

Reviews

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Recordings

Andrew May: *Imaginary Friends*

Compact disc, 2013, RR7861; Ravello Records, 223 Lafayette Road, North Hampton, New Hampshire, USA; telephone: (603) 758-1718; electronic mail info@ravellorecords.com; <http://www.ravellorecords.com/>.

Reviewed by Ross Feller
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According to the one sheet for *Imaginary Friends*, composer Andrew May's compositions "defy classification, seamlessly blending the personal expressiveness of traditional classical performance with the alien landscape of ambient computer music." This statement does a good job mapping out the territory that May covers on this, his debut release. But it only tells half the story because he also uses conventional computer processing techniques, and deftly traverses alien acoustic landscapes.

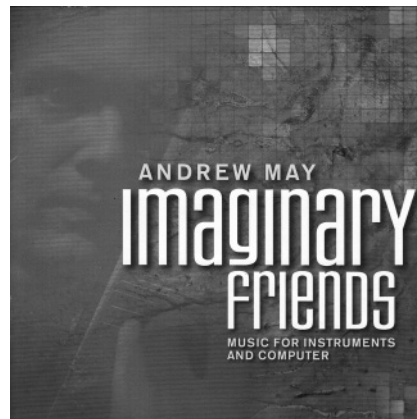
The first piece on this disc, *Shimmer*, is scored for piano and electroacoustic sound. The title refers to a poem by Ralph Waldo Emerson. May presents us with quickly shifting, freely atonal palettes alongside analogous processing changes. There are also clear, yet temporary, centric pitch areas that successfully push the listener in a given direction, only to

be diverted by other pitches also used as center points.

Until about a third of the way into this 12-minute piece the piano and computer follow separate, hierarchically divided trajectories. After four minutes or so, aspects of computer processing are foregrounded. May uses a wide array of processing techniques, including delay, reverb, flange, chorus, equalization, sound reversal, and envelope truncation. *Shimmer* uses prerecorded electroacoustic materials, but they are so well integrated that upon listening without having first read the liner notes, I had assumed that this was an interactive piece. Much of the prerecorded materials were from recordings that the composer made of the pianist playing through initial sketches for the piece.

Around the two-thirds point there is a climactic, rather artificial sounding downward glissando that clearly draws attention to itself, especially because it is set apart by silence and initiates a different type of texture. Until this moment the predominant texture consisted of fast tremolo flourishes mostly in the piano part. After the glissando, the texture becomes much more subdued. Combined with the focus on reverb, this change causes one to experience a visceral sense of spatial distance. Toward the end of the piece the tape and piano parts attempt to sync up in a series of rhythmic unison passages that eventually conclude in F.

Chant/Songe, for clarinet and computer, uses a wide frequency range, including very low frequencies that are not always apparent in digitally generated computer music. The harmonic pacing is much slower than in the first piece. Large parts of this piece feature admirably sparse textures. May carefully and masterfully crafts each subsequent phrase, from silence to thick textures, and back to silence. At times the clarinet



seems to recede into the background, perhaps because of the overlapping frequencies shared between it and the computer. Additionally, we hear the live clarinet through the same audio settings, whereas the computer's materials sound like they are in continual flux. Thus, they command more attention than the clarinet. Although one can clearly discern the clarinet from the computer, its recorded invariance leads this listener to want the clarinet's live-to-processed mixture to break out of its "box."

Nevertheless, one of May's compositional strengths is evident in this piece: He knows how to write for acoustic instruments while skillfully mixing in electroacoustic components. For example, in *Chant/Songe* the clarinet performs several bi- and multi-phonics while the computer reinforces these unique timbral resonances, providing them with a resonant acoustic space.

Retake, the third piece on this disc, begins with some breathy, high-pitched whistles and flute sounds. An occasional snare drum hit disrupts the mostly continuous texture. Interestingly, the snare drum timbre never evolves, and so remains a fixed, accompanimental element to the live flute. The computer-generated tones, combined with the live flute, produce

piercing difference tones that sometimes sound disturbingly loud. These are especially evident in the thicker textures in this piece. Toward the end, the flute plays a series of long, sustained tones that might be described as mournful, especially given how they microtonally slide around at their terminal points. The computer processing in this piece involves the effective use of spatialization, both with respect to panning and depth.

