



European Solar Physics Community Demographics & Research Interests

In spite of the fact that researchers gather together regularly in international conference and related events, a census of European researchers in Astronomy does not exist, in particular for the Solar Physics community. Although initial estimates give a number of about 500 scientists working on this field, there is not statistics of, among others, geographical distribution, gender or degree of experience. This document summaries a first analysis of the demographic and research interests for this community.

Background

This report presents the results of a study of the demographic, research interests of the European Solar Physics Community carried out over the spring of 2016, as part of the activities of GREST (Getting Ready for EST) project, coordinated by the Instituto de Astrofísica de Canarias (IAC).

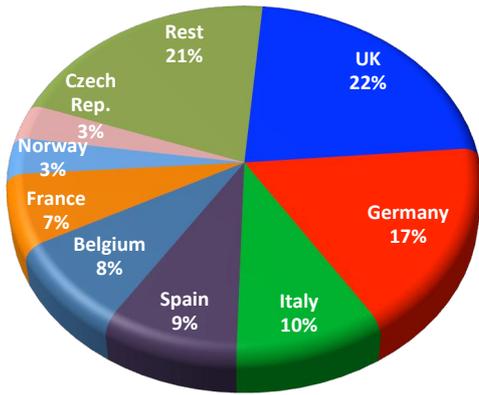
The current study comprised two main parts. In the first one, groups/institution heads were asked to update and complete a breakdown of staff working in solar physics by gender, experience and position. The second part of the study collected data directly from individuals using a questionnaire about the research interests of individuals and their vision on the European Solar Telescope (EST) impact, chosen recently as Strategic Scientific Installation for Europe. EST is a project to construct the largest solar telescope in the world, to be sited at the Canary Island Observatories.

Methodology

IAC has a large amount of information of the Solar Physics Community thanks to its continuous contact with many universities and research centers across Europe as a result of the Canarian observatories management, as coordinator of many European related projects as EST-Conceptual Design, SOLAIRE, SOLARNET, GREST, etc. or its active participation in the EAST association.

All this information has been used to prepare a first census, which was later updated with the information available in the webpages of each one of the identified research groups. Finally, the census was updated/completed by the heads of those research groups while the individuals were asked to complete the aforementioned questionnaire.

Last, we have also carried out a rough statistic analysis of the number of refereed publications of the community in the last decade.

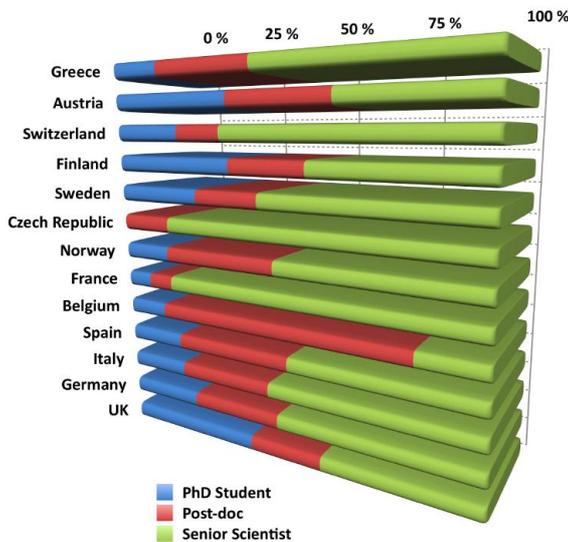
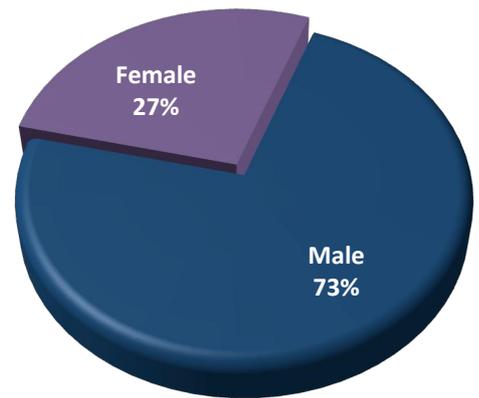


The total number of researchers in Solar Physics in Europe is 615

Although this number is slightly larger than initially expected, it may be even higher since we did not receive information from some groups. Also, we have not take into account the technical staff working in the field, which for some institutions is quite high. The three first countries (UK, Germany and Italy) represent close to 50% of the solar community, and the first 8 countries concentrate around 80% of the total. The five largest research centres in Europe are the Max Planck Institute for Solar System Research, the Royal Observatory of Belgium, the Kiepenheuer Insitute for Solar Physics, the Instituto de Astrofísica de Canarias and the University of St. Andrews.

The proportion of female staff is 27%

It is interesting to note the proportion of female researchers varies with research position, in such a way it decreases with seniority. Thus, this ratio is 36,8%, 31,7% and 20,6% for PhD Students, Post-docs or Senior Scientists respectively. The proportion of female staff of the Solar Community is similar (27%) to that found in the RAS Demographic Survey carried out in 2011 and more than double for the SDP of the American Astronomical Society (AAS/SPD) in 2015.

