

## Menu

- [Home](#)
- [About](#)
- [Editorial Board](#)
- [Submissions](#)
- [State of Play](#)
- [Contact](#)
- [Past Issues](#)
- [» Latest Volume](#)

## ANIMATING EPHEMERAL SURFACES: TRANSPARENCY, TRANSLUCENCY AND DISNEY'S WORLD OF COLOR - KIRSTEN MOANA THOMPSON

AUGUST 6, 2014 BY ANGELAN



**Abstract:** *This paper examines the unusual theatrical and exhibition dimensions of Disney's World of Color, an outdoor night time entertainment spectacle which screens animated films on ephemeral materials: the water spray and light produced by fountains, water, mist and fire. It considers how this show innovates a new form of theatrical exhibition, combining older art forms from fireworks to pyrodramas, with contemporary computer-controlled light and colour design and immersive effects. It will suggest structural and aesthetic connections between this animated attraction and recent technological innovations such as Google Glass™ in which mobile computer interfaces combine transparency and opacity as an essential part of their formal structure and tactile pleasure. Theorising that the relationship between animation and the ephemeral is also situated in these tensions between the transparent and opaque, I go on to suggest that Disney's World of Color is a particular instantiation of the ways in which "animation" can be understood not only as a specific technical process, but also as a form of corporeal transformation in which movement, light and colour enlivens individual bodies and screen spaces.*

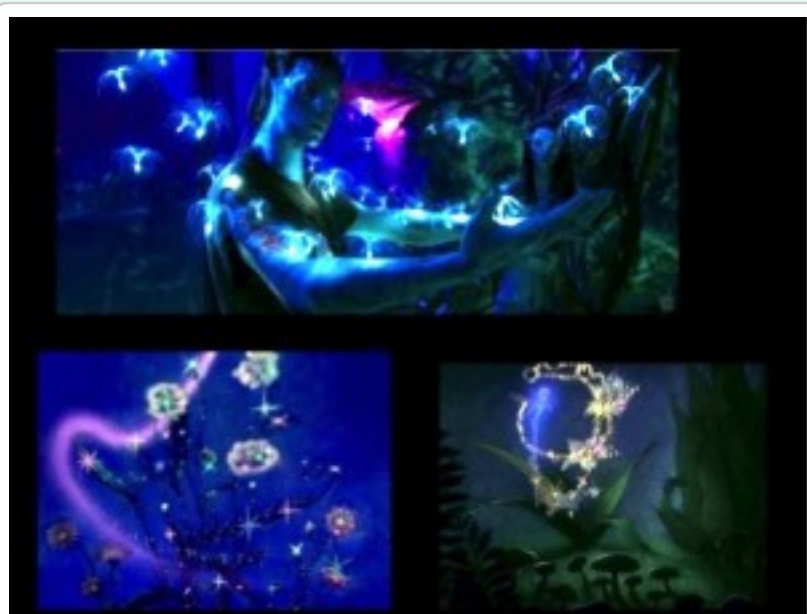


Figure 1. Top Image, frame grab from *Tree of Souls* sequence in *Avatar*. Dir. James Cameron, 2009. ©20th Century Fox, and bottom images, frame grabs from *Dewdrops Fairies*, in *Dance of the Sugar Plum Fairies*, *Nutcracker Suite* sequence, *Fantasia*. Dir. Wilfred Jackson, 1940. ©Walt Disney Productions.

Disney's *World of Color* is a night time entertainment spectacle combining water, fire, projected light and colour that takes up the delicate play of the transitory, foregrounding the material and aesthetic relationship of transparency and opacity. From fireworks to hydraulically engineered musical fountains and pyrodramas, the show's innovations in theatrical exhibition hybridise older entertainment forms with digital-controlled light and colour design and immersive effects, blending tourism, the amusement park and cinematic projection. *World of Color's* ephemeral media literally materialise the affective fuzziness and softness of our nostalgic memories and desire for that which is past and lost—Disney films, our own childhood—promising, if only for the duration of the show, that

these desires can be momentarily recaptured and relived. Theorising that the relationship between animation and the ephemeral is connected to the tensions between the transparent and opaque in classical cel animation, together with their persistence in new media forms like digital animation or Google Glass, this paper suggests we must expand our understanding of what it means to animate our real and virtual environments today.

### PAGES

- [About](#)
- [Contact](#)
- [Editorial Board](#)
- [Home](#)
- [Past Issues](#)
- [» Latest Volume](#)
- [State of Play](#)
- [Submissions](#)

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[Volume 24, 2014](#)

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In classical cel animation the dialectical relationship between translucency, transparency and opacity was key. Cel animation's production was inherently palimpsestic, depending on light to shine through layers of transparent nitrate or acetate cels, made partially opaque with painted characters, props or backgrounds, all of which were layered together to create the illusion of depth. The use of cels was part of the Taylorisation of the industry in the twenties to minimise time in a labour-intensive production process. Light joined with glass when individual cels were photographed sequentially frame-by-frame under transparent sheets of glass that were clamped down to keep dust from the cel. The greater the layers of cels, the less light penetrated through to the deepest layer and the more blurry was the resultant composite image, with generally five cels as the maximum number of layers possible (Furniss 2007, 74). In the contemporary era this problem has been obviated by digital compositing's capacity for greater integration of planar layers of data, without loss of sharpness or light. If the clarity or translucency of the image in cel animation was shaped by its palimpsestic structure, the choice of different materials from pastels to watercolours, oils or pencils also mediated the degree to which light passed through the cels.