The next piece, *Ripped-Up Maps*, for solo instrument and computer, features the composer himself ably performing on a five-string electric violin. The electric violin is blended well with the computer part. Additionally, they both exhibit natural and artificial sounds. This piece is improvisatory and can be performed by any monophonic solo instrument. The composer describes the relationship between the live instrument and computer as a "closed loop of interaction." The soloist influences, but cannot completely control, the computer. The title refers to a mapping process in which input data about the soloist's materials are correlated with the output according to different algorithms. The composer has revised the program for this piece many times since it was initially composed in 1996. The version on this disc dates from 2011 and involves effects that would not be possible without the technology used. These include such things as sped-up pizzicati that human performers would not be able to perform.

Ripped-Up Maps progresses in a wavelike manner, from mildly sparse passages to full-throttled textures that challenge the listener. Although I found this piece to be an effective composition, it also seemed to ramble on a bit. The freely atonal materials favored by the composer tend toward a kind of equivalence that avoids the navigation of sharp corners that

one might expect from ripped-up maps.

The Twittering Machine, the fifth piece on this disc, is another work for flute and computer. Dating from 1995, it is the earliest work on the disc, and represents the composer's first foray into the world of interactive computer music. Surprisingly perhaps, many of the hallmarks of May's compositional style are already fully formed in this piece. Although his processing techniques seem to be somewhat simpler than those used for other pieces on this disc, they are used in clearer, more direct ways, which is ultimately quite convincing. The composer organically builds the computer's materials from overlapping playback of flute soundfiles and delay effects. The flutist controls the pacing of events with a foot pedal used to trigger each new set of events. This piece was inspired by the eponymous painting by Paul Klee. According to the composer's liner notes, "as in Klee's painting, grotesque birdlike forms arise from abstract shapes, framed by a shifting wash of color."

Wandering, for two clarinets and computer, uses a low-frequency drone beneath a fairly busy texture in which the clarinets echo and enhance each other's tones. In the liner notes, May writes that the clarinets "wander in search of one another through a dream-like scene whose details endlessly refract, recombine, and mutate." The clarinets are joined by tambourine, tom-tom, and other percussive sounds that the composer thinks of as "grooves," though he may be thinking of them in an ironic manner.

The overall effect of this piece, especially with respect to its formal trajectory, seems rather flat, like a form with only A sections. There's no real contrast to speak of and the journey upon which the clarinets embark is marked by reiteration rather than development. Perhaps

part of the problem resides in the piece's length, which is a little over seven minutes. It sounds compact and safe given what fills it. If it were, say, twice or even three times as long, the composer might have treated us to a more varied textural palette. It is also worth noting that the score for this piece was partially made out of fragmented materials from the composer's *Chant/Song*, which according to the composer, "the performers may traverse with great freedom." Given this conceptual (and potentially intriguing) scenario it seems possible that the performance freedoms given to the performers may have enticed them to repeatedly take the middle path.

Vanishing, the final piece from this collection is, at a little over 22 minutes, the longest piece on the disc. Written between 1999 and 2000, it is a tour de force of acoustic writing and computer programming. Like *Shimmer* it is based upon a poem by Emerson, but is scored for sampled soprano voice, flute/piccolo, two violas, two cellos, piano, percussion, and computer. The computer plays back vocal samples over the ensemble's "backdrop," while the flute, piano, and percussion serve solo duties. The texture is wonderfully complex and variegated in most respects. Because the vocal part is performed by the computer, the composer is able to move the virtual vocalist around the stage while morphing and multiplying her voice into various colliding and fusing streams. The piece ends with an intriguing, cadence-free, unison passage obliquely suggestive of an Arabic scale. We hear it for a few seconds and then it vanishes. *Vanishing*, certainly one of the best pieces on this disc, showcases the composer's abilities to write for an acoustic ensemble enhanced by a convincing approach to electroacoustic manipulation, fueled by his deep

Mars in 3D

3-D Blu-ray disc, 2013, AIX 86067; AIX Records, 2050 Granville Avenue, Los Angeles, California, USA; telephone: (310) 479-0501; electronic mail orderdesk@aixrecords.com; <http://www.aixrecords.com/>.

*Reviewed by D. Gareth Loy
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On 6 September 2012, the newly reconstituted *Mars in 3D* film and sound track were shown in Dolby Laboratories' state-of-the-art screening room in San Francisco. The occasion was the release of a new 3-D Blu-ray disc of the film, originally written and produced in the 1970s by Elliott C. Levinthal for the National Aeronautics and Space Administration (NASA). Featuring images radio-transmitted from the two Viking spacecraft's missions to Mars in 1976 (Viking 1) and 1979 (Viking 2), the film presents the first stereoscopic views of the Martian surface, giving viewers a visceral and immersive experience of this alien world.

