Observing the Minuscule

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Microscopes are common instruments in high school science labs today, but they were not always universally accepted. When innovators such as Anton van Leeuwenhoek, Marcello Malpighi, and Robert Hooke initially developed the microscope in the 16th and 17th centuries, the instrument raised more questions than it provided answers. Unlike telescopes, which quickly gained acceptance in the well-established field of astronomy, microscopes depicted a realm of the small that was utterly unfamiliar. Without a framework for understanding these images, how could observers trust that what they saw was a faithful depiction of the natural world?

Today, microscopes continue to push our limits of understanding. Electron microscopes, for example, offer imaging at the atomic level, which is even smaller than the visible spectrum our eyes can perceive. What exactly are the limits of these images, and how do we know we are viewing a true representation of the world of the minuscule?