

Gestalt Switch in Molecular Image Perception: The Aesthetic Origin of Molecular Nanotechnology in Supramolecular Chemistry

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Abstract

According to 'standard histories' of nanotechnology, the colorful pictures of atoms produced by scanning probe microscopists since the 1980s essentially inspired visions of molecular nanotechnology. In this paper, I provide an entirely different account that, nonetheless, refers to aesthetic inspiration. First, I argue that the basic idea of molecular nanotechnology, i.e. producing molecular devices, has been the goal of supramolecular chemistry that emerged earlier, without being called nanotechnology. Secondly, I argue that in supramolecular chemistry the production of molecular devices was inspired by an aesthetic phenomenon of gestalt switch, by certain images that referred to both molecules and ordinary objects, and thus symbolically bridged the two worlds. This opened up a new way of perceiving and drawing molecular images and new approaches to chemical synthesis. Employing Umberto Eco's semiotic theory of aesthetics, I analyze the gestalt switch and the inspiration to build molecular devices and to develop a new sign language for supramolecular chemistry. More generally, I argue that aesthetic phenomena can play an important role in directing scientific research and that aesthetic theories can help understand such dynamics, such that they need to be considered in philosophy of science.

Keywords: Aesthetics of science, molecular representations, supramolecular chemistry, nanotechnology

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