

Rockefeller Foundation New Media Fellowships
2003 Project Cover Form

SHAWN BRIXEY

Title: "Eon"

Genre: Interactive Installation

Applicant's Role in Production: Primary Investigator/Artistic Director

Production Format: Hybrid Interactive Networked Telepresence Installation

Anticipated Length: Standard Museum Exhibition/Tour

Color/B&W: N/A

Sound/Silent: N/A

Brief Project Description: (do not exceed space given below)

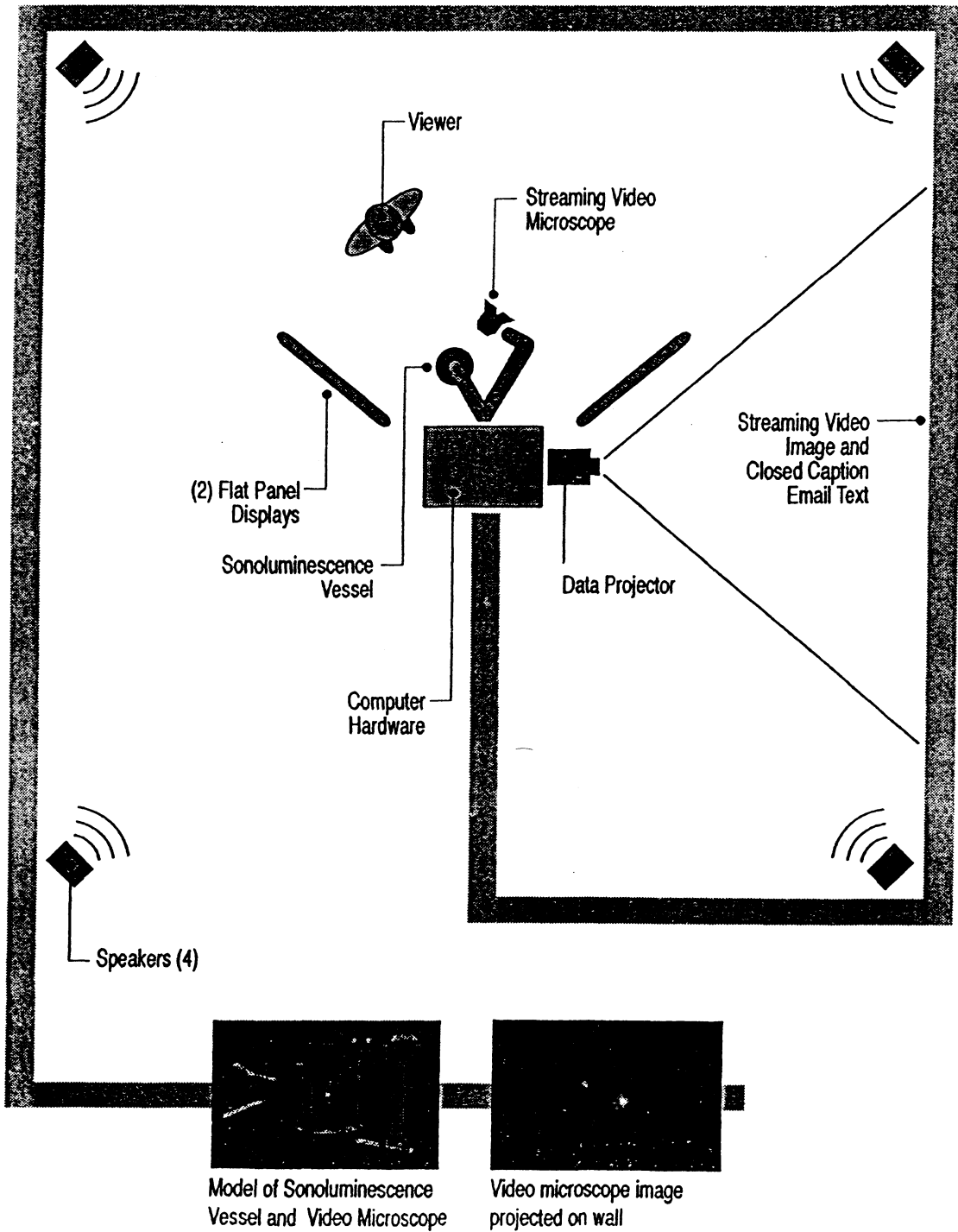
Abstract

"Eon" is a new work in progress that uses the rare phenomenon of sonoluminescence (the process by which intense sound energy in liquid can be converted directly into visible light) and the Internet to extend my current artistic research in the fields of telepresence, telepistemology and emulation. Eon's design allows both museum and telepresent (distant) visitors from the Internet to send short poetic e-mails in different languages to the museum's exhibition site and have them instantly converted into text encoded ultrasound. This high energy/high frequency sound source in turn amplitude modulates a small cylindrical vessel of ultrapure water, and through a unique and unexplainable process creates a tiny brilliant "star-like" sonoluminescent light source floating at its center. As visitors actively create this enigmatic light source with their encoded e-mail messages, a live digital video microscopy system displays the phenomena locally via high-resolution data projection in the exhibition space, as well as simultaneously streaming it to the web. Museum visitors wear specially designed light sensitive headphones that allow them to move close and listen directly to the sound emitted from the tiny light source, as well as listen to the hundreds of voices of net based visitors around the world emitted from the light. Net visitors can watch streaming video of the tiny light source as well actively create it through their e-mail. They can also hear live e-mail that is being decoded from the remarkable light source in the museum. The inexplicability of this rare phenomenon (sonoluminescence by current physical theory cannot be fully explained) is carefully combined in Eon with much of the disbelief we harbor concerning the power of simulation technologies. Eon amplifies lingering questions on the nature of belief, beauty and the fidelity of digital experience, and asks whether the phenomena at the core of the project is more believable than the sophisticated digital media technology used to create and sustain it.

