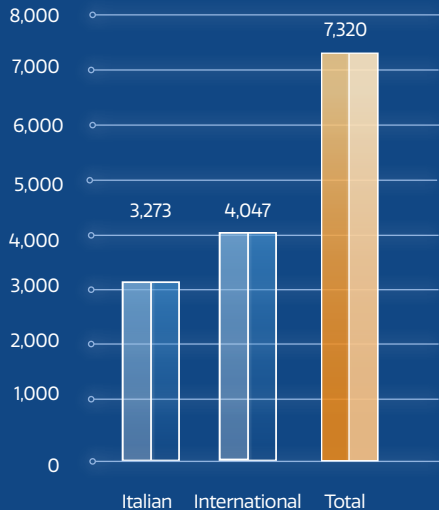
With regard to the **nationality** (*Chart 12*), the Italians working at regional institutions amount to 3.273. Asian countries (excluding India and China) rank second with

824 units, while Africa comes in third place: with an increase on the previous year, it is now the place of origin for 792 units, thus exceeding EU countries which “only” account for 753 people. The remaining lands of origin of researchers are Central and Latin America (589), India (410), North America (248), non-EU European countries (244), China (177) and finally Australia (10). On the other hand, teaching staff come almost exclusively from Italy.

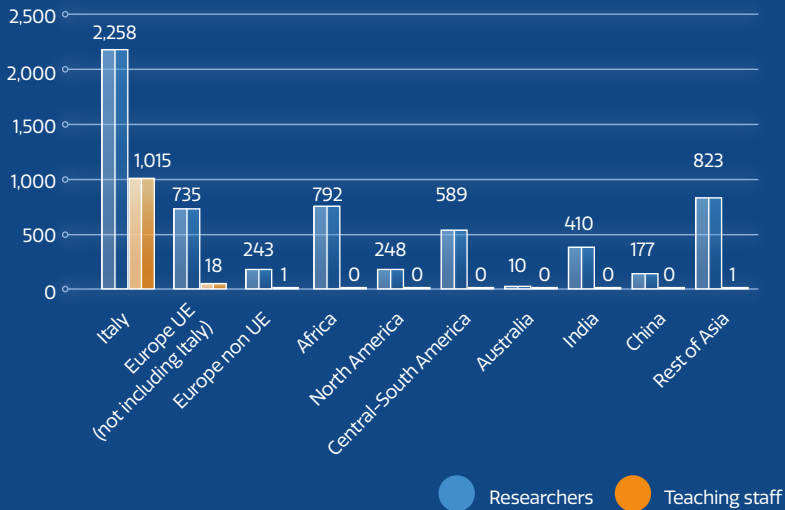
Mathematics, Physical Sciences, Information and Communication, Engineering, Universe and Earth Science is still the prevailing **scientific area** in this target, accounting for 5.539 units, followed by Life Sciences (1.001 units) and Social Sciences and Humanities (783 units).

Also the **gender ratio** remains unchanged, with female researchers and teachers (*Chart 13*) accounting for one third of the entire sample.

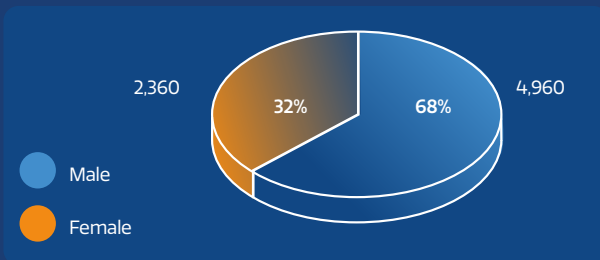
Looking at the number of foreign researchers and teaching staff arriving in the regional territory, including for short periods (*Chart 14*), the teaching staff account for slightly less than one fifth of the sample (18%), a figure in line with the previous survey.