A translucent object allows light to pass through it, but depending on its materials, diffuses or scatters that light, whereas a transparent object allows the direct transmission of light without scattering or diffusion. Glass and clean water are optically transparent media through which most of the light passes directly. By contrast, our own bodies are translucent, and depending on pigment and the right light conditions, we can see the bones through our skin. Light permeates our bodies and enters our brain cells where it is converted from light waves into electrical charges by the optic nerve. On the level of perception, our bodies literally mediate light, to which "our eyes are drawn ... which impels the reflex adjustments of our irises" (Powell 2007, 87). In other words, just like the transmission of light, the *perception* of light is always materially embodied through relations of penetration, mediation and transformation.

Not only is the dialectical relationship between opacity and transparency, or more accurately, the translucent, crucial at a material level in animation, it is also frequently present at the level of representation to spotlight luminosity, colour and delicacy of design, showing the oscillating starburst at the arrival of the blue fairy in *Pinocchio* (Ben Sharpsteen and Hamilton Luske, 1940) or the airbrushed translucency of her shimmering blue gown. From the gleam of a Grinch's heart as it grew "three sizes bigger" in *How the Grinch Stole Christmas* (Chuck Jones, 1966) to the effect of the Blue Fairy's wand as she changes Pinocchio from a wooden puppet into a boy, twinkling stars, sparkles, fairy dust and other scintillating or radiating gradients of luminosity are traditional signifiers of transformation effected by alternating opaque or transparent cels with translucent overlays of luminous objects like painted stars. More than merely *representing* transformation, what I call starburst animation epistemologically embodies the nature of change through its intervallic alternations of light and dark stimuli and durational manipulation of luminous intensities. As Norman McLaren reminds us: "What happens between each frame is more important than what happens on each frame,"[1] which is to say, this stuttering control of light interpenetrates diegetic and extra-diegetic bodies and objects alike. Like Times Square advertising, some of which was designed by animators,[2] these sparkling starbursts (with their on-off-on blinking process) are visual stimuli that organise our attention, affecting our bodies and our brains and creating a sensual experience. In addition to scintillating light enabled by the alternation of opacity and transparency, both classical and digital animation have repeatedly returned to the luminous as subject of sensual fascination. Compare, for example the bioluminescent aquatic jellies in *Life of Pi* (Ang Lee, 2012) or the seeds of the Tree of Souls on Pandora in *Avatar* (James Cameron, 2009) with the Dewdrop Fairies in the Dance of the Sugar Plum Fairy sequence in Disney's *Fantasia* (Wilfred Jackson, 1940) (see Figure 1). Despite the material differences in the production process (*Fantasia's* effects were achieved through airbrushing and light pencil and pastel shading as opposed to digital effects), commonalities in the treatment of colour, luminosity and detail continue to link classical and digital animation.

Animation's structural engagement with scintillation or luminosity also enables it to showcase the sensual pleasures of colour. As I've argued in a previous paper, the representation of test tubes, pipettes, beakers, flasks, bottles or other transparent or translucent glass objects that appear in laboratory or transformation sequences like the Mickey Mouse cartoon *The Worm Turns* (Wilfred Jackson, 1937) allow for the segmentation of colour into tubular, rectangular or spherical form, offering up Technicolor as a novelty production value, which is also dazzlingly spectacularised (Thompson 2013, 6). As the cartoon opens, Mickey is in a laboratory creating a potion that will turn underdogs into top dogs. Called the "Courage Builder," it sets triumphant flies against spiders and cats against dogs. Certainly colour and line in the laboratory scene illustrate Disney's pioneering innovations in the special effects department in the late thirties, as the animators who specialised in drawing light, water, fire and other atmospheric effects were so named. It is they who use colour to simulate a richly textured dimensional mise-en-scène, with chiaroscuro lighting effects of Mickey's shadow cast behind him, an unseen light source shining through meticulously detailed glassware and white paint simulating light bouncing against the edges of the beakers and flasks, while highlights and light coloured blue, green, purple and red bubbles indicate the volumetric mass of the liquid colour within. But the media of

[Inter- and Trans-Mediality —](#)

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[Blood — Holly Randell-Moon](#)

[Intermediality and](#)

[Interventions: Applying](#)

[Intermediality Frameworks to](#)