Rockefeller Foundation New Media Fellowships
2003 Project Installation Diagram "Eon"

SHAWN BRIXEY

Installation Diagram: (not to scale)



2003 Project Sample Play List

SHAWN BRIXEY

Shawn
only

Sample Materials Play List: Running Time 15:00 minutes

EON

Computer Animation of Proposed Fellowship Project (silent) 00:01:00
Animation and Modeling, Steven Toh and Shawn Brixey, 2002

CHIMERA OBSCURA

Excerpts from PBS Television Program, "Secrets of the Sequence"
Time-lapse Footage of Project Installation (seven day)
Interview Excerpt from PBS Television Program, "Secrets of the Sequence"
Video Production, Cronkite Television and Shawn Brixey, 2002 00:06:45

LIQUIESCENCE

Excerpts from PBS Television Program, "SpringBoard"
Time-lapse Footage of American Design Triennial Project Installation
Excerpts from Project Documentary
Video Production, KQED Television San Francisco and Shawn Brixey, 2001 00:07:15

Run Time Total: 00:15:00

Supplemental Play List: Running Time 07:00 minutes

SECRET AGENTS

Excerpts from Arizona State University, Institute for Studies in the Arts
Secret Agents e-Opera Project Documentary
Video Production, Brett Simon and Shawn Brixey, 2001 00:05:00

Supplemental URL: Running Time (open)

RESEARCH WEBSITE

www.dxarts.washington.edu/shawnx

Website includes Selected Curriculum Vitae, Narrative Biography, Artist Statement, and Project Descriptions since 1986. Projects have detailed information, short video and audio clips and numerous illustrations.

To view, open web browser window. Click, the "enter" button, then scroll to "recent project's" button, click and scroll through any of the projects for more detailed information on my work or images.

WIP

Rockefeller Foundation New Media Fellowships
2003 Sample Work Form Number 1

SHAWN BRIXEY

If you are sending more than one sample, please copy this page. Sample(s) must be cued: indicate how long each sample should be viewed for a COMBINED viewing time of no more than 15 minutes. If slides are included in this application, please list the title and year of the work on this form.

Title: "Eon", Rockefeller Fellowship Proposed Project (telepresence installation) - video playtime 00:01:00 (silent)

Year: 2002-2003, in progress

Applicant's Role in Production: Primary Investigator/Artistic Director

Technical Info

Original Format

- Software
- Web
- Installation
- Other Telepresence Installation

Format Submitted for Viewing

- Software
- Web
- Installation
- Other Single Channel NTSC/DVD/VIDEO

Preferred OS

- Windows
- Mac
- Unix

Web Info (answer only if sample work is in Web format)

- URL (if more than one please list them below) similar information is available at the URL listed below
- Browser requirement NMS or above IE 5 or above
- Plug-in requirement Standard Quicktime Plug-in's
- This sample requires broadband connection (fast Internet Connection)
- A local copy of the sample work has been included with the application

Special Information For Viewing:

Description of Work (use an additional sheet if necessary)

The viewing sample is a single channel (silent) NTSC video of computer generated models of the hardware, transducers, water vessel with simulated sonoluminescence and mechanical mounting systems designed for the proposed Rockefeller Fellowship project. The video is created from the actual CAD fabrication files, which will be used in the final machine construction of the exhibition components. The video provides close-up and long-shot views to closely simulate what a portion of the project hardware and phenomena will look like to isitors when construction is completed.

Further description is available in the Project Cover Form and Proposal, or online at <http://www.dxarts.washington.edu/shawnx/shawn/art.page.eon.html>.

Museum Installation Size: 25'x 25' (networked)

Rockefeller Foundation New Media Fellowships
2003 Sample Work Form Number 2

SHAWN BRIXEY

If you are sending more than one sample, please copy this page. Sample(s) must be cued: indicate how long each sample should be viewed for a COMBINED viewing time of no more than 15 minutes. If slides are included in this application, please list the title and year of the work on this form.

Title: "Chimera Obscura" (telerobotic installation) - video playtime 00:06:45

Year: 2002

Applicant's Role in Production: Original Commissioned Artist/Artistic Director/Mechatronic Design

Technical Info

Original Format

- Software
- Web
- Installation
- Other Telerobotic Installation

Format Submitted for Viewing

- Software
- Web
- Installation
- Other Single Channel NTSC/DVD/YVIDEO

Preferred OS

- Windows
- Mac
- Unix

Web Info (answer only if sample work is in Web format)

- URL (if more than one please list them below) similar information is available at the URL listed below
- Browser requirement _____
- Plug-in requirement _____
- This sample requires broadband connection (fast Internet Connection)
- A local copy of the sample work has been included with the application

Special Information For Viewing:

Description of Work (use an additional sheet if necessary)

The viewing sample is a single channel NTSC video containing excerpts from the PBS Television program, "Secrets of the Sequence", as well as installation, exhibition and PBS interview footage from "Chimera Obscura". The project was created by new media artists Shawn Brixey and Richard Kinehart, and is an interactive telerobotic installation commissioned by the Henry Art Gallery especially for the premiere of the traveling Gene(sis) – Contemporary Arts Explores Human Genomics exhibition. The artwork occupies two spaces simultaneously - the museum and the Internet. Net users navigate an infinitely complex informational "maze" after logging onto the Chimera Obscura website. This on-line navigational activity triggers the physical motion of the telerobotic installation located in the gallery. The installation includes a live networked controllable web camera, a large-scale maze generated from a human thumbprint, and a three-dimensional telerobotic space plotter which charts the maze with the camera. Sequencing the human genome and understanding what the expression of gene organization means biologically requires developing a system for understanding how bits of information accumulate, relate to, and influence each other.

