

Ray Tracers: Blue Sky Studios

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 David Brown. Photo by SAWhite.

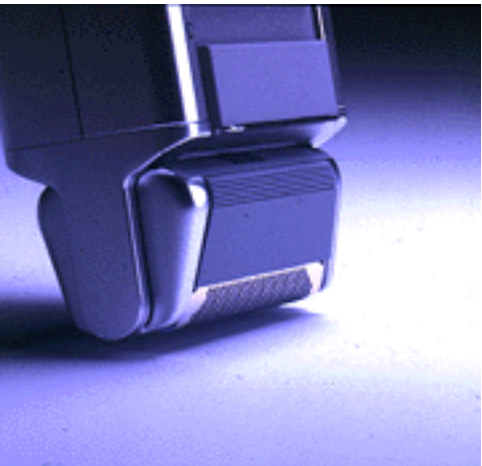
 Dr. Eugene Troubetskoy. Photo by SAWhite.

The essence of computer animation is making something that is fabricated look real. Artists and technicians in this field devote a considerable amount of time to analyzing which elements give objects and people their realistic appearance. Textures, movements, shading, and sound all have to be carefully designed to create convincing replicas. In the opinion of the executives and animators at Blue Sky Studios in Harrison, New York, light rays are the most important element for creating believable computer images. Their numerous commercials and recent feature film work demonstrate convincingly that understanding how light affects objects is essential to creating quality computer graphics.

Blue Sky Studios, Inc. was founded in February 1987 by a group of people who had met at MAGI/SynthaVision while they were working on Disney's *TRON*. Each brought a range of talents and experience that proved valuable in dealing with the emerging business of computer animation. David Brown, the company's current President and CEO, had been a marketing executive with CBS/Fox Video. Alison Brown (no relation), now Vice President of Marketing and Sales, came from advertising and special effects. The company's creative director, Chris Wedge, was an animation artist and teacher. The most unusual member of the group, and the man responsible for the distinctive look of its films, is Eugene Troubetzky, who holds a Ph.D. in theoretical physics from Columbia University. He and former NASA engineer Carl Ludwig developed the proprietary software and renderer that give Blue Sky its competitive edge.

The Physics of Animation

Troubetzky's approach to animation grew out of his earlier work in nuclear physics. Just as physicists study the way beams of electrons and photons bounce off other subatomic particles, Troubetzky analyzed how light rays interact with everyday objects. He and Ludwig studied how objects appear in a variety of lighting conditions, from bright to shaded, under clouds or under water, and looked at how they reflect or refract light rays. Using complex algorithms and over 50,000 lines of computer code, they wrote software that mimics these conditions in the computer.



Blue Sky's trademark software CGI Studio also defines the material properties of an object--its density, transparency, and degree of reflectivity--and how these will be affected under different light conditions. When the company is working on a computer graphics project, technicians shoot a reference object, often a small white sphere, within the light environment that will be seen in the film, to study its illumination. Blue Sky's research team combines this information about light conditions with data on the material properties of the object to replicate how its surface would look under those conditions. The company's patented renderer, under the supervision of Carl Ludwig, then models that surface texture onto the animated object, in a process called ray tracing.

The result of the ray tracing process is high quality photorealism that even fools professionals. In a recent contest for computer animation, judges rejected a commercial that Blue Sky had produced for Braun's electric shaver, because they believed it had been shot on film. The surface texture of the metal object is so convincing, and the movements it makes so smooth, that it's easy to see how they were deceived.

In addition to the Braun commercial, Blue Sky has used its proprietary software to create over 200 spots for other clients, including Chrysler, M&M's/Mars, General Foods, Texaco, and the U.S. Marines. Last Christmas the company produced a holiday commercial in which three ornaments rappelled off a Christmas tree to drink a can of Pepsi that had been left for Santa. This story of toys staging a heist is reminiscent of the birthday party scene in Pixar's Toy Story, and in fact the spot originated at Pixar, before the studio announced it would stop making commercials and concentrate on feature films. Pixar recommended Blue Sky for the assignment--solid confirmation of the studio's

prestige within the industry.



Chock Full O'Nuts' talking coffee bean.

Blue Sky commercials are also distinguished by the believable personalities they develop for inert objects. Two spots that illustrate this accomplishment were created for Chock Full O' Nuts coffee and Bell Atlantic. The ad for Chock Full O' Nuts features a coffee bean which is animated so that the crease in its side looks like a mouth. The talking bean, who speaks with a distinctive Texas drawl, lavishes compliments on his hostess for serving what sounds like an outrageous combination of foods: artichoke hearts in hot fudge sauce, butterscotch pepperoni soufflé, and brownies filled with garlic. The bean's flattery vividly illustrates the point that this coffee is so smooth it can "complement" any meal.

