

Stereo Animated Pictorial Space: Le Phénomène Atmosphérique

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How can artists influence new technological initiatives and push the expressive capabilities of animation and 3D stereoscopy towards a new pictorial space? How can we create fully immersive paintings where large scale moving paint marks and textures would appear to exist in real space? Written at the starting point of this research, this paper will try to describe it, with emphasis on the first art works produced.

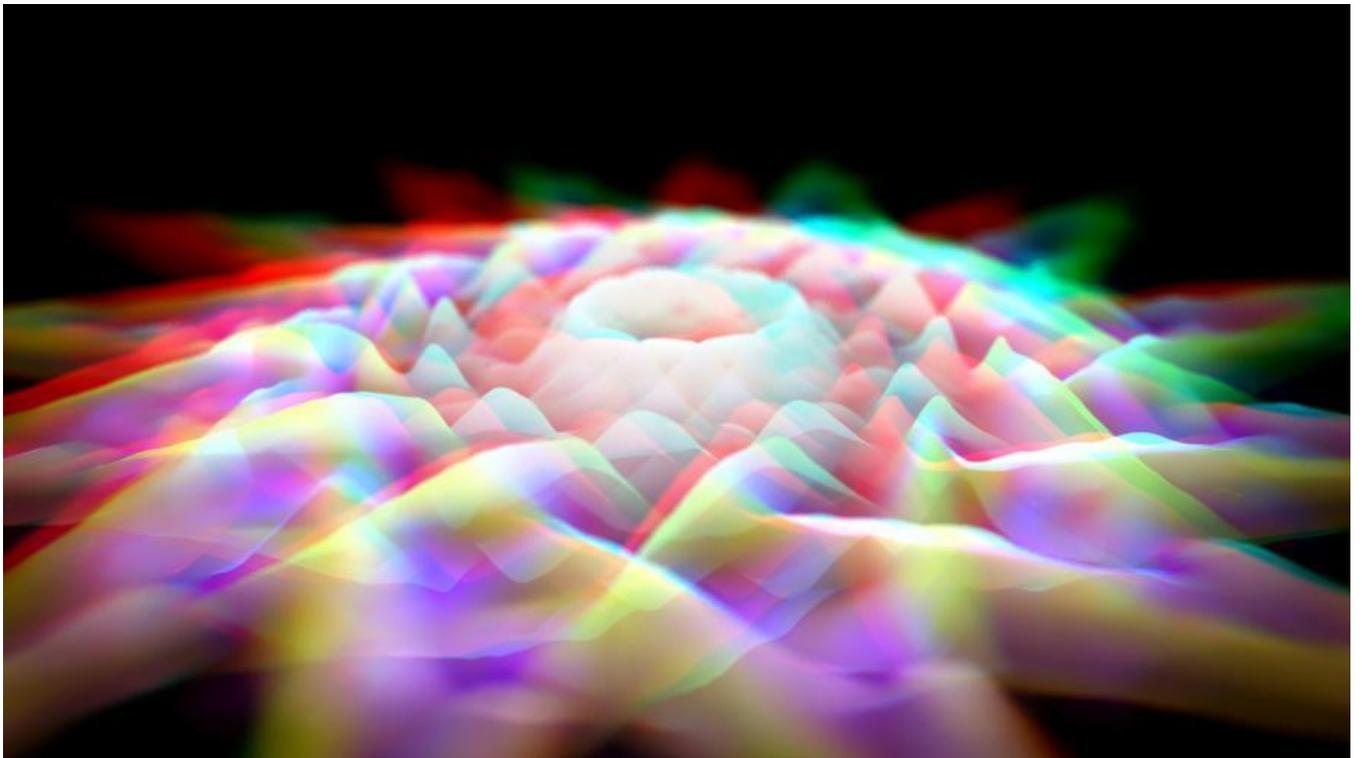


Fig.1. Le Phénomène Atmosphérique: Aurora, 2011, Ina Conradi and Yoon Wan Cheong Davier, Still from 3D stereo Digital Animation, © 2011 Ina Conradi. 3D red-cyan glasses are recommended to view this image correctly.



Fig.2 Le Phénomène Atmosphérique: Glories, 2011, by Ina Conradi and Yoon Wan Cheong Davier Still from 3D stereo Digital Animation, © 2011 Ina Conradi. 3Dred-cyan glasses are recommended to view this image correctly.