Chimera Obscura offers visitors the opportunity to participate in a dynamic and evolving model of such an information system. The distributed nature of this artwork represents the artists' understanding of the meta-level process of mapping the human genome and other discoveries arising from the collaborative spirit and competitive activity it encompasses. Mapping, in many ways, is analogous to navigating a maze. The virtual maze of Chimera Obscura is navigated by online participants who leave trails of "memes" (media files of any type, i.e. video, audio, text, graphic) behind for others to read, duplicate or delete in the search for the unique sequence that will decode the maze. The web camera becomes the online visitors eyes and the robotic plotter becomes their legs as they navigate the physical space of the thumbprint in the gallery from the web. The browser and richly populated database of meme's (that are virtually mapped on the maze) becomes both the history of the process and the social organism that evolves directly from the activity that creates the project.

Further project and exhibition information is available online at <http://chimera.berkeley.edu> or http://www.gene-sis.net/new_works.html

Installation Size: 27'x 21' (networked)

Corporate Sponsors Included, Applied Robotics, NuSPECTRA, Digital Signage, FlashCut CNC.

Rockefeller Foundation New Media Fellowships
2003 Sample Work Form Number 3

SHAWN BRIXEY

If you are sending more than one sample, please copy this page. Sample(s) must be cued: indicate how long each sample should be viewed for a COMBINED viewing time of no more than 15 minutes. If slides are included in this application, please list the title and year of the work on this form.

Title: "Liquescence" (electronic architectural installation) - video playtime 00:07:15

Year: 2000

Applicant's Role in Production: Commissioned Artist/Digital Video/DVD and Computer Controlled Projections

Technical Info

Original Format

- Software
- Web
- Installation
- Other Video/Architecture

Format Submitted for Viewing

- Software
- Web
- Installation
- Other Single Channel NTSC/DVD/VIDEO

Preferred OS

- Windows
- Mac
- Unix

Web Info (answer only if sample work is in Web format)

- URL (if more than one please list them below) similar information is available at the URL listed below
- Browser requirement _____
- Plug-in requirement _____
- This sample requires broadband connection (fast Internet Connection)
- A local copy of the sample work has been included with the application

Special Information For Viewing:

Description of Work (use an additional sheet if necessary)

The viewing sample is a single channel NTSC video of the project "Liquescence", which was commissioned by the Cooper - Hewitt National Design Museum, New York, for the first American Design Triennial. The only exhibition of its kind in the United States, the first Triennial presented a critical review of leading developments and emerging figures - shaping current discourses in American architecture, media and design.

Designed and executed in collaboration with "LOOM Studio" (Raveevarn Choksombatchai, Ralph Nelson) and media artist Shawn Brixey, "Liquescence" was the only commissioned work for the national exhibition. Liquescence was a site specific installation using both architectural and digital media elements to suggest a spatial and temporal experience which is in a constant state of "becoming". Neither solid nor liquid, the project evokes rhythm, motion and perpetual transfiguration in an indeterminate zone

between light and shadow, time and space, figure and field. "Liquescence" made evident these investigations through three temporal constructions which coalesced environmental, digital and biological information into new meaning.

The installation was designed to take advantage of the unique exterior light well of the museums 19th century atrium and courtyard. Strategically situated in the transitional space between two thematic areas of the exhibition entitled "Physical" and the "Fluid", Liquescence fused both concepts together forming an experiential bridge from one part of the museum to another, and from one field of thought to another.

The physical installation consists of three large computer designed aerospace aluminum frames skinned with translucent poly-lycra fabric. These forms are attached to the outside of the museums ornate facade, and specially designed fasteners, bracing and nylon cord allow for the fabric to be molded into elaborate organic shapes without damaging the historical structure. These three architectural elements are combined with digital video projections and attenuated natural light to create three shimmering autonomic spaces that correspond to the atriums three windows looking onto museum first floor courtyard. The digital video projections character and phrasing was created by a series of specially recorded underwater video sequences. The motion and timing of the video was modified using specially designed real-time video software to re-map the natural ebb and flow of light patterns on the water to follow new patterns of human respiration, heart rate and muscular contraction. Choreographing the biological rhythms into the architecture of time in the video sequences allowed for the digital and architectural elements of Liquescence to merge into a seamless experience for museum visitors in the surrounding space. The video shows the installation site, the construction and installation process, the framing and fasteners, and includes interior (museum visitor) views of the light courtyard with multiple video projections and daylight mixing on the Northern, Southern and Southeastern structures. The project ran 24 hours a day for nine months.

Installation Size: 25'x 45'x 65'

Corporate Sponsors Included, Moss Inc. and the Boxlight Corporation

Rockefeller Foundation New Media Fellowships
2003 Supplemental Work Form Number 1

SHAWN BRIXEY

If you are sending more than one sample, please copy this page. Sample(s) must be cued: indicate how long each sample should be viewed for a COMBINED viewing time of no more than 15 minutes. If slides are included in this application, please list the title and year of the work on this form.

Title: "Secret Agents" (networked opera) - video playtime 00:07:15

Year: 2001

Applicant's Role in Production: Original Commissioned Artist/Wireless Digital Video System Design/Hybrid Cellular System Design/Project Managing

Technical Info

Original Format

- Software
- Web
- Installation
- Other Video/Networked Opera

Format Submitted for Viewing

- Software
- Web
- Installation
- Other Single Channel NTSC/DVD/VIDEO

Preferred OS

- Windows
- Mac
- Unix

Web Info (answer only if sample work is in Web format)

- URL (if more than one please list them below) similar information is available at the URL listed below
- Browser requirement _____
- Plug-in requirement _____
- This sample requires broadband connection (fast Internet Connection)
- A local copy of the sample work has been included with the application

Special Information For Viewing:

Description of Work (use an additional sheet if necessary)

"Secret Agents" was a collaborative commissioned networked-opera initiated by Shawn Brixey and included collaborating artists Sheldon Brown, Louis Hock, Lynn Hershman, Robert Nidiffer, Victoria Yesna, Fabian Wagemister and Robert Winter from the UC system. Created for Arizona State University's, Institute for Studies in the Arts as a part of the "Digital Secrets Conference" 2000, the project was concerned with the creation of a cyborgic virtual being, an "agent" who represented and reflected the consciousness and consensus of the University of California Digital Arts Research Networks' collaborative team. The project was a remotely inhabited and site specific net-based performance that used a distributed personae (actor Karen Black) to investigate and play out notions of agents and agency, presence and absence, identity and identification. Using both telepresent and robotic applications, this semi-autonomous human interface (actor Karen Black) acted on behalf of the group reflecting the collective ideas and intelligence of UCARNet. The agent was both metaphoric and actual: a virtually embodiment of our collaborative thought

and a physical presence at the conference who's internal processes and external actions were guided by remotely located UCDARNet members, and streamed live over the Internet. The living agent engaged with conference participants and discoursed in all the areas of digital art and emerging technology encompassed by our more "secret" agents, the UCDARNet collaborators who were geographically distributed over California and Arizona, yet simultaneously telepresent and re-mapped in real-time onboard the host agent.