In the Bell Atlantic commercial *The Big Deal*, the main character is a telephone cord whose plastic connector becomes an anthropomorphic head. The cord, nicknamed "Jack" by animation director Carlos Saldanha, takes on a childlike personality as it acts out the various services the phone company offers, tapping its "foot" to illustrate Call Waiting, and splitting into a three-pronged wire to demonstrate Three-Way Calling. Its engaging personality and energetic responses demonstrate Blue Sky's desire to cut through the flood of commercials that bombard us and create a memorable impression. "Not all inanimate objects become characters." Alison Brown comments, "What gives them personality is their ability to awaken our emotions."

Several Blue Sky executives who worked in advertising in the 1980s have drawn on their industry contacts to build new business, and the company also has two reps working with agencies on the East and West coasts. Scripts and storyboards for commercial spots usually originate with the agencies, because their clients have to approve the concept. Since advertisers thoroughly research the demographics for a product, they know what kind of audience they want to reach, and often choose animation for products that appeal to younger, more hip viewers. For example,

Blue Sky created the promos for the Nickelodeon channel, in which a mound of orange glop takes on various shapes before emerging as the cable channel's distinctive "Nick Boy." The creative, offbeat use of animation in these spots is in sync with the type of viewers who watch Nickelodeon.

Advertising agencies vary in their willingness to use computer animation. Though some, like BBDO Worldwide, who commissioned the Pepsi commercials, appreciate the fact that computer animation can make the impossible possible, others prefer to continue working with traditional filmed spots and stop motion or puppet animation. At times, Blue Sky produces test footage on spec, to convince clients of the value of its approach. A recent sequence for Hershey's Kisses showed how the foil-covered chocolates could take on believable personalities. However, as the popularity of computer animation increases, and it appears more frequently in Hollywood films, Blue Sky is finding a growing demand for its talents.

Hollywood's Calling

In addition to its commercial work, Blue Sky has begun producing animated sequences for feature films, a line of work which it plans to expand. The studio's most famous accomplishment in this area is the animated cockroaches it created for Warner Bros.' feature-length version of the MTV short *Joe's Apartment*. The film, released last summer, stars a twenty-something resident of a dilapidated apartment in New York's East Village who shares his living quarters with roaches---thousands and thousands of roaches. The production used 3,500 live insects as well as rubber puppet and stop-motion replicas. Blue Sky's contribution to the film consists of 13 minutes of computer animation, in which the insects do things that would have been too difficult to portray with puppets or stop motion. To achieve a realistic appearance for the creatures, supervising animator Carlos Saldanha studied the texture and motions of live roaches to get a shiny, wet look and to make the movements of their legs and antennae seem natural. The most memorable sequence in the film, however, has nothing to do with realism. In the musical number "Funky Towel," roaches rap dance on a bar of soap, waltz around the rim of a toilet, and perform a water ballet right out of Busby Berkeley. Some scenes in the film even mix live roaches with their computer-generated counterparts. Thanks to Blue Sky's careful rendering, they're hard to tell apart--until the computer insects start to sing. "Funky Towel" has won numerous awards from festivals in Spain, Canada, England and most recently, Monaco. To promote its feature film work, Blue Sky President and CEO David Brown meets often with studio executives in Hollywood, and the company has recently hired several people with substantial experience in film production. Director/designer Jan Carlee joined Blue Sky after serving as Director of Digital Imagery and Computer Animation at Don Bluth's animation studio in Ireland. Amy Jupiter, Executive Producer and Vice President of Production, worked on special effects for Apollo 13 and was responsible for production activities on special films for Disney theme parks in Florida, Paris, and Japan. Blue Sky has also recently hired Henry Anderson, who animated the Coca-Cola "Polar Bears" and worked at Digital Domain and Rhythm & Hues.The studio's current projects include computer graphics sequences for Twentieth Century Fox's *Alien: Resurrection* and for the Bubble Factory/Universal project *A Simple Wish*, both slated for release later this year.

Alison Brown feels that working on both commercials and features gives the animators the "opportunity for a breather." If they tire of working on the character in a feature sequence, they can switch over to a shorter commercial project for change of pace. A recent tour of Blue Sky's spacious facilities revealed a work space that is carefully designed to allow both creative concentration and friendly interaction. Offices are separated by dividers that are high enough to provide privacy when animators want to focus on their computer screens, but low enough so that when they stand, they can talk comfortably with colleagues. Many animators have lined their offices with wind-up toys and merchandise from *Star Wars* and other special effects films. The 30,000 square foot building also houses communal meeting spaces with couches and chairs, and a glass-enclosed kitchen and dining room. Animators use Silicon Graphic workstations, and there are digital editing suites and a studio where they can project footage for critiques. 1997 marks the ten year anniversary of Blue Sky Studios' founding.The company now employs 85 people, and continues to expand as the demand for high end computer animation increases. *Susan Ohmer, Ph.D. teaches courses on new technologies in the Graduate Media Studies Program of the New School for Social Research in New York City.She can be reached at susohm@aol.com.*



The Pepsi Christmas Tree spot.



Alison Brown. Photo by SA White.