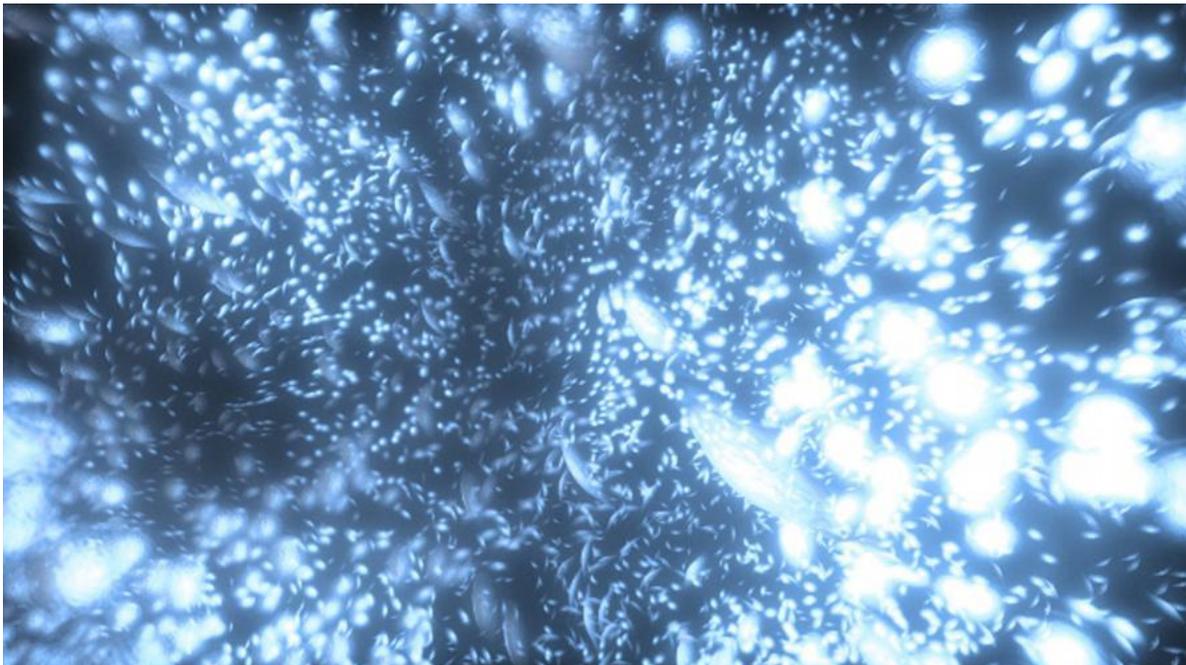


Fig.3. Le Phénomène Atmosphérique: Precipitation, 2011, by Ina Conradi and Yoon Wai Cheong Davier, Still from 3D stereo digital animation, © 2011 Ina Conradi.

Introduction

Recently started research within the Institute of Media Innovation, and continued as part of the Academic Research Fund (AcRF) TIER 1, at the School of Art, Design and Media, at the Nanyang Technological University, opened an original field of explorations into inventive applications of 3D stereoscopy and artistic digital media expression. This writing occupies a potentially contradictory place in relation to the actual art piece, an animated film *Le Phénomène Atmosphérique*, which will accompany the presentation of this paper at ISEA 2011 Istanbul.

In *Le Phénomène Atmosphérique*, the argument of the research project will be made visually. This experimental 3D stereo animated amalgam, with heightened senses of emotion and immersion, aims to create a pictorial experience that is dimensionally composed in virtual and real space. Sixteen short sequences of painted and animated atmospheric optical phenomena will be juxtaposed without a great deal of verbal explanation. However, here they appear as a reproduction, flat and printed as anaglyph composites. The print visual results in poor color fidelity as it is viewed with passive red/cyan glasses, but when experienced in person as a fusion of visuals, sound and movement, it is meant to reveal a quite different feeling. Moreover, a text will try to articulate the notion of painting as one that is based precisely on its resistance to language, and is fueled by the immediacy of a sensory enhanced illusion of depth; and therefore is expanding its pictorial space. The sole write up on stereo design methodology carries a risk of standing in opposition to the actual viewing experience. My feeling, however, is that, during the visual presentation, the two will stand as balanced complements. At the same time both the art works and the write up actively embrace the contradiction. On one side, there is the frustration to clearly define painting, and how it relates to the prolific chaos of popular digital image making methodologies; in particular, visual effects in cinema. On the other, continuing pleasure in painting and being so completely motivated by pictorial qualities, makes these works very close to the spirit and intention of twentieth century abstract painting practice. As American abstract painter, Ad Reinhardt put it: "If I were to say that I am making the last paintings, I do not mean that painting is dying. You go back to the beginning all the time anyway." [1]

'Cyclops Eye'