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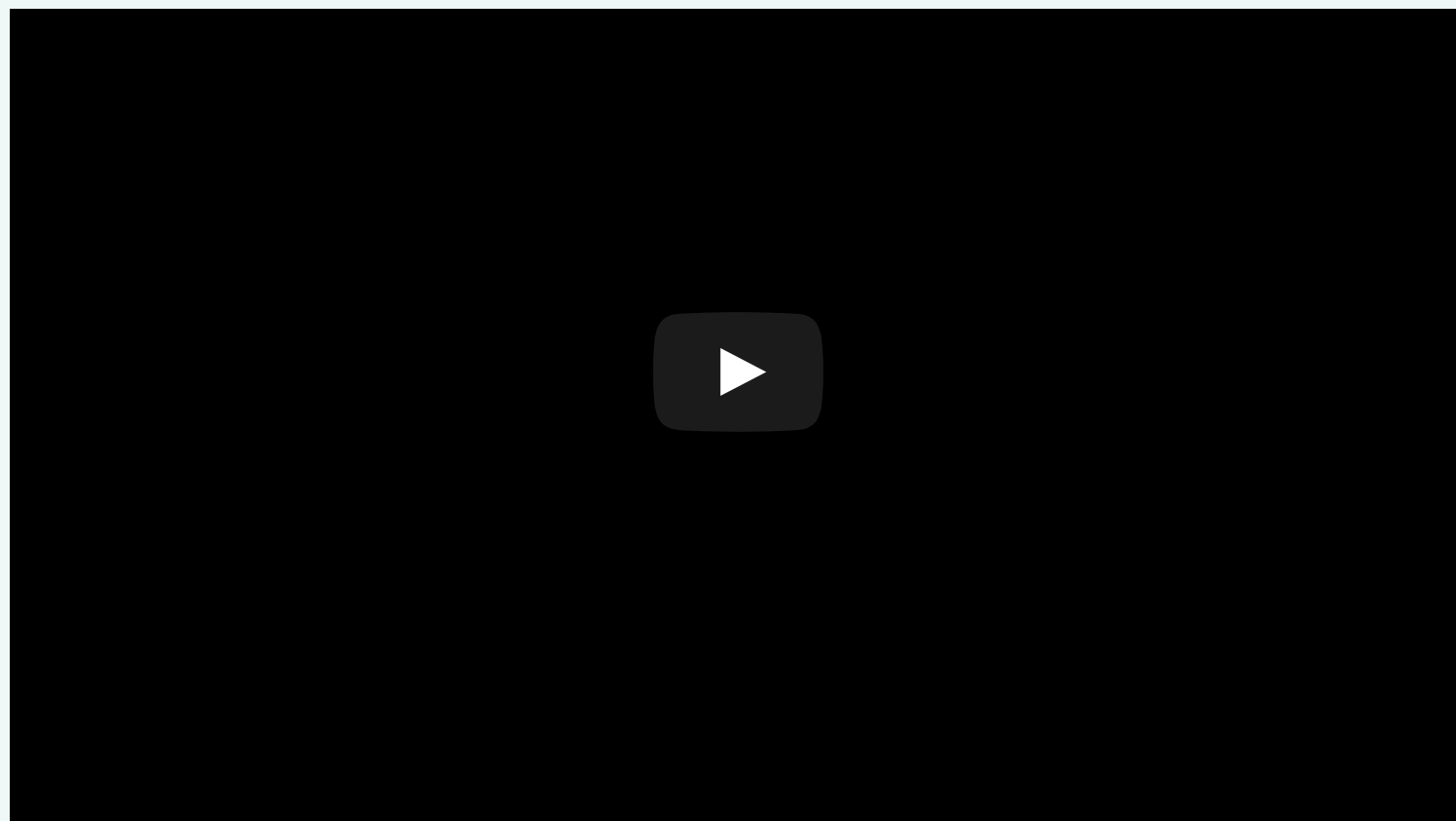
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the laboratory, the transparent glassware and translucent liquid, also offer the pure pleasure and novelty of rich saturated hues, of colour as segmented forms. As Mickey mixes his ingredients, the colour bubbles, splashes and pops. Accompanied by coughs, splutters and backfiring automobile sounds, the diegetic liquid erupts from the test tube becoming pure spectacular excess. As Brian Price has suggested of abstract colour sequences in the films of Claire Denis and Paul Thomas Anderson, “liquidity is but another way of describing the bleeding of color across line” (2006, 85). And as Rosalind Krauss has suggested, when colour disrupts the line, as it does in this Mickey cartoon, it has two principal effects: eroticising the surface, and enjoining a perceptual multiplicity (cited in Price 2006, 85), that accentuates fluidity, process and transformation.

The relationship of the translucent and the opaque also come together in the frequent visual figure of the iridescent bubble in animation. Like the eye, a bubble is a sphere with a reflective surface like a screen and can be transparent or semi-transparent like a cel. The bubble is a liminal temporal and spatial figure—it is a pellicle or thin diaphanous surface of colour with an iridescent sheen, suspended between atmospheric air, and the air within it. As colour was for Goethe, the bubble is a boundary condition, of inside and outside (2006, 16). Like the arrival of Glinda the Good Witch as a bubble of pure pink who becomes the pinky ‘goodness’ of whiteness in *The Wizard of Oz* (Victor Fleming, 1939), a bubble is also a colour skin, an example of the second type of light condition that Goethe called the dioptrical in his *Theory of Colors* (2006, 33) where colour is produced by passing through a light transmitting or transparent body such as atmospheric haze, water, or glass. Sam Raimi’s *Oz: The Great and Powerful* (2013) also emphasises the mobile and fugitive nature of the bubble in a *mise-en-scène* in which luminosity and colour populate the crystalline surfaces of Emerald City, with its jewel-like flowers and iridescent butterflies. Bubbles enable both the representational and affective interplay of scale between large and small as well as our wondrous response to this scale, and together with toys are a frequent visual figure in animation for the playfulness and joy of childhood. Part of the fascination of the bubble is its structural and temporal evanescence—the iridescent surface, say of a soap bubble is only possible for a brief period before it snaps or is popped, which produces in us an orientation of wonder at its fragility, and suspense in anticipation of that inevitable pop. Benjamin reminds us in his essay, “On Fantasy” that colour is transition, the passing away of the mortal symbolised in the green halo of rotting meat or the iridescence of a blowfly (cited in Leslie 2004, 265). I’ll come back to the bubble when I turn to Google Glass. But what I want to point out here is that the luminosity, colour and delicate transitory nature of the bubble foreground what I’ve been illustrating in these prefatory remarks on classical cel animation: that is, that animation’s formal and representational concerns with opacity, translucency and transparency are the material embodiments of memory and desire and form centre stage in *World of Color*, to which I’ll now turn.

## Part II: Disney’s *World of Color*



*World of Color* world premiere at the Disney California Adventure theme park.

Reportedly constructed for \$75 million with the aim of reviving Disney’s financially struggling California Adventure theme parks, the 28 minute *World of Color* show premiered on June 10, 2010 and has screened nightly there and at Disneyworld since then (Barnes 2010) (See Figure 2). It projects sequences from many of Disney’s best known classical and contemporary animated films on ephemeral materials: the bubbles, water spray, fog and light produced by nearly 1200 variable fountains, each of which are illuminated a different colour with an LED ring light and choreographed in time to music and alternating jets of fire. Its ephemerality is of course nominal, as at the level of both production and exhibition the *World of Color* is an intensely programmed repeatable event operated by an underground control room (see Figure 3). Five years in the planning, the show was developed by Walt Disney Imagineering in association with its Animation and Pixar companies and technical specialists in laser, projection and fountain design.[3] On 3.5 acres in Paradise Bay Lagoon the show features eight different types of fountains that shoot up to 200 feet and 18,000 computer-controlled elements of colour intensity, water angle and height, arranged on a huge football field size platform which raises itself at the beginning of the show. What is interesting is the show’s unusual

combination of structurally fixed digital and hydraulic effects and ephemera, insubstantial mist screens, some 50 feet tall and 380 feet wide produced by 28 projectors, of which 14 are fully submersible (Disneyland 2010).