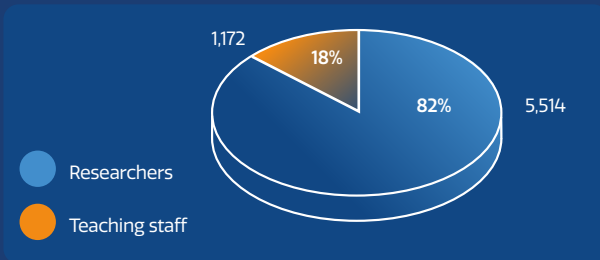
**CHART 11: Researchers and teaching staff at the institutions**



**CHART 12: Nationality of researchers and teaching staff at the institutions**



**CHART 13: Gender distribution of researchers and teaching staff**



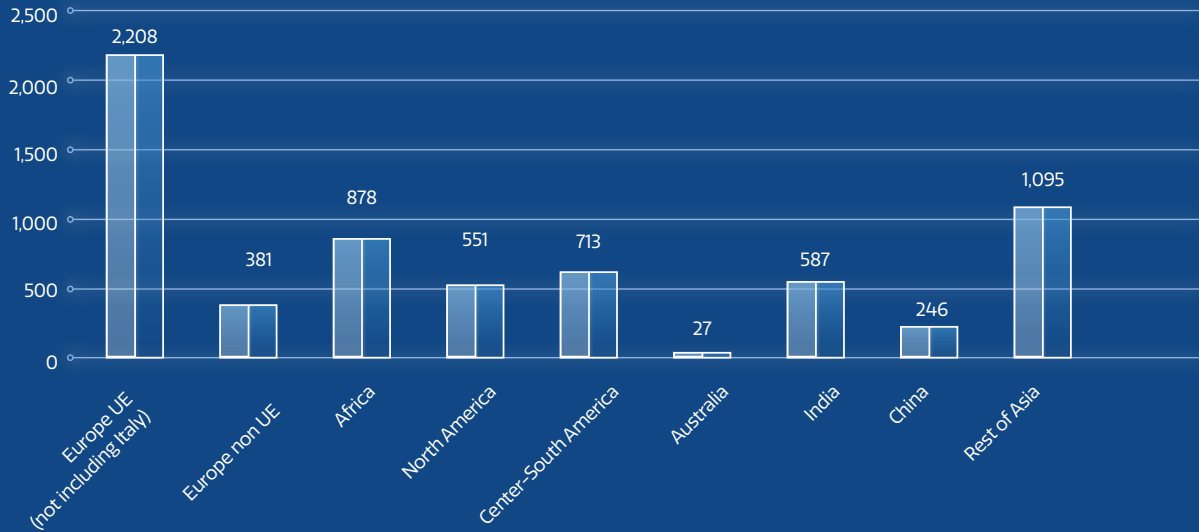
**CHART 14: Incoming foreign researchers and teaching staff**

The total number of **incoming researchers and teachers** - after a decline in 2018 - has now increased, moving from 6.476 to 6.686 units.

Overall, this survey showed that the international component recorded an increase in terms of foreign people employed at regional institutions as well as those staying only for a short period. In particular, the figures relating to **incoming mobility for periods shorter than one month**, which means foreign people participating in events or courses promoted by regional scientific institutions, have been consistent.

In addition, the foreign teaching staff who worked for a short period (less than one month) at conservatories alone amounted to approximately 19% when compared to the total teaching staff employed at the two institutes.

When looking at the **nationality** of researchers and teaching staff who spent a period of work in the region (*Chart 15*), EU countries still prevail with 2.208 units, thus confirming the data from last year. Excluding Europe (i.e. both EU and non-EU countries), Asian countries (excluding India and China) still rank first



**CHART 15: Foreign researchers and teaching staff who spent a period of work in the region**

in terms of **countries of origin for incoming researchers and teaching staff**, with 1.095 units. They are followed by Africa, moving from 689 to 878 units, Central and Latin America, which saw an increase from 574 to 713, and India, which accounts for 587 units, thus exceeding North America (551) and China (246). Australia is still the least represented region, with a share going down from 38 to 27 units.

