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Scientist David Stork defended Renaissance painters against claims they used optical devices, such as convex mirrors, to construct their revered artwork.

Scientist rebukes theory of optics use in Renaissance art

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The masters of Renaissance art did not "cheat" by using optical devices like convex mirrors hundreds of years ago, Ricoh Innovations chief scientist David Stork said at Boston University's cognitive and neural systems department building Friday afternoon.

Stork defended Renaissance painters like Giotto di Bondone and Jan van Eyck, countering allegations that artists "cheated" with optics to create realistic works, to 20 community members at the final chapter of BU's Colloquium and Science of Learning Seminar.

"Before 1430, paintings looked awkward and almost cartoonish," Stork said, using an example of Florentine painter Giotto di Bondone. "The theory is this: Renaissance painters used mirrors and lenses in their work [to improve realism]."

Much of Stork's research focuses on computer analysis of art. His work has lent a scientific perspective to counter the guesswork of optical-painting theories popularized by British pop artist David Hockney, who claimed Renaissance artists used an optical device to project images on a wall before tracing them.

Proponents of the optical-painting theory point to Jan van Eyck's Portrait of Giovanni Arnolfini and his Wife.

In the background of the painting, a convex mirror reflects the backs of Arnolfini, his wife and even the spectators of the room upon closer inspection. Some critics have interpreted the mirror as a hinting reference to the use of convex mirrors, which artists were otherwise "astoundingly secretive about," Stork said. Although exceedingly difficult to paint and impressive for the mid-1400s in terms of detail, Stork argued the painting was not the product of an optical device.

A chandelier in the painting, perceived by Hockney as "in perfect perspective," was proved not to be as accurate as the author claims under the critical eye of computer analysis.

"There is asymmetry in the chandelier, but how symmetrical were the chandeliers of the time?" Stork asked. "Almost close to perfect. Chandelier arms were made from the same mold. It's quite clear he didn't use optics."

Other works by van Eyck have two versions with the same proportions but different sizes, like Portrait of Cardinal Niccol�? Albergati. There was much debate over van Eyck's method until an analysis "found little pinpricks" in one version, Stork said. He had used a simple device called a "proportionalszirkel," similar to a compass with an off-center attachment, to make the correct proportions.

Stork continued with other early realists, including Lorenzo Lotto and his work Husband and Wife. Although his paintings appear symmetrical, especially his complex carpet patterns, "every one of them is highly asymmetric," Stork said.

Besides, Story argued, optic-painting theorists ignore a key aspect of realism: color.

"Realism is due to contour and color," Stork said. "Projection does not even replicate color entirely. All the painter would have is a paint-by-numbers pattern."

Optics also cannot account for objects in motion, non-existent objects, self-portraits or murals, Stork said.

He suggest that the popularization of oil paint, which "allows for a wider range of saturation, glazing techniques and dries more slowly than other paints," might be responsible for the change in realism around 1420 from the cartoonish to the realistic.

Around the time of the Renaissance, there was also a greater knowledge of anatomy and geometrical perspective, Stork said. And even simpler, people started to wear glasses.

"This is exactly the time when spectacles were cheaper and more ubiquitous," he said. "Did the old masters cheat? Probably not."

Graduate School of Arts and Sciences student Vitaly Ablavsky said he was not surprised at the surmounting evidence against optics use in realist painting.

"There are basically two reasons why this is plausible," he said. "For some, it's not that hard to draw well, and that's not what art is about anyways."

The computer analysis also "brought together art and science in a meaningful way," Ablavsky said.

Event faculty host Gail Carpenter said Stork's analysis brought a better picture of Renaissance art techniques.

"David brings a more scientific and qualitative answer" to the question of optic devices in art, the cognitive and neural systems professor said.
