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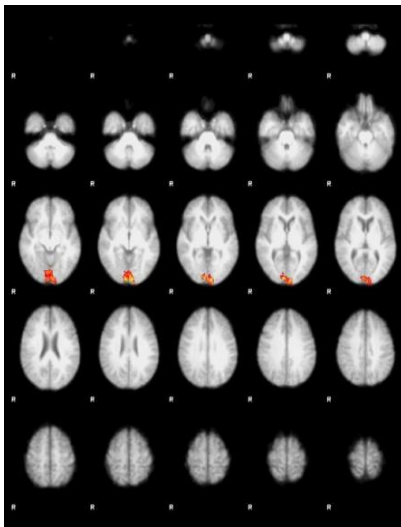


Sutter Imaging Center
California, USA

fMRI Study Finds Unique Neural Correlates in *Open Sky Compositions™* Designed to Enhance Patient Experience

April 10, 2014 –Texas Tech University’s Neuroimaging Institute’s study, *Neural Correlates of Nature Stimuli: An fMRI Study*, published in the Winter 2014 issue of the peer reviewed *Health Environments Research & Design Journal (HERD)* uncovered the neural pathways involved in the perception of open sky photography used in the creation of biophilic

illusions of nature. Virtual skylights designed as *illusions of nature™* are used by leading hospitals worldwide in diagnostic and therapeutic radiology suites to mitigate stress and anxiety, enhancing the patient experience by enlivening our innate connection to nature - *biophilia*.



Unique brain activations of the cerebellum were effects of subjects viewing Sky Factory photographic sky compositions.

The study examined whether there are unique patterns of brain activation associated with exposure to photographic sky compositions (representing nature stimuli) as compared with other positive, negative, and neutral images. The positive impact of nature images on health outcomes traditionally has been measured using behavioral and physiological indicators. However, there is a lack of understanding of the underlying neural mechanism that explains the positive influence.

Image courtesy Texas Tech Neuroimaging Institute.

The study generated brain maps of the neural

pathways and regions associated with subjects' perception of Sky Factory *Open Sky Compositions™*' unique imagery and compared those results with the mapped responses of the subjects viewing imagery established as being positive, negative or neutral.

"These studies deal with the ground-breaking application of fMRI technology in building justifications for actual commercial products in a real-life context," said Dr. Debajyoti Pati, Rockwell Endowment Professor at the Department of Design and head of the research team at Texas Tech University.



Sky Factory's unique photographic sky compositions are designed to deepen biophilic engagement.

extended space, as well as imagined, or real, motion through that space," said neuroscientist Dr. Michael O'Boyle. "By way of speculation, it may be that viewing Sky Factory compositions evokes a sense of expansion into or through this extended space," he remarked.

The research project is spearheaded by College of Human Sciences' researchers Drs. Debajyoti Pati, Michael O'Boyle and Cherif Amor, who investigated the effects of Sky Factory's photographic sky compositions on brain activation in the first study, and will study the effects of the Sky Factory's virtual skylights on hospital patients in a second project.

Several decades of evidence-based design research indicates access to nature or nature imagery supports healing, reduces stress and anxiety, and reduces the use of pain medications in healthcare settings. *Illusions of nature™* manufactured by The Sky Factory – notably their Luminous SkyCeilings™ – have been installed in healthcare environments around the world to alleviate stress, promote patient relaxation, provide positive distraction and improve the patient experience.

Initial analysis of the brain maps indicates that the photographic sky compositions shared all of the characteristic neural activations of other positive images, while, additionally, activating several other unique brain regions. Of particular interest to the researchers were the activations found in the cerebellum.

"Brain activation of the cerebellum is often associated with aspects of spatial cognition, in particular the experience of

Dr. Debajyoti Pati said that, “The best expectation out of a relaxation-inducing positive distraction feature is diversion of one’s attention and consciousness from the immediate ailment and stressful environment. Neural activations in response to the visual stimulus used in this study suggest that cognitive diversions induced by photographic sky compositions may result in significantly different and higher levels of positive physiological responses as compared to positive images in general.”

“Sky Factory’s founder, Bill Witherspoon, said, “Of particular interest to us is that this research confirms our success in introducing compositional principles and elements into sky images that create the visual cues necessary to trigger a profound ‘relaxation response’ – the unique physiological state that corresponds to an expanded awareness and sense of inner peace and stability.

“This compositional artistry explains to us, at least in part, why Sky Factory sky compositions activate areas of the brain not activated by other positive nature images.

“We expect that additional research is likely to further link this experience of SkyCeilings to the biophilic engagement that is reported by end-users,” Witherspoon concluded.

About The Sky Factory

The Sky Factory, LC is a unique fine art and technology company based in Fairfield, Iowa, USA. Founded in 2002, the company creates realistic *Illusions of Nature*[™] - virtual skylights and windows - that transform interior spaces. Applications include hospitals, senior care facilities, schools, workplaces, hotels, spas, and luxury homes. Sky Factory’s new digital cinema product line features *UltraHD* motion and sound displayed on commercial-grade LED monitors. For more information and a complete list of International Partners, visit www.SkyFactory.com.

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