

# Explained in 60 Seconds: Astronomy Outreach and Education, Overlap and Differences

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Research institutes publishing press releases about their latest results, scientists sharing their passion for astrophysics on social media, amateurs welcoming the public for a stargazing night, school classes visiting a planetarium or science museum, initiatives training teachers in astronomy or developing classroom resources, colleges and universities offering astronomy courses for majors and non-majors – astronomy education and outreach comprise a broad range of activities. They also frequently go together, with numerous people active in both, but where does one end and the other begin? Let's take a closer look!

## Astronomy Outreach

Astronomy outreach is communication from inside the (amateur or professional) astronomical community to audiences outside of that community, notably to the general public or specific subgroups thereof. Going by the outreach stakeholders we have met and interacted with in the field over the past twenty years, the motivations for doing outreach, which astronomy outreach shares with science outreach in general, include:

1. fostering a society that sees astronomy as a useful and important part of publicly funded activity;
2. attracting bright young adults to scientific careers in astronomy and related subjects, specifically in the case of universities;
3. bolstering the public standing of an (astronomical) institution – whether a scientific institute or an amateur astronomy club;
4. contributing to a science-literate society – more important than ever in the times of Covid-19 and the climate crisis; and
5. in particular, on the part of individual astronomers: sharing their own passion for their subject.

In the first three instances, astronomy outreach is a subset of public relations: institutions communicating in order to influence public perception.

## Informal and Non-formal Education

Whenever astronomers communicate about astronomy in public, they are automatically contributing to informal education: the umbrella

term for any learning that takes place outside a structured learning environment. Non-formal education, in a structured setting such as a youth club, summer camp, or community learning center, also offers opportunities for astronomy outreach.

## Formal Education

Formal education is learning that takes place within the hierarchical education system that runs from primary school through secondary school to university. At the college or university level, astronomers are official actors in their institution's formal education activities. But even at the elementary or secondary-school level, astronomers can contribute to formal education in several ways: organising events that are attended by school classes, or projects in which pupils can participate; producing resources to be used by teachers, or providing teacher training workshops.

Formal education and outreach have fundamentally different goals: those active in formal education are primarily concerned with getting their students to complete, successfully, a predefined course of study. In practice, this means completing a specific curriculum, including required tests and examinations. But curricula frequently do not align with the key content that astronomy outreach is interested in communicating, and for two different reasons: In a number of countries, at least at school level, astronomy is not part of official curricula at all. Where astronomy is part of a curriculum, the focus is frequently on basic phenomena and concepts (e.g., *Office of Astronomy for Education, 2022*), while important parts of astronomy outreach are related to topics of current research at a considerable remove from the basics. Neither discrepancy means that astronomy outreach cannot play an important role in helping to enrich education – astronomy in particular is known to be particularly interesting to students (e.g., *Sjøberg & Schreiner, 2010*), and can thus provide a low-threshold entry into the world of STEM subjects (science, technology, engineering mathematics). But it does mean that people you are in contact with in the formal education sector may approach the matter from a different direction than those active in astronomy outreach – which you should

take into account if you plan to work with them (e.g., *Pompea & Russo, 2021*).

From the perspective of astronomy outreach, investing effort in resources in a formal education setting can be worthwhile in particular because that setting comes with its own effective means of dissemination: produce materials that appeal to school teachers, for instance, and those teachers will then gladly assist you in bringing those materials, and your content, to a wider young audience, namely to their students.

## What Does This Mean in Practise?

In practise, this means there will often be an overlap between astronomy outreach and education. When institutions or individuals think about how best to organise their education and outreach activities, other considerations – which target group the activities are meant to reach, and which formats best suit one's own strengths (e.g., *Christensen, 2010*) – will be much more important than the education-outreach divide, and rightly so. Nonetheless, it pays to keep in mind at least the fact that, when interacting with (formal) educators, their goals, wants, and needs are likely to be somewhat different from yours – and those differences should be respected.

## References

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