Using a sophisticated array of modified wireless video and cellular technologies, nine UCDARNet project collaborators carried on a covert three day live video-conference with the actor Karen Black acting as our collective "secret agent". The real-time connection with both project collaborators and the field operative allowed for a single entity (agent) to form at the conference site among the distributed participants. The live video and audio streams that the UC DARNet members responded to, were recorded and edited during the event to form the nucleus for a networked-opera which was performed as the closing ceremony of the international conference. The e-opera carefully disclosed to the conference attendees their unknown role in a much larger network of ongoing distributed collaborations by the UCDARNet collaborators.

The supplemental single channel video is an excerpt from a 20 minute documentary that shows preparation of the video, electronic and networking systems for the agent, and includes covert video footage of actor Karen Black, the "secret agent" simultaneously interviewing conference attendees, and video-conferencing live with UCDARNet project collaborators from a remote locations via a modified video-conferencing systems at the Digital Secrets Conference at Arizona State University.

Video also includes short rehearsal excerpts from the performance of "Secret Agents", a networked-opera for the Digital Secrets Conference at Arizona State University, November 2000.

<http://www.dxarts.washington.edu/shawnx/shawn/art.page.secret.html>

Rockefeller Foundation New Media Fellowships
2003 Supplemental Work Form Number 2

SHAWN BRIXEY

If you are sending more than one sample, please copy this page. Sample(s) must be cued: indicate how long each sample should be viewed for a COMBINED viewing time of no more than 15 minutes. If slides are included in this application, please list the title and year of the work on this form.

Title: "Research Website" (on-line materials, cv, bio, artist statement, bibliography, research projects, etc.)

Year: 1986-2002

Technical Info

Original Format

- Software
 Web
 Installation
 Other Hybrid Installations

Format Submitted for Viewing

- Software
 Web www.dxarts.washington.edu/shawnx
 Installation
 Other

Preferred OS

- Windows
 Mac
 Unix

Web Info (answer only if sample work is in Web format)

- URL (if more than one please list them below) similar information is available at the URL listed below
 Browser requirement NNS or above IE 5 or above
 Plug-in requirement Standard Quicktime Plug-in's
 This sample requires broadband connection (fast Internet Connection)
 A local copy of the sample work has been included with the application

Special Information For Viewing:

Description of Work (use an additional sheet if necessary)

URL: www.dxarts.washington.edu/shawnx includes Selected Curriculum Vitae, Narrative Biography, Artist Statement, and Project Descriptions since 1986. Projects have detailed information, short video and audio clips and numerous illustrations.

To view, open web browser window. Click, the "enter" button, then scroll to "recent project's" button, click and scroll through any of the projects for more detailed information on my work or images.

Rockefeller Foundation New Media Fellowships
2003 Artist Statement

SHAWN BRIXEY

Artist Statement:

As an artist I am committed to the invention, exploration and development of truly new and experimental art forms. My research focuses on an interdisciplinary synthesis of emerging digital media technology with the physical and biological sciences. I am specifically interested in the recording and transformation of artistic impulses and poetic experience through materials, tools and thought processes often considered completely outside of the domain of the arts. My artwork attempts to soulfully address the impact of advanced technology on artistic expression, and the creative landscape it is dramatically altering. Traditional artistic sensibilities play a critical role in the initial creation of my work, yet they do not always easily import to these new environments, and often must be redefined in light of new methods and meaning. The delicate balance of unorthodox use and precise invention of new technologies is central to the creation of my work. This non-traditional approach has so greatly impacted the ability to address and extend my research that I have begun to project what I describe as a new kind of poetic interaction into the actual mechanics of the microscopic and macroscopic realms. These new art works function as a type of "material poetry", art made explicitly from the expressive interaction of discreet forms of matter and energy. Made neither through traditional reductive or additive art process, these new works are true hybrids. They are novel art forms that are often taught how to build themselves, or are interactive works that are encoded and programmed at the fundamental level of organization (quantum, atomic, molecular, genetic) with a type of independent or telematic goal of their own. As both new forms of artistic expression and technology, my artwork helps define a critical evolutionary step in the transformation of media art by synthesizing it with the body's of knowledge from the sciences and engineering, and provides compelling and clear examples of important new strategies for future artistic expression.

2003 Project Narrative (Eon)

SHAWN BRIXEY

Proposed Research Project

Background: The basic research for Eon was initially begun at the University of California Berkeley in 2000, and the project was the recipient of the 2001 Hellman Award for Distinction in Research from the Office the President. Normally reserved for outstanding research in the sciences, this particular Hellman Award was the first ever to be given in the Arts on campus. More importantly the award recognized that in Eon the potential for both innovative science and advanced exploration in the arts could exist not only side by side in the same research, but could be completely intertwined, complimentary, and the art and science ultimately indistinguishable from one another. The award provided \$21,000.00 in crucial start-up funding for the initial research, design, and prototype testing of the project, and sets the stage for this proposed exhibition and the Rockefeller Foundation New Media Fellowship.