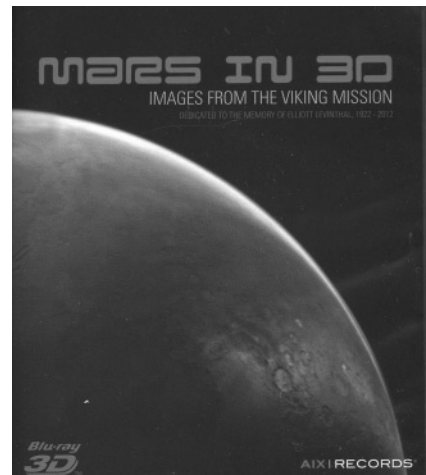
[doi:10.1162/COMJ_r.00188](https://doi.org/10.1162/COMJ_r.00188)

Mike McNabb and Bill Schottstaedt, composers of the original soundtrack, have restored this historic footage, and have resynthesized their soundtrack, achieving truly astonishing video and audio clarity. The result is a tour de force on all levels—artistic, aesthetic, cultural, scientific, and technical.

Each Viking spacecraft consisted of an orbiter and a lander. The orbiters took stereoscopic, still images far above the Martian surface with a single camera by photographing the identical area from precessing orbits (whereby rotational axes were used). The landers took stereoscopic movies of the Martian surface using two on-board cameras. Close-ups of the landing sites provided geologic detail and were intended to help determine whether life existed on Mars; panoramic shots supplied meteorological information.

After the mission, Levinthal, who had been a member of the Viking imaging team, was commissioned by NASA to produce a film that would allow the public to experience the amazing three-dimensional images of the surface of Mars, captured by the Viking missions. The original format of the film required two synchronized 16-mm projectors and stereoscopic glasses to be worn by viewers. The remastered film is encoded for Blu-ray 3-D high definition (1920 × 1080 at 23.98 Hz) with Multi-view Video Coding (MVC format, an amendment to H.264/MPEG-4 AVC). Because MVC can encode sequences captured simultaneously from multiple cameras using a single video stream, it is the ideal contemporary medium for this restoration. The audio can be set to either multichannel Dolby TrueHD, or stereo Dolby TrueHD.

As it pans and zooms stereoscopically across the Martian surface, the film allows the viewer to feel as if he



or she were physically present on the surface of Mars. These images are the stars of the show. Levinthal's narration, in contrast, is delivered in a studied monotone at least as dry as the parched Martian surface, as he explains the imagery, the mission, and its results. But even his stilted delivery does not undo the gripping power of the Martian footage.

Levinthal clearly knew that his film needed music to bring it to life, and he knew that not just any music would do. A Stanford professor at the time, he was aware of the work of John Chowning, then director of the brand-new research project called the Center for Computer Research in Music and Acoustics (CCRMA). He approached Chowning, asking that a computer music score be written to accompany his film. Chowning introduced him to then-CCRMA graduate students Mike McNabb and Bill Schottstaedt, who together composed original music for the film using the new Systems Concepts Digital Synthesizer (Samson Box) that had been built by Peter Samson for CCRMA in 1977.

After the film had served its purpose, it was curated in the archives of the History Office at the NASA Ames

Research Center in Mountain View, California, and was all but forgotten as subsequent space adventures captured the world's imagination.

Thirty years later, in 2010, McNabb wanted to revive the film for a concert series of computer music honoring Chowning's 75th birthday, to be held in a movie theater. McNabb contacted NASA Ames, and found the director's prints in their archives, but discovered that they could not be projected in a modern theater. And so McNabb and Schottstaedt launched what came to be a multi-year restoration project to reconstitute the film and the music into high-definition digital video and audio, using state-of-the-art 3-D cinema technology and digital audio synthesis.

There were many stumbling blocks. No high-quality digital recording of the music had been made before the Samson Box was decommissioned in 1993, and the soundtrack on the original film was low-quality 16-mm optical format. But Schottstaedt and McNabb still had the original score files containing the machine instructions to operate the Samson Box. So Schottstaedt wrote a C program to emulate the Samson Box in software(!) format, which they then used to regenerate the music. Because Schottstaedt's emulator used 32-bit floating-point data throughout, it had much greater arithmetic precision than the Samson Box, and because all internal calculations enjoyed this extra precision, the music rendered through Schottstaedt's emulator achieved breathtaking fidelity.

