

A Planetarium for Astronomy

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Planetariums are continuing to open in Europe and recent years have seen several organizations and meetings devoted to their use. How should a planetarium show be constructed? What are the principles to be followed and the pit-falls to be avoided? This is a problem, because people running planetariums are only rarely astronomers. One great debate centres around the question of whether to use a pre-recorded show or a "live" one.

An automatic show allows a constant level of presentation, however tired or incompetent the lecturer. The Sun rises at the right moment, just as the chosen music starts and either a piece of text or a picture appears. Simultaneous effects can be incorporated, even complicated ones, which often explains a difficult point better.

But it cannot be doubted that the "greatest special effect in a planetarium is the lecturer"! A good planetarium lecturer should simply be a good lecturer, who has a good knowledge of astronomy, who knows how to change their style of presentation according to the audience that is being addressed. A planetarium show should be interactive, the more so, the younger the audience. Questions should arouse interest, and replies should be prepared, which will enable the subjects treated to be understood and memorized. Attention is best captured by direct contact, which is often accompanied by a touch of personal charisma, according to the lecturer's personality.

But such a "dream" lecturer, who has a solid grounding in astronomy is both rare and expensive. Few planetariums are able to obtain one. So I think that the best solution is a pre-recorded programme that incorporates slots for interaction with the audience.

What are the characteristics of a good planetarium show? The aim is to show the universe to members of the general public, without boring them, and without betraying the scientific spirit. A few general principles may be picked out:

1. Always show the sky for that particular season with its essential features: names and properties of the stars and planets, Milky Way, clusters and galaxies visible, etc.
2. Deal with just one theme each time, progressing by stages, using simple and graphic images without being afraid of repetitions. Among the themes to be treated, emphasize "everyday" astronomy (rising and setting of the Sun, seasons, phases of the Moon, red or blue sky, etc.), and topical events (e.g. Comet Halley in 1985–6).
3. Completely avoid mixing inappropriate themes, which causes (or increases) confusion in the minds of the listeners: no parascience, no astrology, no religion. Don't mix "Big Bang" with "Fiat Lux".
4. Avoid reductionism, which over-simplifies discoveries, and tends to lead people

to believe that science in the 20th century can explain everything. After all, we are not yet able to wander around galaxies, and hardly even around the Solar System, contrary to the impression given by some of the media. Only by practising science do we know its limits. An epistemological approach is advisable, enabling one to show the evolution of the sciences over the centuries and the ingenuity of our ancestors, and noting that scientific knowledge is built up layer by layer.

5. Don't emphasize the spectacular aspects to the detriment of the educational ones. Don't attempt to contend with strip-cartoons or science-fiction films, which have no scientific foundation but do have spectacular special effects. In visiting a planetarium, the public is looking for an objective and *faithful* explanation of astronomical knowledge, the "true" universe in contrast to the one shown by astrologers and other charlatans, or by novelists and other audiovisual geniuses. Their work may be very pleasant to read, listen to, or watch, but for them the universe is reduced to a stage set, a falsified backdrop, merely serving to glorify the heroes, the plots, or the stories. In planetariums it is the universe that is the "star", which must not be betrayed with effects that eclipse it (such as laser shows, sound levels that are too high, etc.). Avoid becoming a demagogue (which is not what is wanted) and above all shun any suggestion of "zapping", which is merely superficially, vague, confusing, and counter-productive. Do not use strip-cartoon heroes (Superman or such-like) to get the scientific message across, this only leads to confusion by putting scientific information of the same level as fantasy.

6. Use the planetarium not just as a place of scientific culture, but as one of musical and literary culture also. Express yourself in precise, correct and also elegant language. Don't make any concessions to everyday or slovenly speech; avoid slang. Stud your lecture with quotations from Homer, Bachelard, etc., and with verses from Lamartine, Victor Hugo, Baudelaire, Goethe and others, which will not only enhance the talk but may also help to increase its significance. Use appropriate music and sounds, and silences; draw on the work of Pink Floyd, Grieg, Sibelius, Fauré, Mozart, etc., avoiding too great a dynamic range which will overpower the words.

7. Get to know your public and adapt to it: although scientific knowledge may be objective and universal, the way in which it is spread is rooted in any one culture, and varies according to each country, and each region. Some American planetarium programmes, for example, are studded with local political allusions. Flights of fancy and atmosphere of romance are appreciated by areas of germanic culture.

8. Communicate a taste for astronomy and organize series of talks, training courses, summer schools, etc. for "those who want to know more", places where they can meet and work together.

Such a list of imperatives cannot be followed by all professional astronomers, who are too few, and who, perforce, are not always able to speak at a level suitable for the general public. But if a professional astronomer is also a lover of astronomy then they can validly be involved with a planetarium.

Planetariums are being developed in many countries. Whatever their status and size, active cooperation between those running them and local amateurs is obviously necessary and fruitful for both.