Eon further extends my body of research into radical new media arts territories based on previous successful projects that I have developed. Early projects such as my 1987 NEA sponsored work "Photon Voice", where I used the radiation pressure of light (kinetic momentum of photons) to build my own gravitational system. The light source developed for the project was computer encoded with my voice, and was used to levitate in a vacuum, tiny galaxies of graphite particles that had originally fallen from the tips of pencils that were used to make the actual mechanical drawings for the project, and from the critical writings I had made about the project as well. Photon Voice foreshadowed much of the current media arts research interest in auto-poiesis and self-creating art forms by more than a decade. "Alchymeia" advanced my research in both auto-poiesis, and telepresence through an Internet based biotechnology installation designed for the 1998 Winter Olympics in Nagano, Japan. In Alchymeia I harvested metabolite steroids from the blood and urine of Olympic athletes to act as nucleating agents (information blueprints or building blocks) to precisely guide the growth of snowflakes in ultrapure water. Human presence was physically embodied in the snowflakes hidden atomic architecture, and in the dramatic alterations of its familiar and almost sacred form. Alchymeia was a physical re-mapping of the contemporary social critique surrounding the post human body, and a web-based interactive installation on the shifting boundaries between the public and private, perfect and imperfect, sacred and profane in the emerging era of genetic research. In 2002 the telerobotic project, "Chimera Obscura" commissioned for the world premiere of Genesis – Contemporary Art Explores Human Genomics at the Henry Art Gallery, University of Washington, examined the issues of genomics research through the active creation of a database driven social organism. The artwork was created by the use of a telerobot, in which online navigation sequenced an elaborate maze that stored and expressed "memes" or information gene's, which were left in the project database by visitors. Chimera Obscura is further detailed in my video work sample materials.

Artistic Impulse: Eon's inspiration could best be understood as the continuing drive to synthesize the frontiers of digital media technology and the physical sciences, with my desire to create a higher level of implementation in these new kinds of hybrid art forms. This higher level of digital creation could be called "Emulation Art". The idea of art as emulation emerges from the growing disenchantment with screen based simulation technology, and the desire to build technology based art works that have increasing levels of autonomy, unmediated connection and operate with more sophisticated self organizing principles. While these new works - of which Eon is the first practical example - are descendants of the "material poetry" projects I have built over the past decade, these art works were made from the earliest attempts to work at the level of expressive interaction in discreet forms of matter and energy. The new works are very different as they are set in motion, or more accurately, programmed at the root level of organization (i.e. quantum, atomic, molecular, genetic), and precisely at the junctions where - it could be argued - they reside in the actual fabric (or operating system) of the universe. Though this language may partially mystify the research work, it is not intended to. As technology increasingly influences the way we imagine and define ourselves, the way we reach out to learn, know and create is also dramatically changing. As this occurs, the very fabric of our expressive landscape also changes with it, so much so that I believe we are clearly poised to inherit a nearly infinite continuum of scales, places and contexts in the universe in which to express ourselves. Much of my career as an artist has been spent exploring this emerging nexus. Employing nature and advanced technology, the Eon project allows exhibition visitors to begin authoring their own ideas inside an enigmatical part of universe, one with quite possibly cosmic implications.

Project: Eon uses the Internet and the rare phenomenon of 'sonoluminescence' to artistically explore some of the crucial concepts emerging in contemporary media arts research. These include telepresence, telepistemology, and emulation. Telepresence could be loosely defined as the "experience" of being present in a real physical location remote from one's true physical location, Telepistemology - essentially the various ways in which we know, construct and trust a seemingly intimate experience - such as a long distance telephone call - that is completely mediated by technology. Emulation is easily distinct from simulation in that an emulation is completely indistinguishable from the thing itself, i.e. "it is real". A digital simulation of a "snowflake" for example, is some form of screen based illusion synthesizing five separate things; an interface, a program, a processor, a storage device, and a display. An emulation of a snowflake - is an actual "snowflake"! A snowflake is an interface, a program, a processor, a storage device and a display, all inextricably bound up in a real thing. The issue being both the current practical limitations of creating expressive emulations and the poetic dimension man made emulations might provide to the evolving field of media arts research.

Discovered nearly eighty years ago, sonoluminescence is the inexplicable process of where sound in a number of liquids can be converted directly into light. In Eon, sound energy in the form of a beam of ultrasonic waves is focused on a microscopic air bubble in a small body of degassed ultrapure water. The intense, but inaudible sound causes a rapidly fluctuating bubble to form, and hover trapped in an almost collapsed state, setting off a series of events that remarkably cause the bubble to emit and sustain a brilliant pinpoint of light visible to the unaided eye. Novel electronics I have designed for Eon allow for a signal to be encoded directly into this enigmatic light source by telepresent visitors from all over the world via the Internet. A computer with

automatic text-to-speech software allows net-based authors to write short poetic e-mail in English, German, French, Italian, Spanish and Japanese, and have them converted directly into amplitude modulated ultrasound. This high frequency sound encodes their text as spoken word and subsequently generates the exhibition's sonoluminescent light source. The modulated sound energy from the encoded text acts much the way an AM radio station does. The slight increase and decrease of the ultrasound intensity makes the light source rapidly grow brighter and darker, and this light signal in turn is converted with miniature photo-electronics into electricity and then amplified into audible sound. Museum visitors miraculously see this tiny light floating in an enclosed glass reservoir of water in the exhibition space. The water vessel is connected only by a thin umbilical cord, which is attached to its attendant electronic life support equipment and Internet servers. Exhibition visitors can wear specially designed light sensitive headphones that allow them to move closer and listen directly to the pin point of light, as well as hear the ocean of other voices from the net based visitors that wash over them. Similar to an astronomical observatory, digital video microscopy equipment is zoomed in on the "starlike" light source, magnifying and projecting it in real time on a gallery wall via a high output data projector. Net visitors in turn easily log-on and watch streaming video of the perplexing light source as well as create it directly with their text, and hear the e-mail poetry from around the world that is being decoded from it.

