

## About this project

“Diversity in the Cultures of Physics” is an Erasmus+ funded strategic partnership between six university physics departments in Germany, Sweden, Spain and the UK. It aims to identify and address some of the causes for low numbers of women in academic physics research in these countries.

The project’s three strands are:

- 4-week international summer schools for female physicists transitioning from Undergraduate/Masters to PhD study
- Creating teaching materials for university workshops and seminars around gender and physics
- Comparing physics outreach activities between the partner countries in order to recommend how this could be made more inclusive

The suggestions provided in this flyer are based on the observations made on mutual shadowing visits of outreach events among the project partners in UK, Spain and Germany and on discussions with attendees of the “Science in Public 2019” conference (Manchester, UK) where the project and some outreach activities from other institutions have been presented.

<https://tinyurl.com/diversephysics>



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## Checklist

- Do the images and examples of scientists in your talk or activity showcase a range of diverse people?
- If you need to monitor the gender of people who attended your event, have you put an inclusive system in place to collect this information (rather than assuming you can tell by looking)?
- Have you highlighted a range of real-world applications?
- Have you thought about how you’re going to handle questions, ask for volunteers, or assign roles in group work?
- Have you included a variety of activities or styles of teaching?
- Has everyone delivering the activity either received training in or been briefed on diversity & inclusion?
- Are there role models in your event, e.g. in the people delivering the activity or highlighted in your examples?
- Have you thought about inclusivity beyond gender—such as how accessible your event is to people with disabilities? Or representation of role models from ethnic minority groups?

# Making physics outreach more gender inclusive



The University of Manchester



The University  
Of Sheffield.



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BARCELONA



Universitat Autònoma  
de Barcelona



UPPSALA  
UNIVERSITET

## Physics outreach

### **Who is this leaflet for?**

If you work in physics in a university or other educational institution, you may already participate in or lead on outreach and public engagement activities: communicating physics research and study to non-specialist audiences outside academia. While there are many potential audiences and reasons for doing outreach, this flyer addresses outreach practitioners who are working with children and young people (under 18), either in a school setting or informal science learning environments (science festivals, science centres, activity clubs etc.).

### **Why gender-inclusive outreach?**

Since women are underrepresented in most countries in many fields of science, especially physical sciences (see many sources including <http://uis.unesco.org/en/topic/women-science>), one goal of university outreach activities is to encourage young people, and women in particular, to study and eventually work in science. The long term aim is to improve gender equality in university and beyond.

### **Does this mean I need to run girls-only events?**

No, hosting girls-only events is only one of many options for making your outreach more inclusive for girls. If you intend to run girls-only events for particular issues, you can collaborate with one of the many organisations that aim at increasing the number of girls in STEM. However, the idea of this flyer is to revise existing outreach activities in physics for a more diverse audience, specifically with regard to gender.

We suggest that all physics outreach activities can be made more inclusive rather than creating a divide between “outreach” and “outreach for girls”.

## What to do and what to avoid for gender inclusive outreach

### **Representation and role models**

Role models should be attainable, relatable, and varied, so that a range of children (not just girls) can identify with them. Look a bit wider than Marie Curie! With two Nobel Prizes she's a very high standard to live up to. She lived a century ago, and if she's continually the only example girls are given they could get the impression that she's the single exceptional woman who succeeded as a scientist.

Your ‘role models’ may be people delivering or assisting with the activity—undergraduate students can be excellent role models since they're typically not much older than the young people in the audience. Role models could also be the examples of scientists shown in pictures or discussed in your talk or activity. Even if you do not succeed in involving women or members of other minority groups in running your event, a range of different people can be highlighted, be it in pictures or in examples.

### **Choosing your activities**

It's worth familiarizing yourself with, and thinking about, stereotypical things that supposedly interest boys and girls (like football, or fashion) in order to avoid them. Everyone who engages with your activity is an individual, and there's no single thing that is going to appeal (or not appeal) to all girls. This means that by thinking about how to make your activities more inclusive, you can make them more broadly engaging to people of all genders. This could include having a range of ways to deliver information (like a talk and a hands-on activity) or the applications of physics you're discussing (looking at several examples rather than, e.g. all aerospace or all medicine).

If you feel that your existing activities do not work for diverse audiences, it's worth rethinking your outreach concept!

### **Assumptions and exclusion**

If your activity involves students taking on different roles in a team, you could assign these, and ideally ensure the roles rotate. This can avoid girls getting pigeonholed into support roles like note-taking. Similarly, in a talk or workshop, pay attention to giving persons of all genders an equal opportunity to articulate their questions or input. One way of ensuring a balance is to explicitly encourage contributions by members of minorities.

Unintentional exclusion can happen if certain parts of the audience are made to feel like they're not part of the ‘in-group’ by the person in charge. Avoid mocking other branches of science/the humanities or making fun of beliefs, hobbies etc. or blanket statements about what physicists are or aren't like—even if you think it's very obvious that you're joking or you don't really believe what you're saying.

### **Be aware of your language**

Try to avoid unnecessarily gendered language like “spaceman” (astronaut), “manned mission” (crewed mission), or addressing a mixed (or all-female) group as “guys” (everyone, folks, class, people, team...).

You don't need to emphasise to the young people in your audience that there are few women in STEM, that this event is to increase the numbers of girls going into physics, or to put a focus on the problems faced by women in the field. While you should be honest about challenges for women in the field, avoid presenting it as a problem you're expecting these girls to solve.

### **Further reading**

The UK's Institute of Physics has resources around gender inclusive physics teaching for young people, including toolkits, research and an inclusive teaching checklist:

<https://tinyurl.com/iopgender>