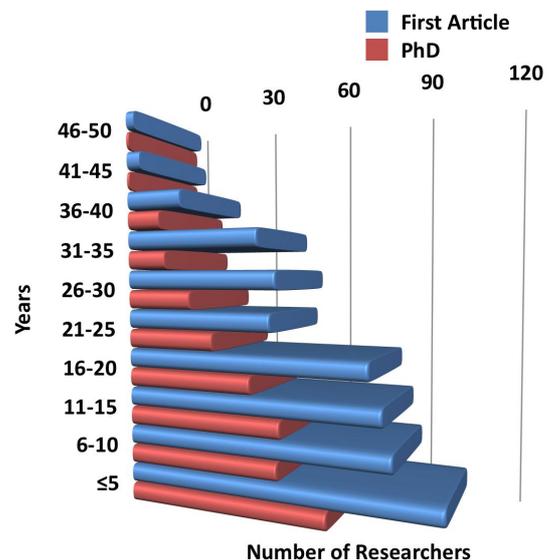


The Solar Community is comprised of 52% of Senior Scientists, 26% of Post-docs and 22% of PhD Students

Research centres were asked to breakdown their staff data by position, and discern between permanent staff (Senior Scientists) and fixed-term position, either as Post-doc or PhD Student. The proportion of researchers for each position is: 52% for Senior Scientists, 26% for Post-docs and 22% for PhD Students.

However, this proportion shows a clear variation from country to country. Thus, UK is has the larger number of PhD Students (38%), while France and Czech Republic show the larger proportion of Senior Scientist, close to 80% (see left panel).

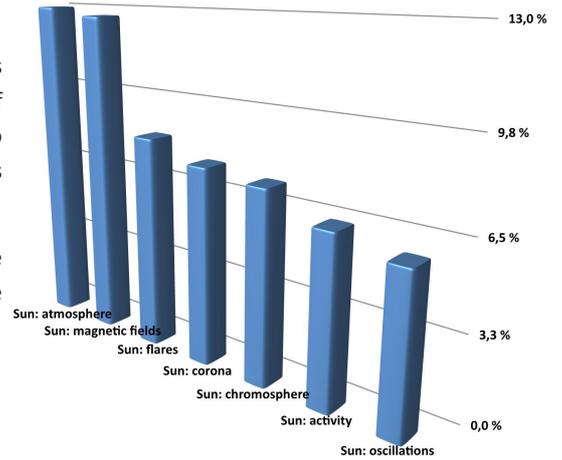
The right hand panel shows the years since the respondents presented his/her PhD (red) or published his/her first referee article (blue). For clarity purposes, the data have been grouped in blocks of five years. Unfortunately, both indicators were not always available for all the researchers, leading to different size of the horizontal bar. Please note also, many PhD students have not yet published any article, which result in a shorter bar for the first block of 5 years. Even so, one can clearly see a similar shape to a demographic pyramid for a growing population in both indicators, which are in principle coherent.



Research interests of the solar community

Respondents were asked to indicate up to two research areas across the keywords commonly used in refereed publications for topics related to the Sun. The popularity of each research area was then judged by summing the number of respondents who indicated an interest in that area. Around 64% of the respondents replied to this question.

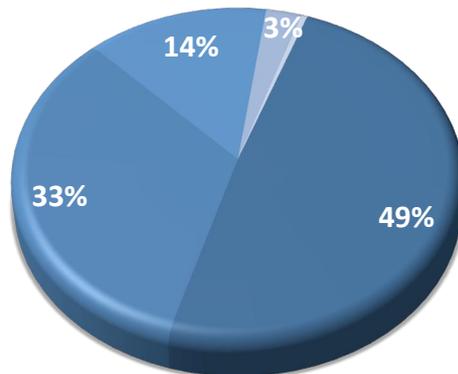
The most popular areas within solar physics amongst the European solar community are atmosphere (13%), magnetic fields (13%), flares (8%), corona (8%) and chromosphere (7%).



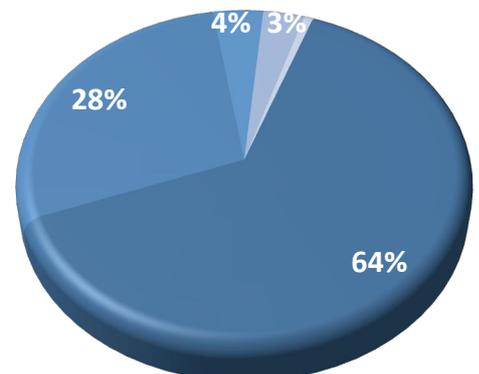
EST impact

The respondents were asked two final questions regarding the interest on EST and the impact of its future observations on their respective research lines. In particular, the questions and the possible responses were the following, 1) *How would you rate your scientific interest in EST?* and 2) *Would your research benefit directly or indirectly from EST?* More than 80% of the Solar Community considers the scientific interest of EST is either “Extremely Important” or “Very Important”. Moreover, around 90% of the respondents think their research lines will “Definitely” or “Probably” benefit from EST observations.

- Extremely Important
- Very Important
- Somewhat important
- Not very important
- Not at all important



- Definitely
- Probably
- Probably not
- Not sure
- Definitely not



Around 41% of the refereed publications in Solar Physics for the period 2005-2015 count with the participation of European researchers

Last, we have also analysed the number of refereed publications for all the European countries in the last 10 years (2005-2015), as well as the publications from other communities: USA, Japan, India, Korea, China and Russia. Around 41% of the total publications (left hand panel) in solar physics counted with the participation of at least one European researcher. This number is slightly larger than that for USA. The production of the European community has increased in the last 10 years, and it is close to 500 refereed papers, slightly above of USA production. China is in the third position, with a total of 8% of the production in the last decade.