The fact that sonoluminescence is fairly easy to achieve, yet cannot be completely explained, generates instant and instinctual curiosity in any viewer. Both its complexity and simplicity are consistent with the conceptual foundations of my work. Not only does sonoluminescence completely contradict common sense, but the even the sono-physics and chemistry is daunting. For example, the spectrum of light from the bubble implies that the source of the radiation is similar to a blackbody object at a temperature of tens of thousands of Kelvin's (that would be impossible as it is much hotter than the surface of the sun). Theorists also have tried in vain to successfully explain sonoluminescence, but the complete mechanism behind the production of the light is hotly debated and still remains a mystery. One theory, for example, states that the radiation comes from plasma formed by the collapse of the bubble, or from energized argon in the water. Another theory offers an even more daring explanation. The theory speculates the "vacuum" surrounding the bubble is emitting the visible light. Modern quantum theory holds that invisible virtual photons abound in the vacuum. The behavior of these "zero point fluctuations" is influenced by the properties of the surrounding medium. The rapidly moving air/water interface of the bubble (where two media of different indices of refraction come together) in sonoluminescence may facilitate the conversion of virtual photons into real photons. In fact, in this theory, sonoluminescence may represent the first observable manifestation of quantum vacuum radiation (light emitted from deep inside the fabric of the universe).

The inexplicability of this rare phenomenon is simultaneously combined in Eon with much of the disbelief we harbor concerning the power of simulation technologies, the questions we have about ubiquity of communication technology, and the limitless boundary of data the Internet symbolizes. The project taunts the viewer with a simple glass of water, and routine e-mail, yet provokes unbelievable aspects of both nature and technology, and amplifies lingering questions on the nature of belief, beauty, and the fidelity of digital experience. It asks whether the natural phenomena at the core of the project are as believable as the sophisticated digital media technology and scientific tools used to create and sustain it, or is seeing unbelieving.

Installation Hardware: Eon is elegantly simple and physically very small. The exhibition hardware is comprised of a small stainless steel and brass cylindrical apparatus that holds two high energy ultrasonic transducers, and a enclosed glass reservoir of water where sonoluminescence occurs (approximately 10" x 12" x 20" inches). Beneath this structure is a rack of specialized electronic hardware and software specifically invented for the project. This equipment supports both the automatic starting, continuous monitoring and adjusting of Eon's sonoluminescent bubble. The electronics rack further includes the real-time video streaming server and e-mail-to-speech server (approximately 24" x 20" x 32" inches). Eon requires four separate high speed Ethernet connections with individual IP addresses, running on a minimum backbone of 10-base T. The video and audio server use the majority of bandwidth, while the rest is used by on-site and off-site computers that monitor, control and log system functions. Along with the main system assembly, Eon has a secondary assembly that includes the video microscope, optical decoder and digital video mixer, which are output locally to a high resolution video projector, and sound system. This signal is duplicated for streaming to the web. Eon requires an extremely dark exhibition space for it to work properly. The specially lit space is required for optimal viewing and proper dark adaptation of the visitors eyes. It also provides most importantly for the sensitivity of the optical decoder which will pick up any source of visible light and convert it into audible sound. For navigation safety and installation visibility, a separate low level fully rectified DC lighting system will be installed. This system is invisible to the optical decoders used in Eon. Translated text will be keyed as closed captioning onto the live video image for the hearing impaired. With the majority of design, fabrication and proof of concept laboratory testing already achieved, the funding and focus of the New Media Fellowship would allow me to create a completed exhibition version, which will take approximately twelve to fourteen months. A substantial amount of proprietary systems have been invented specifically for Eon and appropriate research into patents and copyrights would also be conducted.

Installation Experience: As installation experience, visitors will enter a semi-darkened room with a richly detailed, small jewel like apparatus offset from the center of the space. The sound of computer generated voices in many languages will be clearly heard. The e-mail text will be globally translated into English and projected across the wall. In the distance, the image of a twinkling star floating in a glass jar at the center of the apparatus encourages curiosity of the visitors to take a closer look. As they move forward, the projected image of the "starlike" light source is now seen looming large on an opposite wall, stopping them for a moment to construct a conceptual framework for what they are seeing and hearing. As visitors move closer they see that the light source on the wall and in the water are the same and changing in sync with the words. As they study the tiny star and its attendant life support system, they can read the incoming e-mail text cued on a computer monitor, or read it as it is projected on the wall. They can read further about the piece on the website and begin to understand the incoming text is actually creating the light. A local (on-site) e-mail only computer kiosk allows them to write and send e-mail to Eon, and possibly hear their own words converted from text-to-speech, speech-to-sonoluminescent light, and light-to-sound. Printed gallery guides offer the project website to visitors so they may return online and participate in another dimension of the work. Telepresent visitors to Eon create the exhibition light source in real-time, and see the live video of the tiny enigmatic light. They can hear the words from the poetic text as they are decoded from the light, and online visitors can send e-mail directly to museum visitors and read further about the project.

Rockefeller Foundation New Media Fellowships

2003 Project Budget

SHAWN BRIXEY

Project Budget:

A: SUPPLIES and EXPENSES

1. Mail and Fed-X	fellowship funding	<u>\$200.00</u>
2. Color Photocopy	fellowship funding	<u>\$100.00</u>
3. Telephone, Facsimile, DSL	fellowship funding	<u>\$200.00</u>
4. Documentation, Film, Developing, DV Tape, DVD-R, CD-R, Editing	fellowship funding	<u>\$2100.00</u>
5. Crating, Shipping, Insurance	fellowship funding	<u>\$2000.00</u>
	Budget Total A:	<u>\$ 4600.00</u>