Figure 2. World of Color view of Ferris wheel and Paradise Park. ©Walt Disney Productions. This promotional photo is licensed under Creative Commons Attribution-Share Alike 2.0 Generic license.

The mist screens are the appropriately aquatic surface for a show which self-reflexively begins with Ariel singing ‘Part of Your World’ in *The Little Mermaid* (Ron Clements and John Musker, 1989), followed by Sebastian’s rendition of ‘Under the Sea’ (See Figure 4). The show is a pastiche musical theatre bildungsroman, where emotional yearning is born from spatial disaffection. Animated sequences from *Aladdin* (Ron Clements, 1992), *Up* (Peter Docter, 2009), *Toy Story* (John Lasseter, 1995) and *Wall-E* (Andrew Stanton, 2008) move from under the sea into sky and space, with sequences using colour and vertical water movement isomorphically to articulate upward spatial aspiration

and affective longing of the characters (and by extension, audience) such as when Ariel sings of her desire to go up “out of the sea / wish I could be / part of that world.” Heightened by Mussorgsky’s ‘Night on Bald Mountain’ score, the *World of Color*’s dramatic middle section features Chernobog’s massive devil from *Fantasia* (Wilfred Jackson, 1940), along with other emotionally intense Disney sequences, from *The Old Mill*’s storm (Wilfred Jackson, 1937) to the stampede in *The Lion King* (Rob Minkoff and Roger Allers, 1994) and the ghost ship in *Pirates of the Caribbean* (Gore Verbinski, 2003). This dramatic climax is followed by quieter musical sequences of paternal and maternal reassurance from *Bambi* (Dave Hand, 1942), *Dumbo* (Ben Sharpsteen, 1941) and other features, concluding with a reprise of the title song ‘The World is a Carousel of Color.’



Figure 3: World of Color Control Room. ©Walt Disney Productions. This promotional photo is licensed under the Creative Commons Attribution-Share Alike 2.0 Generic license.

Continuing a long Disney tradition of using water as a key design aesthetic, the show’s innovative projection onto differently textured two and three-dimensional surfaces and spaces created by transparent sprays, walls, columns and reflections of water, light and fire, is a collage of shifting displays and painterly inscriptions, and one whose blurriness, hybridity and dimensionality marks out its difference from the source animation from which it takes or simulates.[4] Over 100,000 animated images make up the show including newly created sequences in sand animation by artist Corrie Francis, as well as 12 foot high paper cut-out characters created by

Megan Brain which were then animated (Sukovaty 2010).

Steven Davison, Disney’s vice president for parades and spectacles, described a *Pocahontas* segment this way: “[She] was animated in one spot. You had to paint her with a brand new CGI river and get her to come in and out of it at 10 different points” (Slate 2010). New animation was needed because long takes of individual characters could not always be found in the original source material of the feature films. Paradoxically, Disney’s new animation recreates its classic films in the service of a show that addresses or manufactures our nostalgia for these films. Not only is the novelty of the show’s ephemeral medium emphasised in its marketing, so too is the Heraclitian flux of its aquatic medium both visual subject and musical theme. As Pocahontas sings, “What I most love about rivers is you can’t step into the same river twice. The water’s always changing, always flowing.” More than that, the water is affective extension, pure wish fulfilment, for as Pocahontas continues, “People I guess, can’t live like that. We all must pay a price to be safe.” The constant flux and unending transformation of the show’s aquatic medium embodies the impossibility of the desire for a return to one’s childhood, even as it seems to offer paradoxical satiation through its symphonic tour of the Disney canon.



Figure 4. Aquatic self-reflexivity with Ariel from *The Little Mermaid*.

Playing with appearance and disappearance, and epitomised by an ever-dissolving Cheshire Cat, the mutable layers and variable vertical heights of the fountains are a moving sculpture, which prompt both expectation and surprise. Bellagio-like, upthrusting fountains juxtapose with a second layer of lazier and slow arcing brushwork (see Figure 5). However, unlike the famous fountains of Las Vegas’ Bellagio Resort, the colour ring and lasers intensify the spectacular

dimensions of the choreography by offering a density to the water, while the animated image is reflected and refracted creating a three dimensional image. Davison

describes it as “painting with water” elaborating, “We wanted to take fountain technology—varied planes of water, different textures of water—and use it to tell stories in a new way” (Barnes 2010).[5] The projection of an animated image that is essentially softer than normal, because of its aquatic screen surface, is sidestepped in company promotional videos, which emphasise the transparent sharpness and clarity of the coloured line presented by columns of illuminated water. As Davison reiterated in an early preview of the show in 2009, “the clarity of it is beautiful” (2009, part 1).[6] Indeed the latest incarnation of the show *World of Color-Winter Dreams*, recently unveiled for the 2013 holiday season, promised an image four times sharper than the original show with a new HD projection system (Disneyland 2013). This emphasis on crispness also highlights the show’s marketing of nostalgia, in which the misty screens and ephemeral surfaces seem to externalise and materialise the audience’s memories and desires for the Disney films of childhood.



