

“Seeing is Believing: Experiment I”

Jayanne English (University of Manitoba)

Brad Miller (University of New South Wales)

The International Year of Astronomy 2009 provides the opportunity for astronomers, both professional and amateur, to share their enthusiasm for exploring the heavens with the general public. Since visually striking images are especially successful in piquing the public’s interest, research astronomer Jayanne English (University of Manitoba) instigated the formation of a Canadian database of astronomical images (<http://www.galaxydynamics.org/iya2009/>) for this event. The images have been displayed as photographs at the Ontario Science Centre and during Toronto’s Contact photography festival. In such situations the images provoke questions of representation and authenticity. Are the images snapshots documenting physical reality? Or are they artistic spacescapes created by digitally manipulating astronomical data?

English and her collaborator, new media artist Brad Miller (COFA, University of New South Wales), extend these inquiries by using images from this database in on-going interactive projects that incorporate the viewer’s motion, turning people’s interactions with representations of stars, planets, nebulae, and galaxies into an analogy for scientific exploration. The first piece which is accessible online at <http://sites.cofa.unsw.edu.au/~z9270907/seeingrotations.html> responds to the motion of the viewer’s mouse, causing images to slide past each other to create poetic visual associations. In this way “Seeing is Believing: Experiment I” ironically plays with the human visual perception system as a metaphor for the challenges associated with acquiring and interpreting astronomical observations. For example, the graphical context of each of the images uses subtle optical illusions to highlight that the observation of astronomical phenomena, and the acquisition of scientific data in general, is affected by human physiology. This aspect of the piece is motivated by Lakoff and Johnson’s reflections on the impact of Cognitive Science and linguistics in *Philosophy in the Flesh* (1999). That is, it acknowledges that any visual apprehension of information is embodied, rather than purely intellectual, since its acquisition is convolved with the eye-brain system.

Individual images in this piece are initially organized into groups according to Cognitive Science’s understanding of how humans

categorize; this approach presents Lakoff and Johnson's argument that classification is fundamental to thought. The viewer can attempt to recover these groupings by using the mouse to change the speed with which the images traverse the monitor. Just as with the interpretation of scientific experiments, it is challenging in "Seeing is Believing: Experiment 1" to discern the meaningful, or fruitful, connections from numerous pleasant, but irrelevant associations. The role of the viewer's interaction with motion is to highlight the individual's role in the interpretation of data and establishment of scientific discoveries. For example, some viewers may select a slow speed in order to examine one astronomical object in particular, avoiding categorization. Others may select a fast speed, becoming awash in a flow of information without structure. Still others may explore various speeds, spending time constructing numerous perspectives from this subset of the astronomical database.

In all cases, the viewer will find the piece difficult to control, which could lead to feelings such as frustration or the elation associated with a challenge. These feelings emotionally and metaphorically correspond to the experience of acquiring scientific data and interpreting results. However they are also experienced when endeavouring to construct visual art pieces. As well presenting "Seeing is Believing" as a metaphor for scientific activity, the software will provide each viewer with the opportunity to produce their own artistic oeuvre, moment by moment, as their motion causes a set of images to be framed within the stage of the monitor. In any particular time interval it is hoped that observers will read the relationships that they create (between empty space, the emptiness of outer space, patterns of images, portrayed physical structures, and the various colourful elements of the piece) in a lyrical mode conducive to the embodiment of their own thoughts.

While we will retain these aspects in future Seeing is Believing experiments, our proposed full scale installation rendition of the work will extend the viewer's experience beyond the motion of the mouse to the use of the whole of their body. The metaphors we hope to explore will arise from an algorithm translating the proximity of the viewer to the images into the relationship between proximity and motion in cosmological terms. The challenge will now be to navigate a room, a full 3D space, in order to discover and classify the ephemeral astronomical content. The possibility of multiple, simultaneous viewers moving within the installation will provide an additional, important complexity. Rather than the path of one viewer, the movement through the space will be representative of a flock. How will this change the metaphors and

narratives generated by viewers in the Seeing is Believing universe?

The astronomy images used in "Seeing is Believing: Experiment 1" were selected from the Canadian International Year of Astronomy Image Database at <http://www.galaxydynamics.org/iya2009/>

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The Great Collision Simulation: John Dubinski (U of Toronto)

The Whirlpool Galaxy: Remi Lacasse (astromirabilis)

Nebulae:

Collage of Supernova Remnant and VLA Telescope: Michael Bietenholz (York University)

The Cygnus Region of the Milky Way in Invisible Light: Jayanne English (University of Manitoba) with support by A R Taylor (University of Calgary) for the Canadian Galactic Plane Survey

The Heart of the Crab Nebula: Jayanne English (University of Manitoba) and the Hubble Heritage Team, NASA

Nebula van den Bergh 152: Paul Mortfield (Industrial Stars) and Stefano Cancelli

Planets:

Jupiter and Io: Andre Montambault

Star and planet candidate: David Lafreniere, Ray Jayawardhana, Marten H. van Kerkwijk (University of Toronto and Gemini Observatory)

Comet Holmes: Pierre Tremblay (Quebec City)

Stars:

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Sun:

Our Star: Rick Stankiewicz (Peterborough, Ontario)

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