

Communicating Astronomy around the World

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As with any complex topic, communicating astronomy to a diverse audience is a multipart process. One must distil not only the most important pieces of an idea, but also effectively deliver its main points to a novice. Effective astronomy communication is difficult because one never truly knows the reader's limitations. As a result, the best strategies tend to use a series of simple and accumulative analogies and metaphors. The final result, hopefully, is a vivid, clear and concrete image. While effective, this strategy regularly fails among readers from many of the world's cultures.

Communicating Astronomy

Effective astronomy communication requires one to refine the simple from the complex. Distilling core concepts from a sea of com-

plexity is often difficult, as in the case of brain science. Imagine walking into a room full of neuroscientists talking about the inner workings of the brain. The conversation centres on exotic brain modules, strange neuronal systems and obscure Latin terms. Without a training in neuroscience, the discussion sweeps over a world that might as well be fiction. The key in this instance is to translate the technical ideas of neuroscience for a general audience properly. This is an easy process when first learning a complex topic, but increases in difficulty with greater knowledge.

Although astronomy communication is a difficult task in itself, culture adds an additional layer of complexity to an already thorny process. And one of the best ways for understanding these cultural complications is through two different communication strategies — writer responsibility and reader responsibility (Table 1).

Some cultures rely on “writer responsibility”. Writer responsibility is characterised by something called parallel progression, which means that the topic of one sentence overlaps the topic of the next sentence. Parallel progression also means that a reader's failure to understand a passage is usually thought to be the writer's responsibility. Most astronomers who speak English as a native language are accustomed to writer responsibility. And perhaps unsurprisingly, this is also why most popular advocates of astronomy come from writer-responsible cultures.

At the other end of the spectrum is reader responsibility. As the name suggests, when miscommunication arises the responsibility is usually placed on the reader. Reader responsibility is characterised by something called sequential progression. This means that the topic of one sentence is closed and followed by another topic in the next sentence. Many cultures subscribe to reader

responsibility, but Japan is possibly the most important for the field of astronomy.

Writer responsibility and reader responsibility are just two conceptualisations of how culture affects communication. While no culture is purely writer responsible or reader responsible, most lean toward one or other of these two strategies. The best way to see this difference is through an example of how the contrasting strategies affect communicating the cosmos.

The purpose of writer responsibility is to make sure an idea is clear for many different readers. Arguably, it is easier to capture and retain a reader who is constantly aware of the scope and location of a main idea. Because writer responsibility is a highly effective form of communication, it is perhaps unsurprising that most scientific journals, astronomy websites and even podcasts follow writer responsibility.

In contrast, reader responsibility places the onus of communication on the reader. Consider a similar passage on the redshift

separate sentence. As with most forms of reader responsibility, this passage may be expressed symbolically as AB to CD to EF.

The primary purpose of reader responsibility is to convey a message without insulting the reader, if only the right kind of reader. The idea of reaching out to a wide audience is foreign among reader-responsible cultures. And as a result, reader responsibility seeks to please by offering what may seem to be unnecessary details. Stating the obvious is not only perceived as unnecessary, but ridiculous.

Table 1. Primary differences between writer responsibility and reader responsibility.

Writer responsibility	Reader responsibility
Parallel progression AB to BC to CD	Sequential progression AB to CD to EF
Wide audience	Narrow audience

Culture, Communication and the Cosmos

Although intercultural writing is far more complex than the distinction between writer responsibility and reader responsibility, awareness of this basic polarisation is a useful strategy for increasing the effectiveness of astronomy communication. Consider a writer-responsible passage on the redshift phenomenon, which is used for inferring the motion, speed and direction of moving astronomical objects.

The term redshift means that electromagnetic energy in the form of visible light has shifted toward the red end of the spectrum. Objects at the red end of the spectrum are moving away from our point of observation. From our point of observation, many astronomical objects express redshift signatures as a result of our expanding Universe.

The first sentence ends with a comment on light at the red end of the spectrum, which is immediately picked up by the beginning of the second sentence. The second sentence takes the idea of red light and applies it to our point of observation. The third and final sentence continues the process by carrying our point of observation to the expanding Universe. Each sentence overlaps the next sentence. As with most forms of writer responsibility, this passage may be expressed symbolically as AB to BC to CD.

phenomenon from a reader-responsible perspective.

The term redshift means that electromagnetic energy in the form of visible light has shifted toward the red end of the spectrum. Astronomical objects with blueshift signatures are moving toward our point of observation. The galaxy Abell 1835 IR1916 has a redshift signature.

The first sentence begins in precisely the same way as the writer-responsible paragraph. The difference, however, is immediately obvious at the beginning of sentence two. Instead of picking up on the final section of sentence one (redshift), sentence two immediately begins explaining the blueshift phenomenon. Clearly, the red light at the end of sentence one and the blue light at the beginning of sentence two are not the same topic. A similar occurrence is found in the final sentence. Instead of discussing our point of observation in relation to visible light, the final sentence provides an example of a galaxy with redshift properties.

Although all three sentences are related to electromagnetic radiation, visible light and the shifting of objects in relation to that light, they demonstrate three separate topics. Each sentence feeds into a related, but

Summary

Cultures use different strategies for communicating the cosmos. At one end of the spectrum is writer responsibility, which carries the reader through each step of the process. The main strategy for this approach is called parallel progression, in which the topic of one sentence overlaps the topic of the next sentence. The sequential progression of reader responsibility is found on the other end of the spectrum, which demands more of the reader. Instead of overlapping ideas across sentences, reader responsibility covers distinct, but related topics in successive sentences.

Both reader responsibility and writer responsibility are effective forms of communication, but only within a given cultural context. A problem arises, however, when scientists and astronomy enthusiasts communicate with different values and beliefs. This is unfortunate because pondering our place in the cosmos is one of the few areas of universal human enquiry. And this is why culture should never interfere with communicating astronomy around the world.

Biography

Matthew McCool teaches writing at Southern Polytechnic SU (Atlanta GA, USA). He studied intercultural communication at New Mexico SU (USA), literature and philosophy at the University of Illinois at Springfield (USA) and neuroscience at the SIU School of Medicine. He is finishing a book about intercultural writing called *Writing around the World* (Continuum).