Figure 5: View of Fountains. ©Walt Disney Productions. This file is licensed under the Creative Commons Attribution-Share Alike 2.0 Generic License

Davison’s claims of technological innovation link the show to a longstanding company tradition as an early adopter of colour technologies, as the first company in the film industry to use three strip Technicolor in its pioneering Silly Symphonies (1932-1935), to its early shift to colour television for NBC in September 1961. Opening with Dick Wesson’s voice-over and an updated version of the Sherman Bros’ famous song ‘The World is a Carousel of Color’, the show is an homage to Disney’s original television series *The Wonderful World of Color* (1961-1969). The spectral array of fountain and laser columns that serve as the show’s spectacular leitmotifs also recall Disney’s repeated recourse to the rainbow as

an iconic attraction in cartoons like *Funny Little Bunnies* (Wilfred Jackson, 1934).[7] As a recurring image, the rainbow offers a central metaphor for the show’s nostalgic promise: proffered, yet never fulfilled, as tricks of light and colour, the rainbow can never be reached.[8] The *World of Color* performs the prowess of the company’s technological innovations with a nostalgia for its own corporate history and one that we have always been invited to regard as an extension of our own personal history.

Of course the *World of Color’s* technological innovations rest on a longer history of Renaissance and Baroque fountain design, themselves dependent on Greek, Roman and Persian engineering, and whose theatricality, display and monumentality, in the work of Renaissance artists like Tommaso Francini’s fountain designs for Henry IV of France could be considered antecedents of Disney’s aesthetics.[9] They borrow from the discursive playfulness of water and music or *giochi d’acqua* (water tricks) such as the Villa d’Este’s Fountain of the Dragons or the Pratolino’s Grotto of Cupid, which surprised visitors with water squirts. Baroque fountains like those built for Louis XIV at Versailles sculpted water as emotional movement, also combining fireworks and music (Attlee 2008, 51ff). The nineteenth century brought with it the mechanically illuminated fountain, such as the American Bartholdi fountain of 1876 that first used coloured lights fuelled by gas, adding a luminosity to water (Smithsonian Institution Research Information System). The invention of steam pumps meant that fountains no longer depended on gravity for their propulsion, allowing water to become ever more extravagantly decorative. This capacity enabled our own era’s large-scale performative fountains which, in addition to the enormous heights of Las Vegas’ Bellagio and Geneva’s Jet d’eau, include the Dubai fountains, those in Efteling Theme Park in the Netherlands, and King Fahd’s fountain in Saudi Arabia, the tallest in the world at 312 metres (or 1023.62 feet). From Rimington’s colour organs to the *Son et Lumière* light shows, *World of Color’s* scale, playfulness and sculptural expressivity are situated within longer intermedial traditions in which the control of light, colour and music awe, dazzle and emotionally manipulate. [10]

*World of Color’s* physical location within Disney amusement parks also historically situates it within what one may call the second golden era of the amusement park, or more particularly the theme park marked as beginning in the postwar era with Santa Claus Land in 1946, paradigmatically with Disneyland in 1955, followed by Six Flags in 1961, and many others, from Universal Studios to Dollywood.[11] Lauren Rabinowitz’s recent study of amusement parks tells us of the first wave of construction which resulted in 2000 parks built between 1893 and 1915, and whose most famous exemplars were Coney Island’s Dreamland, Luna Park and Steeplechase and Chicago’s Riverview Park (2012, 1-35). Her close study of the postcard photography of these parks (in which crispness and clarity are also key) show scenes that could be taken today at Disney’s show, with the Ferris wheel and jetting fountain dominant visual elements (96ff). These parks helped define a new concept of urban modernism: the celebration of motion and speed, the beauty of industrial design, and the experiential interaction of spectator and surrounding crowd (26). Their modernity lay not only in their architecture but also in their sensorial address: a visual stimulation of electrified spectacle and sound and an

embodied kinesthesia of rides and dynamic crowds.

Like the amusement park in which it is situated and of which it is a spectacular extension, *World of Color* relies upon a similar bodily address, linking the technological construction of spectacular vision and motion across different modes of entertainment (Rabinowitz 2012, 59). The huge wall of water advancing to the spectator in the show's dramatic middle section was calculated to "put you in the middle of the [Lion King's] stampede" (Davison 2009) just as the heat jets make you feel the fire of Chernobog's inferno. The show has genealogical affinities to the nineteenth century amusement park's largest spectacle, the pyrodrama and the disaster genres. The pyrodrama was an intermedial fusion of theatre and fireworks, ornately painted sets and panoramas orchestrated by auteurs like James Pain, while the disaster genre blended theatre, circus, panorama and magic tricks. Like the *World of Color*, audiences in their thousands gathered around lagoons, which acted as both protective safety layer and reflective surface (Rabinowitz 2012, 52-59). Not unlike Disney's Fantasmic show and Epcot's Fountains of Nations, precursors to *World of Color* that fused theatrical performance along with fireworks and fountain displays, audiences at the nineteenth century disaster genre would gather to watch large theatrical casts reenacting historical events, from the Fall of Pompeii to the Great Fire of London to Civil War battles. Unlike the Fantasmic and its nineteenth century precursors, *World of Color* offers no human actors, although Disney Imagineers refer to the fountains as 'actors', even naming a small orange fountain 'Little Squirt' to memorialise the energy and spirit of the company's founder. Davison describes the fountains' role this way, "They become the emotion and the energy and the drama" (2009, part two).[12]