B: RESEARCH and COMPUTING EQUIPMENT

1. Major Research Equipment		
1.1. 1 Data Projector Sanyo PLC-XW20	fellowship funding	<u>\$2100.00</u>
1.2. 1 AppleG4 1GHz	fellowship funding	<u>\$2400.00</u>
1.3. 2 Dell Precision 340 PC	fellowship funding	<u>\$1600.00</u>
1.4. 2 Flat Panel LCD Displays	fellowship funding	<u>\$1400.00</u>
1.5. 1 Stanford Function Generator	fellowship funding	<u>\$3000.00</u>
1.6. 1 Sony C-Mount Video Camera	fellowship funding	<u>\$1200.00</u>
1.7. 1 Vacuum Pump	fellowship funding	<u>\$1200.00</u>
1.8. 8 Piezoceramic Transducers	fellowship funding	<u>\$1100.00</u>
	Budget Total B.1:	<u>\$14000.00</u>
2. Research Support Equipment		
2.1. 1 50' XVGa cable	fellowship funding	<u>\$100.00</u>
2.2. 1 Projector Mount	fellowship funding	<u>\$240.00</u>
2.3. 1 Video Mixer	fellowship funding	<u>\$1000.00</u>
2.4. 100' Shielded Electrical Cabling	fellowship funding	<u>\$200.00</u>
2.5. 10 Sony Mega Bass Walkman	fellowship funding	<u>\$1000.00</u>
2.6. 2 80GB Firewire Drive	fellowship funding	<u>\$500.00</u>
2.7. 4 MI Alesis Loudspeakers	fellowship funding	<u>\$1700.00</u>
2.8. 10 Pyrex 1000ml Tapered Flasks	fellowship funding	<u>\$200.00</u>
2.9. Misc. Hardware, Fasteners, etc.	fellowship funding	<u>\$500.00</u>
	Budget Total B.2:	<u>\$5400.00</u>

C: SOFTWARE and HARDWARE DEVELOPMENT

1. Project Software Development		
1.1. Computer Programming Research Assistant \$60.00 hr x 100 hrs		
	fellowship funding	<u>\$6000.00</u>
	Budget Total C:	<u>\$6000.00</u>

Rockefeller Foundation New Media Fellowships

2003 Project Budget (continued)

SHAWN BRIXEY

D: GRAPHIC DESIGN

1. Graphic Design for Web Interface and Print Design for Gallery Guide

1.1. Design Research Assistant \$50.00 hr x 40 hrs

fellowship funding \$2000.00

Budget Total D: \$2000.00

E: CLERICAL SUPPORT AND ASSISTANCE

1. Project Support

1.1. Clerical Assistance

(correspondence, shipping, accounting, purchasing) \$15.00 hr x 100 hrs

fellowship funding \$1500.00

Budget Total E: \$1500.00

F: RESEARCH FIELD TRAVEL

1. Estimated Project Research Air Travel

1.1. Round Trip Airfare U.S. @ \$350.00 ea. x 2 trips

fellowship funding \$700.00

2. Estimated Accommodations

3.1. \$100.00 per day x 8 days

fellowship funding \$800.00

Budget Total D: \$1500.00

TOTAL PROJECT BUDGET:

\$35000.00

Curriculum Vita

Shawn Brixey

Experimental media environments and interactive electronic installations inspired by and synthesized with theoretical physics, astronomy, cosmology and biology

Education

- 1988 MS, Massachusetts Institute of Technology, Media Lab, Cambridge, Massachusetts
- 1985 BFA, Kansas City Art Institute, Experimental Media, Kansas City, Missouri

Academic Positions

- 2002 Associate Director/Co-Founder, Center for Digital Arts and Experimental Media, University of Washington, Seattle, Washington
- 2002 Associate Professor, Digital Arts, University of Washington, Seattle, Washington
- 1999 Director, Center for Digital Art and New Media Research, University of California Berkeley, Berkeley, California
- 1998 Assistant Professor, Chair/Founder, Digital Media Program, Department of Art Practice, University of California Berkeley, Berkeley, California
- 1997 Distinguished Visiting Scholar, New Media Institute, San Francisco State University, San Francisco, California
- 1996 Acting Director, Center for Advanced Research Technology in the Arts and Humanities, University of Washington, Seattle, Washington
- 1994 Assistant Professor, Cross-Disciplinary Arts, School of Art, University of Washington, Seattle, Washington
- 1990 Visiting Assistant Professor, Chair/Founder, Media Arts Program, College of Fine Arts, University of Kentucky, Lexington, Kentucky
- 1989 Inaugural Leonardo Fellow, School of Art, University of Michigan, Ann Arbor, Michigan
- 1988 Lecturer, Center for Advanced Visual Studies, Department of Architecture, Massachusetts Institute of Technology, Cambridge, Massachusetts

Academic Research Initiatives

- 2001 Executive Council Member, Berkeley Institute for Design, CITRIS Initiative, College of Engineering, University of California Berkeley
- 2000 Executive Council Member, The Consortium for the Arts, Organized Research Unit, University of California Berkeley
- 2000 Executive Council Member, College of Environmental Design's, Center for Design Visualization, Organized Research Unit, University of California Berkeley
- 1999 Executive Committee and Research Council Member, System-wide Digital Media Innovations Agency, University of California
- 1998 Primary Investigator, Co-Founder, of Multi-Campus Research Group, UC Digital Arts Research Network, Office of the President, University of California
- 1998 Executive Council Member, President's Planning Group on Digital Art, Office of the President, University of California
- 1996 Co-Director/Co-Founder, Laboratory for Animation Arts, University of Washington, Seattle, Washington