Roger Ferrgallo points to Charles Wheatstone's 1838 discovery of the psycho-optical consequences of our binocular vision of reality – where one sees that this reality is the product of our two spaced-out eyes, rendering two different retinal views of forms in the visual field, so called stereopsis – as a discovery that caused great excitement in the arts. To quote Ferrgallo's enthusiasm from his *Manifesto*:

Painting is reborn. Enter the new awareness of stereo space and a new aesthetics in painting. The century's long conquest of plastic forms within a monoscopic pictorial space may be at the end. A new powerful illusion of the three-dimensional space-field is possible. It asks nothing more than the trance-like stare of the middle eye to waken *Cyclops* from his 35,000-year sleep. This primeval giant's reward will be the sudden revelation and witness to the dematerialization of the picture surface into an aesthetics of pure space where visible forms will materialize and release themselves—forms that are suspended, floating, hovering, poised, driving backward and forward, near enough to touch and far enough away to escape into the void. So now, enter a new aesthetic empathy, meditation, subjective intensity and an unparalleled form-space generation and communication. All of this exciting injunction could have been declared 134 years ago had it not been for the invention of photography. However, at that time, 1838,

the full investigation of form within the limits of the monoscopic surface had not yet been fully realized: the genius of Cezanne, Picasso, Braque, Duchamp, Balla, Mondrian, Kandinsky, Moholy-Nagy, Pollock, and Escher lay ahead. Awaiting the future, too, would be the subjection of the picture plane to the forces of sculpture. [2]

To what extent did the recent surge in 3D, stereo media inspire the desire to alter the viewer's experience of the painted surface? It was left to the advancements in visual effects and image manipulation to influence artists to definitively break with easel painting and to account finally and determinedly for the emergent binocular vision of 20th century abstraction. [3] The influence of cinema alone with the surprise and marvel at the magical trick of 3D stereo illusion is addictive, as the spectator wants to immerse oneself in the 'optical fantasies.' Paradoxically, when used in arts, 3D stereo technology generates complaints. [4] The inevitable threat of danger continues in crossing the boundaries between popular media and traditional painting media. Consequently, in the 21st century painting practice continues dancing in circles with technology, while the physical materiality of the still, flat canvas, and the magic of projected animated visuals are chasing each other's tail. [3] Anne McCauley, in her essay on *Realism and its De-tractors*, states:

The undeniable commercial success of stereoscopic views was met by charges that the stereo images appealed to the young and ignorant, enticed the masses with the objects beyond their means, undermined the taste for the ideal, and encouraged idleness. The contemplation of images, particularly those that seem to dissolve their mode of creation into the transparency of nature when it is confronted directly, has always been fraught with danger: the danger of confounding the icon with its unknowable referent, the danger of desiring things of the world, the danger of being fooled into thinking that the illusory is real. Yet, at the same time, the production of images that go further and further in recreating the effects of lived experience reveals how widespread is the public's willingness to succumb to phantoms, dreams, *simulacra*, where the body vaporizes into pure visuality and effortlessly travels in space and time. Nowhere can this conflict between the popular craving for visual thrills and the condemnation of such desires be better observed than in responses to stereographic arts – photography and moving image. [4]

McCauley illustrated popular beliefs that 3D stereo invention carried apocalyptic predictions of 'the end of creativity' for the traditional fine arts. Today, however, all practices can benefit from each other. The 'chaos of connections' in new media, science, and traditional painterly approaches could be used to gain advantages towards helping painting to expand into new space. [5]

Rebuilding Abstraction

Abstraction in painting is putting too much emphasis on the materiality of pigments and immediate random gestures. In fear of any figuration and illusionism, pictorial space is being reduced to a thin, shallow, and inert one; threatening to disappear all together. In addition, regardless of if it is figurative or non-figurative, the appearance of things in paintings has very little to do with the way one actually sees things and how they are represented on the surface. Moreover, it is nearly impossible to attempt to make things look in painting the way they look when one perceives or experiences them. 3D stereo space is a fragile illusion, however it is able to restore pictorial space, by converging not only the renaissance notion of measurable space, but also of the void and pure spaces of Malevich's white square; and of Irwin's experiences of the fourth dimension. There is a thrill to be given such an exciting opportunity to explore how stereo immersion can keep the concept of painting fresh. In fine arts, human perception plays a central role in establishing a channel between the artist and his audience over which emotions,

feelings and ideas may be communicated. Our intellectual experience complements spatially and formally, the optical phenomenon perceived by the eye and renders them into a comprehensible whole, while photographic cameras reproduces the purely optical picture.