Despite the undeniable sentimentality of Disney's musical theatre traditions, the show's choreography of sound, light and colour stimuli in elaborate rhythmic patterns of movement produces a transitory yet hypnotic spectacle. Light and water effects combined transform the spectator's sense of space through their *extensive* qualities or ability to shift, fill and colour space and their durational *intensity*, or metrical rise and fall in space. The synaesthetic combinations of visual, auditory and haptic elements immerse the spectator in constantly transforming, propulsive, surging worlds, or what child psychologist Daniel Stern has described as "vitality effects," whereby rising and falling movement exemplified by tunnelling, radiating or oscillating light, in conjunction with three dimensional vertical and horizontal display and sensorial address produce an affective charge of intense pleasure and wonder (1993, 54). Pulsating lights around the Ferris wheel are accompanied by rapid horizontal sweeps of fountains in circular or oval patterns around the spectator's field of vision, which enhance a sense of the show's immersive proximity. Water and its cooling spray or the heat of fire jets fills the air with dynamic energy. Viewer responses to the show express ecstatic delight in the show's colour patterns and iconic characters, mixed with physical exhaustion at the culmination of a day's activities. For example, Amanda L. of San Diego posted on *Yelp*: "This show blew me away! With the water pyrotechnics, the FIRE, and the projection of Disney classics on water mist. Breathtaking! Maybe I was delusional because of the long day that I had just endured but I was so amazed! It was literally the perfect way to end a long day at the park! And made me feel all sorts of warm and tingly nostalgia." [13]

### Part III: New Media and Google Glass

With 2012's introduction of 'Glow with the Show', or programmable translucent Mickey Mouse Ears worn by spectators which change colours through infrared signals (see Figure 6), the immersive dimensions of the *World of Color* are intensified (Disneyland 2012). Extending and enfolding the 4000 spectators into the exhibition space, the spectator's body becomes an additional pulsing and affective modular unit in a light and colour spectacle in which colour becomes ever more sculptural. Interestingly, YouTube video of the Mickey ears in the show makes clear the audience's embodied responses: with bobbing ears showing spectators dancing in time to the songs, as well as frequent rotation as people turn around and look at their fellow audience members and the changing colours of their ears ("Glow With the Show" 2012).

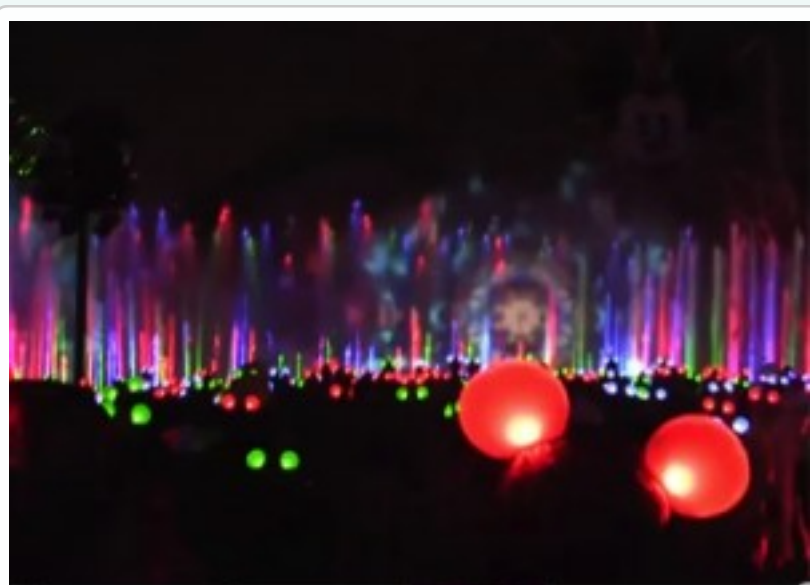


Figure 6. *Glow with the Show Ears*. ©Walt Disney Productions. Frame Grab from Promotional Video <http://www.youtube.com/watch?v=qVe93Vhbpxk>

Blending the projector and the body, the screen with the spectator, Disney's instrumentalisation of the body as site of both exhibition and reception in *World of Color* is shared with new wearable digital devices that combine transparency and opacity as an essential part of their tactile pleasure. Apple, Google, Samsung and Microsoft are all currently working on mobile interfaces from headsets to watches that connect screens on our wrists or our eyes to smartphones, and that allow us to surf the Internet, take photos or videos and post them online.[14] Through augmented reality, wearable devices like Vuzix M100 Smart Glasses (which work with Android phones) animate our worlds by combining transparent headsets

with translucent commands or opaque data of specific interest to a particular location. Google Glass is a wearable headset, which uses a transparent LCoS (Liquid Crystal on Silicon) display to put information in

front of our eyeballs, and according to its promotional material, uses the bones in our skull to conduct sound “into your inner ear.”[15] It responds to commands prefaced with “OK Glass” to record a video, take a photo, translate a word, or look up something, and can also be operated through taps on a touch sensitive bar on the side of the eyeglass frame. The gestural economy of strokes, wipes and pinches that animate our movement through our iPads and iPhones, Androids, Surfaces and other tablets has transformed our relationship with new media devices, and with Google Glass can now be expanded to include new gestures, such as the wink and the nod.[16]

In its mimicry of Apple’s clean white and titanium aesthetics, Google Glass’ graphic design exemplifies a *bubble* aesthetic, with its translucent circular menus that ‘pop’ up on the screen (with attendant bubble sound effects) and then float upwards out of sight, which appeared in Google’s early concept videos in 2012. This aesthetic choice does more than connote the playfulness and wonder of childhood, for Google’s 2013 promotional video even shows a child blowing a giant bubble, suggesting that wearing Glass means that the evanescent can always be captured, always archived (“How It Feels”, 2013). Although the 2012 menu design has now changed, 2014 Google videos retain the bubble’s light and playful associations with childhood, and invite us to “live lighter.”