McNabb tackled converting the film to modern digital cinema format. The two cameras on each lander were separated by 0.8 m, which, when used together, could render 3-D images, but the wide separation caused severe 3-D "fusion" problems. McNabb also had to address the limitations of 16-mm film, such as jitter, varying

shadows and lighting, and color mismatches between the left and right reels. McNabb also found the master dialog track in the NASA archives, so he digitized and denoised it separately, then remixed it with the re-engineered soundtrack and visuals. The film restoration effort took a year and a half, including hundreds of hours of computer processing. The result is visually and musically stunning. It has brought new life to a hidden gem.

The music greatly intensifies the emotional impact of the viewer witnessing the devastatingly strange Martian landscape as though in the first person. Watching and listening, I was arrested by the statically violent vistas unfolding on the screen, powerfully reinforced by the out-of-this-world soundtrack.

I was also struck by the many cultural resonances the movie evoked. The subject, the images, and the soundtrack perfectly capture the American frame of mind in the late 1970s. With the Viking program, the NASA space mission was going from strength to strength. The sky was literally no longer the limit. Silicon Valley (just down the road from Stanford) was poised to explode. The then-novel use of computers to make music was an artistic reflection of this age of scientific and engineering breakthroughs. Finally freed from the constraints of slow general-purpose computers, composers at CCRMA were able to generate music of arbitrary length and complexity interactively, writing nimble software to control the Samson Box, and hearing the results in real time. The highly experimental computer music created at CCRMA in those times was infused with a palpable sense of wonder and discovery. New sonic resources were marshaled to express the seemingly unlimited micro- and macroscopic vistas being opened up

by modern technological advances. It was in this expansive cultural milieu that Levinthal, McNabb, and Schottstaedt created this confluence of art and science.

I was also a composer and programmer at CCRMA during this time, and hearing this music brings back memories of listening late into the night to the sounds emanating from the Samson Box over our shared loudspeaker system as we developed our tools and our music. Not much has been written about the compositional aesthetic of CCRMA, but at least in those days it had a distinct one, which is aptly reflected in the music for this film.

Because I am so familiar with their music, I could easily tell where the composers traded off in the different sections of the film. McNabb's sonic palate is celestial: He developed an additive synthesis simulation of a singing female voice, which he used to create an airy just-intonation choir of angels to accompany the orbiting satellites. Schottstaedt's music evokes the unrelenting frozen violence of the Martian landscape. Filtered noise is combined with mutating sounds of brass and strings, based on advanced frequency modulation synthesis techniques he had developed using the Samson Box. Microtonal scales lend emotional tension and a steely strangeness.

Common compositional elements that show up in many CCRMA works of that era (and that are also present here) include the atmospheric projection of sound in vast spaces, a pristine sonic background, sharply defined but otherworldly musical shapes, and non-rhetorical musical semantics. These characteristics perfectly complement stereoscopic vistas of the remote Martian surface.

The 3-D Blu-ray disc also contains a video interview with the principals:

Chowning, McNabb, Schottstaedt, and Uri Geva, a colleague of Levinthal's, and also a member of the Viking imaging team. There are bonus tracks containing only the music. As if that were not generous enough, there are extra music files on the ROM section of the disc, including a special version of the 5.1 "stage" mix that is specifically intended for headphone playback. Formats available include stereo FLAC, MP3, and 48 kHz/24-bit PCM audio. A Blu-ray ROM drive connected to a computer is required to access these extra files. Although the disc plays normally on any 2-D Blu-ray player, viewers must have a 3-D Television

or 3-D Projector, a 3-D Blu-ray player, and 3-D glasses appropriate for that system to experience the movie in 3D.

A copy of the restored *Mars in 3D* movie can also be viewed on the Internet at <http://youtu.be/ubRHSg5daMs> using anaglyph glasses, 3-D video players, or 2-D computer screens and televisions.

It is a shame that Levinthal did not live to see his film reborn. He died 14 January 2012. The opening credits dedicate the movie to his memory. McNabb and Schottstaedt's loving revival of *Mars in 3D* is a worthy testament to Levinthal's remarkable and lengthy list of accomplishments.

Mars is certainly a different place than it was in the 1970s: Now there are teams of people whose day job is to guide vehicles such as the rover Curiosity over its dusty surface. Perhaps someday women and men will stand on Mars, witnessing with their own eyes what we can currently only glimpse on screen. But even then these stark Martian landscapes will still fascinate. Restored to perfection beyond their original condition, these historic first stereoscopic images of the surface of Mars, and the music that brings them to life, capture the experience of humankind's first immersive encounter with another planet.