When looking at the **scientific area** of this target, the macro area of Mathematics, Physical Sciences, Information and Communication, Engineering, Universe and Earth Science prevails as usual.

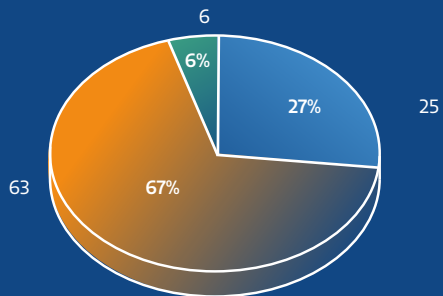
With regard to outgoing mobility, the number of **researchers and teaching staff who went abroad** in 2018 to carry out their activities, overall the figure remained steady versus the previous year (94 units). However, it should be said that this figure is definitely underestimated, given the difficulty of the institutions in mapping this type of mobility. The **main destinations** are still EU countries (54%), followed by North America (23%). The third destination this year is Asia (excluding China and India) which accounts for 7%, followed by Central

and Latin America (6%), non-EU European countries (5%), China (3%) and finally Australia (2%).

Mathematics, Physical Sciences, Information and Communication, Engineering, Universe and Earth Science are the reference subjects for as much as 67% of those who leave to work abroad. Social Sciences and Humanities and Life Sciences follow with 27% and 6% respectively (*Chart 16*).

Funds from the institutions and EU funding programmes such as Horizon 2020 still are the main resources to support the activities of researchers and teaching staff abroad.

Overall, after a decline in 2018, the number of **incoming foreign researchers** has now started to grow again, moving from 5.249 to 5.514. The largest increases were reported among researchers from Africa and Central-Latin America.



- Social Sciences and Humanities (SH)
- Mathematics, Physical Sciences, Information and Communication, Engineering, Universe and Earth Sciences (PE)
- Life Sciences (LS)

**CHART 16: Scientific areas of researchers and teaching staff who went abroad in 2018**





## REBECA – The mentoring programme for young researchers

**EURAXESS – RESEARCHERS IN MOTION** is an initiative by the European Commission to promote the careers of researchers and favour their mobility across Europe through free-of-charge personalized services. The network comprises over 500 offices and a staff of more than 1,500 people, with branches mainly located in Europe, but across the rest of the world as well (e.g. Asian countries, North America, China, India, Japan and South America).

The mentoring programme entitled REBECA – *REsearchers BEyond aCAademia Mentoring Programme* is one of the actions developed by the project named **EURAXESS TOP IV** “*Open EURAXESS - To strengthen the effectiveness and optimize the services of all partners in an innovative and open EURAXESS network*”, funded by H2020, the goal

of which is to enlarge the type of services devoted to researchers, in particular with reference to the issues connected with career development, job opportunities beyond the academic field and, more in general, scientific entrepreneurship. REBECA will have a term of six months, from July to December 2019, and will be experimentally implemented in Italy, Spain, Bulgaria, Denmark and Israel. We asked **Xavier Eekhout Chicharro**, specializing in International projects at **Fundación Española para la Ciencia y la Tecnología – FECYT**, coordinating the programme, to briefly illustrate its main characteristics.





### **What are the main goals of REBECA and to whom is it addressed?**

This mentoring programme is primarily aimed at early stage researchers in academia. Its intention is exposing them to professional alternatives beyond the traditional academic career by pairing them with highly skilled professionals in different business sectors.

Nevertheless, we also think that there is potential benefit for the mentors too, because this is an opportunity to network with young professionals currently working in the academic world.