In painting, some of the monocular depth cues (light and shade, relative size, interposition, textural gradient, aerial perspective, motion parallax, linear perspective) have been vastly exploited and exaggerated to compensate for the absence of binocular depth cues (binocular disparity and convergence). [6] Binocular depth cues are provided by the two retinal images perceived by our left and right eyes. In the presence of binocular depth cues, the human visual system is able to evaluate and appreciate depth information. [7]

When stereo pairs of images are created and presented to each eye, care must be taken to properly reproduce these cues; otherwise, the viewer will experience discomfort. The challenge is in creating the 'miracle balance' with proper use of interaxial separation. Interaxial separation and zero parallax settings are key to getting the desired stereo effect. Setting the right values is crucial as it could result in a good stereoscopy with convincing spatial depth or one that is painful to watch. Interaxial separation determines the distance between two cameras; in real world scale, it would be set to a value of 6.0 to 6.5 cm (2.4" to 2.6"), to simulate the average distance between the human eyes. In these experimental works, which do not simulate in a representational and realistic manner, the right value had to be generated via trial and error by preview. In this project, the preview was done using 3D 120Hz LCD technology with active shutter glasses, where composites of the left and right eye images are presented on alternating frames. Each eye is still seeing a full 60Hz signal equivalent to the refresh rate on the LCD monitor. From tests, it is apparent that the Interaxial Separation value is inversely proportional to the apparent size of the 3D object. A large value would make the object appear bigger and closer, while a smaller value would make the object appear smaller and farther.

Painting as emerging and expanding space

Le Phénomène Atmosphérique, is a 3D stereo animated film inspired by the works of Olafur Eliasson and his on-site constructions of nature, as well as the Light and Space Movement associated with figures such as Robert Irwin and James Turrell; and their works in Southern California during the 1960s and 1970s. *Le Phénomène Atmosphérique*, is not an homage to these works but rather an attempt to continue to elaborate on the possible role of heightened spatial displacement; and how we experience depth, space and color. It is continuing justification that any new and worthwhile development in painting must be founded by extending the 'working space' of painting into virtual space. In this case, the painting space is the one that will be integrating Stereo/3D animation and projection, motion and sound. The main motivation behind the featured artwork is to break away from two-dimensional easel painting and towards 'freedom of materiality' and 'pictorial expansiveness.' [3] The film made use of the Next Limit Technologies, Real Flow and Real Wave software, which create unique fluids and physical body dynamics for realistic water simulations in visual effects industries. The scenes were composed in 3D stereo to create a general feeling of atmospheric optical phenomena and weather formations such as airglow, aurora, clouds, precipitation, rain, and windstorm. To highlight the distinctive beauty and unpredictability when water and light work together, various caustics were generated. Almost every shot in this film has been derived directly or indirectly from a caustic image sequence. The visual effect is seen when light is reflected off a specular or reflective surface, or focused through a refractive surface, so that it indirectly illuminates other surfaces with focused light patterns. In 3D graphics, caustics are rendered as a type of global illumination, using raytracing techniques. The notion that we 'see' the precipitation, as a quietly turbulent atmospheric water phenomena, sometimes on the screen surface and

sometimes floating in front of it, leaves the space and voids surrounding the water vapor with an ambiguous but strangely compelling set of coordinates. The 3D volume illusion is only serving as an armature to support the image's crumbling materiality. What is learned in this film is that relying on 3D stereo alone to create new perceptual experience is not enough. Energy of created 3D volume and mass has to be accompanied with the proper handling of stereo composition, color, light, and rhythm. They are the main anchors for the lightweight atmosphere of shallow moving surfaces.

Utopians of the image

The suggestive phrase 'utopians of the image,' is used by Ray Zone, in his article on 3D stereography. He said that the discovery of stereography preceded the invention of photography as well as motion pictures:

In fact, the realism of the very first stereo view cards drove the invention of motion pictures. These inventors looked through the stereoscopes and saw a 3D image, and asked themselves, 'What's missing?' Well, motion was missing, so as utopians of the image, they set out to add not just motion, but sound, and color, and depth.[8]

The artist painters and filmmakers are continuing to create experiences that are not simply mimicking reality. In fact, they are embracing the ways that works of art are different from reality. [9] In today's hybrid mixed media artworks, depth is still a very powerful perception tool. To arrive at "the painting which shall not be distinguished in the mind from the object itself," [10] is becoming easier with the improvement in 3D stereo, where forms can be made to exist synthetically in a binocular space; a field that is itself consonant with reality. For this research, the focus will remain on providing a means for resurgence in dynamic painting practices through beauty, vision and sensibility of innovative stereo animated content, but at the same time initiate a potential of new developments in 3D stereo technologies. Drawing on the ideas of recent technological initiatives in S3D technologies and the renaissance in stereoscopic cinema, this project is an exciting opportunity to continue to explore the innovative convergence of art and technology.

References and Notes:

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