Glass’ augmented reality depends upon a palimpsestic construction of the world in which overlays of virtual data, menus or icons are superimposed on our surrounding reality, such as Glass’ promotional video in which the wearer activates a language translation from Mandarin to English, with “OK glass, Google ‘say half a pound in Chinese’.”[17] Mike Cohan of VR Total Immersion has criticised Google’s claims of augmented reality, recently arguing, “There [has been] very little understanding of what Augmented Reality really is and what it requires. I would describe it as mixing real and virtual on a screen in real time. Just having a video overlay like Google Glass is not Augmented Reality” (Smith 2013). If Cohan’s critique is correct and Glass is merely a superficial overlay on our world, Google’s invocation of bubble aesthetics claims something else: that being in the Google Bubble is a magical, indeed transformative mediation of the everyday.

Two last points about Google Glass before we return to Disney’s *World of Color*. Since Google launched its initial advertisements in 2012 and with its recent announcement that it will be rolling out its first consumer devices in 2014, the first Glass spoofs emerged (Zeevi 2012). In these parodies, two principal problems of the device are circulating, with the first problem being opacity. Rather than the transparent, clean interface promised in Google marketing, the visual proliferation of commands, symbols, screens and ads will so clutter and impede our vision that the interface becomes a hazard—we will burn our hands while pouring coffee because our depth perception is altered, and we will walk out into traffic or bump into people, all because we have placed an interface between ourselves and the world. A related concern is the need for the eyes to continually adjust focus between the translucent interface or commands and objects in the outer world in a variety of different fields of vision. As commentator Adam Greenfield describes it, “there is a vaguely autistic note to what they are talking about with Google Glass” (Martin 2013). *Dashburst* has sixteen Glass videos and comic parodies, including # 11 “A New Way to Hurt Yourself” and # 13 “Project Dangerous Glasses” in which simulated Glass POV videos show how web advertising will inevitably appropriate our visual real estate and endanger our safety (Zeevi 2012). Indeed, so widespread have these parodies been that Google has felt the need to respond, emphasising that the viewer’s field of vision is designed to be in the upper right part of the headset, and that impeded vision will not be an issue (Solomon 2013).

If one problem is that Google’s interface is dangerously opaque, a second set of parodies suggest that Glass is dangerously transparent, or both invisible and hypervisible. Invisible, because Google Glass’ archiving capacity to record, photograph and post to the internet can be activated, not only through voice commands but nominally through socially invisible hand gestures, head nods or winks. But as *Saturday Night Live*’s ‘Google Glass Sketch’ suggests, and as the exaggerated head jerks and other tic-like motions of Fred Armisen as fictional tech blogger ‘Randall Meeks’ show, the user interface can be hypervisible too (Seifert 2013). In *Saturday Night Live*’s parody, the hyperbolic depiction of technical bugs and the awkward physical interactions between Google user and social observer resituates the problem of Google Glass’ threat to privacy as safely within the socially visible realm (at least for the time being), yet of course also marks a future where the headset becomes as ubiquitous as our smart phones are now, and where we can, and always will be recorded without our knowledge. As Edward Soja has put it, where the illusion of opacity inflates space to a universal ‘given,’ the illusion of transparency reduces it to a subjective condition. While the former illusion tends to reify space, the latter tends to dematerialise it (Soja 1989, 124-127).

So far, in my examination of Google and *World of Color* I have been playing with two meanings of the word transparent. The first, meaning ‘conductive to the uninterrupted passage of light’ and suggested by the wearer’s Glass interface is one in which space is first dematerialised, only to be re-enlivened through instantaneous archiving. It is one which Google wants us to see as a ‘reanimation,’ indeed spectacularisation of the everyday, and that collapses the temporal and spatial relationships between experiencing and recording, between seeing and wearing. The second meaning of transparency, as ‘easy to see or recognise’ is not only the social problem of that collapse, but also of the invisible structures such as data mining and

algorithmic marketing, which are produced by a corporation like Google deeply invested in maintaining the invisibility of its internal operations. For Disney's *World of Color*, the night time spectacle dematerialises exhibition space as well as screen surface, only to re-project and re-animate it as an immersive, tactile experience, where our field of vision is filled with light, just as our bodies become modular light elements in the show. Where Google Glass wants to draw the world into us, transforming it into depthless 2D, *World of Color* wants to extend the display outwards to us as curving multiplanar layers. Where Google Glass's boundaries are indeterminate with our own bodies, collapsing inside and outside, so too does *World of Color* challenge perceptual boundaries with its colour baths, reflected light, water spray and heat effects, and, in the case of "Glow with the Show" collapsing reception with exhibition.

The structural persistence of material, conceptual, and aesthetic relationships between transparency, translucency and opacity in new media forms like digital animation or Google Glass exemplify what Richard Grusin has recently named as atavistic cinema. That is, "outmoded cinematic traits that appear to have gone extinct" yet which reappear in the era of new media (2013, 2). By remediating older attractions such as the pyrodrama and disaster genre, the mechanical musical fountain and the light show with projected classical and digital animation, *World of Color* shows how the structural relationships between transparency and opacity persist, indeed *especially* at that historical moment in which computer animation has replaced cel animation and when celluloid cinema's death knell has sounded. Building on older theatrical traditions of spectacular design *World of Color* showcases transitory yet atavistic pleasures in their elemental forms: air, fire, light, water. By incorporating us into the show, Disney's *World of Color* suggests that 'animation' can be understood not only as specific technical and material processes, but also as a perceptual and corporeal transformation in which movement, light and colour enlivens, indeed 'animates' individual bodies even as it reifies us as part of the spectacle. Paradoxically, through its projection effects and misty surfaces it reminds us again of cel animation's materiality, glimpsed in and alongside its digital replacement. Yet most of all, *World of Color* wants us to believe with our very bodies that the iconicity of Disney's characters lives in, but always transcends the transparent, the (cel)luloid and the ephemeral.