### **Why is REBECA specifically addressed to this target?**

Although the number may change from country to country, it is clear that only a very small percentage of

researchers who start their PhD will be able to have a full professional career within academia, although different sources highlight that this is the intention of a majority of early stage researchers. Through this mentoring programme we are seeking to complement the information on professional alternatives a researcher has. It is very important to highlight that REBECA is by no means trying to promote researchers on moving out of academia, but to raise awareness among them about all the alternatives that are “out there” in order to help them manage their career development in a more efficient way. In addition, different studies have highlighted that an important barrier for intersectoral collaboration in R+D+I has to do with a certain level of distrust between academic organizations and business organizations,

in many cases based on false assumptions, so we think that establishing these kind of personal connections between both worlds could also contribute to overcoming this barrier.

### What are the activities foreseen during the programme?

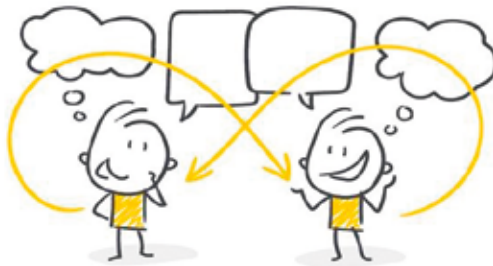
Obviously the core content of the mentoring programme are the mentor-mentee meetings themselves. In this sense, as part of the material to facilitate the process

we have provided all participants with a handbook that suggests topics and related material to have at least 6 meetings along the 6 months of the pilot. Nevertheless, flexibility is at the core of REBECA and pairs are welcomed to move out of these and address other issues related to researchers beyond academia that could be more relevant to them. In line with the content of this handbook, a live online launching session was organized to facilitate both mentees and mentors to start on the same foot before the beginning of the 6 month period.

**RESEARCHERS  
BEYOND  
ACADEMIA  
MENTORING  
PROGRAMME**

euraxess   
RESEARCHERS IN MOTION

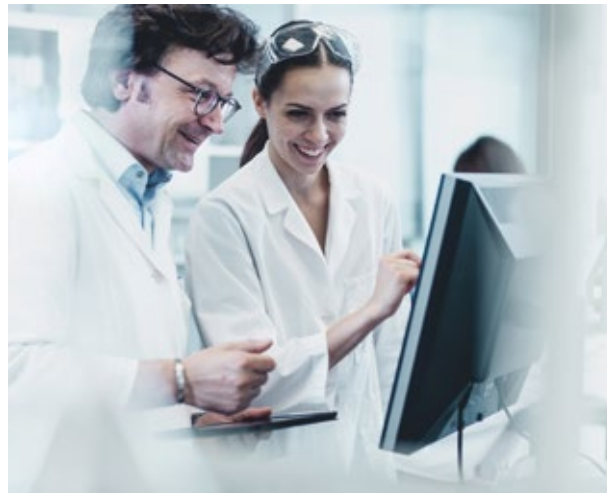
BEYOND THE BENCH



Furthermore, two more online training sessions are planned as part of the programme specifically for the mentees. One of them focused on professional alternatives beyond academia for researchers, and the other one on tips to prepare non-academic CVs putting researcher skills in value. In the case of the mentors, REBECA is also offering the possibility of setting an *ad hoc* on-line seminar for those interested in sharing their experience as mentors to support their involvement in the programme.

In particular, **the Italian section of the programme** has heavily focused on the entrepreneurial aspects, dealing with subjects such as business developments, patents, the creation of startups and offering the mentees further *ad hoc* workshops featuring experts to address such aspects, suggested by the users themselves. Indeed, the mentors involved are mainly entrepreneurs with previous work experience as researchers or professionals with specific experience on the subjects requested by the mentees. On the other hand, the latter are young researchers, half of whom are completing their PhD course. The ultimate goal of this programme therefore is providing researchers with further knowledge and instruments, including the

Euraxess centres, to best direct their professional career, for those who want to continue their path in the academic world as well as those who want to start their own business or, more in general, move to the industry sector.





**SIS  
FVG**

REGIONE AUTONOMA  
FRIULI VENEZIA GIULIA

SCIENTIFICO  
AND INNOVATION SYSTEM  
OF FRIULI VENEZIA GIULIA

