Keynote

The Four Functions* of Animation in Science Communication

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Figuring the Invisible

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Abstract
As we know, animation is often used to depict the imperceptible. In astrophysics, for example, scientists have no way of recording dark matter directly, so animation helps to present the current state of knowledge. But the scientific community also sometimes objects to animations that materialize the theoretical in a misleading way. What exactly makes these depictions misleading, however, is difficult to pin down. Indeed, the discussion of animation in science communication can be confusing because it often praises animation's usefulness in one area—such as figuring the invisible—while scolding it for just that function. The discussion points to three other functions that work in the same way: 1) animation's ability to render metaphors easily; 2) its ability to represent change or process by condensing time and space; and 3) its ability to simplify detail and thereby present abstractions that portray the general rather than the particular. Delineating these functions helps us to understand exactly how animation has been historically useful in scientific representation. But the traditional complaints about animation also correspond to these functions. That is, just as these functions outline animation's usefulness, they also indicate the boundaries of appropriate use. Each of these functions comes with caveats, or implicit asterisks, that keep animation in its proper role in science communication. Making these hidden stipulations explicit is an important goal for the history of animation in science. Focusing on a scientific advisory board's objections to the use of animation in the Bell System Science Series (1956-1962), this presentation will describe the four functions (and their asterisks) in an effort to clarify when animation has been applauded—and precisely why it has been booed.

Bio
Scott Curtis is Associate Professor in the Department of Radio/Television/Film at Northwestern University in Illinois, USA and in the Communication Program at Northwestern University in Qatar. He has published extensively on the scientific and medical uses of moving-image technology; his work has appeared in such journals as *Science in Context*, *History of the Human Sciences*, and *The British Journal for the History of Science* as well as *Film History*, *JCMS: Journal of Cinema and Media Studies*, and *montage/av: Zeitschrift für Theorie & Geschichte audiovisueller Kommunikation*. He is the author of *The Shape of Spectatorship: Art, Science, and Early Cinema in Germany* (Columbia University Press, 2015), which explores the collision between moving images and expert modes of viewing in science, medicine, education, and aesthetics. He is also the editor of *Animation* (Rutgers University Press, 2019), which surveys the history of American animation through the lens of its changing modes of production. His current project, *Theory in Motion: Animation and the Scientific Imagination*, combines these interests by investigating the uses of animation in scientific research, training, and outreach.