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## Notes

[1] As both Suzanne Buchan and Maureen Furniss (2013) have noted the provenance for this varies. It has variously been reported as delivered by McLaren in a Lecture in 1961. See Ernest Callenbach (1962-1963). Maureen Furniss reports a letter exchange between Georges Sifianos and Norman McLaren in 1986 in which the meaning of this statement is discussed (1998, 12, n. 8). McLaren's statement is also published in André Martin (n.d.) and in *Cinema* (1957). Both McLaren and Len Lye used *direct animation*, or scratching or painting directly onto the filmstrip, in which relationships of light, transparency and opacity are central.

[2] For example Otto Messmer's Epok advertising of the forties. See Moana Thompson (2014), Tell (2007) and Canemaker (1996).

[3] The Fountain People developed eight different fountains for Disney, which included grid, chaser, single water whips, dual water whips, flower spouts, dancers, butterflies and geysers. See Anon, "Fanciful Fountains Take Center Stage in Spectacular *World of Color* Show at DCA," at <http://www.mouseinfo.com/forums/dlr-news-info/91956-fanciful-fountains-take-center-stage-spectacular-world-colora-show-dca.html> for detailed descriptions of these fountains. According to Libby Slate the specifications included the following, "The fountain control system was devised via a partnership between Disney, MA Lighting, and Fisher Technical Services, Inc. (FTSI), using inputs from grandMA 2 consoles using MA-Net protocol and outputs EtherCAT industrial machine protocol to the fountain systems. The system was conceived by technical producer Chuck Davis and fountain programmer and designer Jason Badger. The entire operator interface comprises four grandMA 2 consoles, seven NPUs, and a replay unit. Special LED lights were developed for each fountain, and laser effects were designed by Claude Lifante, with 4 Phaenon 15500 RGB diode-pumped lasers that mix for 13W of light" (2010).

[4] As Robin Allan (1996) has noted, water has been a frequent subject in Disney animated films and a key design element in Disneyland.

[5] The Bellagio fountains were designed by WET or Water Entertainment Technologies. Co-founded in 1983 by Disney Imagineers Mark Fuller, Melanie Simon and Alan Robinson (who were involved in fountain design for Walt Disney World and the Fountain of Nations for Epcot), it illustrates the interconnections between Disney and the wider world of innovative water design.

[6] The team described the technology necessary to produce the high definition projection of the images with

“twenty-eight Christie Roadster S+20K projectors served by 12 Green Hippo Hippotizers routed via a Vista Spyder to blend and setup the large multi-projector screens” (Slate 2010).

[7] For more on Disney’s innovations in colour cinematography, see Telotte (2008) and Neupert (1985, 1990, 1999). For further reading on Disney colour and its relationship to space, see Telotte (2010, 76-77).

[8] I thank my anonymous reviewer for these and other connections.

[9] For further reading on the technology, engineering and aesthetics of fountain design, see Adams (1979), Attlee (2008) and Symmes (1998).

[10] For more on Rimington’s colour organs, see Yumibe (2009, 2012, 33-36, 39). For *Son et Lumiere* see entry at *Encyclopedia Britannica*, <http://www.britannica.com/EBchecked/topic/554172/son-et-lumiere>.

[11] For more information on Santa Claus Land see *RoadsideAmerica.com* (n.d.) and Adams (1991).

[12] *Mouseinfo.com* describes the *World of Color’s* eight types of fountains as the show’s ‘breakthrough stars’: “These eight versatile performers made their debut June 11. While they are apt to respond to applause with grateful encores, no autographs, please” (2011). See also Davison (2010).

[13] Yvonne L. of La Jolla posted on *Yelp*, “Fifteen minutes in and I’m weeping at the beauty of the show and the passing of my childhood and all the emotions I didn’t know I could feel. I’ve seen it three times and I am more amazed each time” (August 31, 2013). Accessed November 18, 2013.

<http://www.yelp.co.nz/biz/disneys-world-of-color-anaheim>.

[14] See Solomon (2013), Rougeau (2013a, 2013b). L. Frank Baum, author of *The Wizard of Oz* series, wrote a short story for boys called “The Master Key” that premediated a number of futuristic inventions in its narrative of a boy who inadvertently summons a Demon of Electricity. Along with the taser, a wireless phone and a number of other gifts, the boy is given a pair of electrical spectacles called the Character Marker. Handily, the spectacles superimpose letters on the people around him, whether G for ‘good’, F for ‘foolish’, E for ‘evil’ etc., and are a proto form of augmented reality. Available at *Project Gutenberg*.

<http://www.gutenberg.org/cache/epub/436/pg436.txt>.

[15] Google Glass.com, <http://www.google.com/glass/start/>.

[16] The Apple iPhone’s famous incorporation of Corning’s Gorilla Glass was motivated by the aesthetic superiority and tactile pleasure of glass as an interactive surface (Walter Isaacson 2011, 471-72). After privacy concerns about Mike Giovanni’s app ‘Winky’ were raised, Google removed this app and also stated that Glass will not use facial recognition software. It has attempted to reassure the public that operation of Google Glass will be socially visible, “We have built explicit signals in Glass to make others aware of what’s happening ... In each case, the illuminated screen, voice command or gesture all make it clear to those around the device what the user is doing” (Solomon 2013).

[17] I use the term palimpsestic, not only because of its historical significance in cel animation, but also because the trace left by Google Glass is in the form of the archived audio or video recording.

**Bio:** Kirsten Moana Thompson is Professor of Film Studies and Director of the Film Programme at Victoria University, in Wellington, New Zealand, and previously Associate Professor and Director of the Film Program at Wayne State University in Detroit. She teaches and writes on animation and colour studies, as well as classical Hollywood cinema, German, New Zealand and Pacific studies. She is the author of *Apocalyptic Dread: American Cinema at the Turn of the Millennium* (SUNY Press, 2007); *Crime Films: Investigating the Scene* (Wallflower: 2007), and is currently working on a new book on Colour, Visual Culture and Animation.