Selected Exhibitions and Events

- 2002 Henry Art Gallery, University of Washington, Seattle, Washington, "Gene(sis): Contemporary Art Explores Human Genomics", *Chimera Obscura*, with Richard Rinehart, Commissioned Telerobotic Installation; on-line catalog and CD-ROM
- 2001 Institute for Studies in the Arts, Phoenix, Arizona, *Secret Agents*, in collaboration with UC Digital Arts Research Network, Commissioned Networked Opera; on-line catalog and CD-ROM
- 2000 Cooper Hewitt Museum, New York, New York, "First American Architecture and Design Triennial", *Liquescence*, in collaboration with LOOM Studio Architects, Commissioned Environmental Electronic Installation; catalog and PBS television
- 1999 Matthews Center, Arizona State University, Phoenix, Arizona, *Input – Output*, Telesculpture 99, networked rapid prototyping exhibition between Hong Kong, Paris and Boston
- 1998 Winter Olympics, Nagano, Japan, *Alchymeia*, Commissioned Ice Crystal Installation and Telepresence Project
- 1997 Exploratorium, San Francisco, California, *Global Bodies*, 24 hr live Internet Project
- 1997 Art Institute of Chicago, Chicago, Illinois, "International Symposium for Electronic Art", *Alchymeia*, Commissioned Internet Telepresence Project; catalog
- 1996 Delaware Center for Contemporary Art, Wilmington, Delaware, "Chaos of Delight" *Instruments of Material Poetry*, Anti-Gravity Project; catalog
- 1995 M.I.T. Museum, Cambridge, Massachusetts, "Light-Space-Time", *Instruments of Material Poetry*, Anti-Gravity Project
- 1994 Kunsthochschule fur Medien Koln, Germany, "Solart", *Instruments of Material Poetry*, Live Node Internet Exhibition
- 1992 State Museum, Columbia, South Carolina, "Contemporary Images", *Celestial Vaulting*, Interferometric Commissioned Holography Installation; catalog
- 1992 Center for Contemporary Art, Lexington, Kentucky, *Instruments of Material Poetry*, Anti-Gravity Project
- 1991 Contemporary Art Center, Cincinnati, Ohio, "MECHANIKA", World Premiere, *Celestial Vaulting*, Interferometric Commissioned Holography Installation; catalog
- 1990 Massachusetts Institute of Technology, Cambridge, Massachusetts, "ARTTRANSITION 90", *Art of the Future and Radical Concepts*, Installation
- 1990 Cranbrook Academy of Art Museum, Bloomfield Hills, Michigan, Two Person Show with Yoko Ono, "*Celestial Vaulting*"; Commissioned Interferometric Holography Installation
- 1989 Yeshiva University Museum, New York, New York, "Lights Orot", World Premiere, Commissioned Interactive Installation; catalog
- 1988 Badischer Kunstverein, Karlsruhe, Germany "85th Anniversary of the Deutscher Kunstlerbund", Interactive Installation; catalog
- 1987 Documenta 8, Karlsruhe, Germany, *Sky Chasm*, in collaboration with the Laura Knott Dance Company, Commissioned Interferometric Holography Installation Performance; catalog
- 1987 M.I.T. Museum, Cambridge, Massachusetts, *Aqua Echo*, in collaboration with the Laura Knott Dance Company, Commissioned Interactive Ice Crystal Installation Performance
- 1986 Smithsonian World Television, National Endowment for the Arts, "Desert Sun/Desert Moon", Lone Pine, California, *Photon Voice*, in collaboration with the Laura Knott Dance Company, Commissioned Interactive Optical Encoding Installation Performance

Selected Reviews, Books, Media, and Reference

- 2002 "Digital Culture, The Fusion of Art and Technology" Seattle Times, Thursday, October 3, Seattle, Washington
- 2002 "Secrets of the Sequence" PBS Television Program 108, *Chimera Obscura*, Cronkite/Ward, June, Washington, D.C.
- 2002 "Wonders of Genetics Breed New Art" New York Times, Sunday, May 26, New York, New York
- 2002 "Art Ponders Genome Implications" Boston Globe, Sunday, April 7, Boston, Massachusetts

- 2002 "Seattle Show Brings DNA to Life" Seattle Times, Saturday, April 6, Seattle, Washington
- 2002 "Playful Look at Consequences of Genetic Exploration" Seattle Post, Saturday, April 6, Seattle, Washington
- 2002 "Haunted Houses, Art and Science" The Stranger, Vol 11 No. 29, Apr 4 - Apr 10 2002, Seattle, Washington,
<http://www.thestranger.com/2002-04-04/art.html>
- 2001 "Springboard" PBS syndicated television program, July 7,
San Francisco, California
- 2001 "Information Arts, the Intersection of Art, Science and Technology" Stephen Wilson, MIT Press, Cambridge,
Massachusetts, ISBN: 026223209X
- 2001 "Robot in the Garden, Telerobotics and Telepistemology in the Age of the Internet" Ken Goldberg, MIT Press,
Cambridge, Massachusetts,
ISBN: 0262072033
- 2000 "Next Generation of Digital Media Makers" Film/Tape World Magazine, January, San Francisco, California
- 2000 "New Medium, New Message" San Francisco Chronicle, February 21,
San Francisco, California
- 2000 "Art on the Internet" The Berkeleyan, Vol.28, No.21, February 9-15,
Berkeley, California
- 1999 "Digital Dreams" San Francisco Chronicle, December 8,
San Francisco, California
- 1999 "New Prodigies, The American Avante Garde" Surface Magazine, October/December, No. 20, San Francisco,
California
- 1999 "Framing the Questions, The Arts and Humanities at Berkeley", University of California Press, Berkeley,
California
- 1999 "High Tech Tools" Time Out Magazine, The Times, June 25,
Walnut Creek, California
- 1999 "Digital Deco" The Californian, December 2, Berkeley, California
- 1998 "Changing the Landscape of Art" The Berkeleyan, Vol.27, No.9, October 7-13,
Berkeley, California
- 1998 "Going for the Gold" Wired Magazine, Feb 17, San Francisco, California,
www.wired.com/news/news/culture/story/10326.html
- 1994 "International Directory of Electronic Arts" Annick Bureaud, CHAOS, 3rd Edition, Paris, France
- 1994 "Art Program Loses Leader" The Kentucky, Vol. XCVI, No. 146, April 29, Lexington, Kentucky
- 1993 "Video Dream to Versailles", The Woodford Sun, Vol. 125, No. 49, December 9, Versailles, Kentucky
- 1993 "Eat the Box" ACE Magazine, Vol.5, No. 6, May 1, Lexington, Kentucky
- 1992 "Aqua Echo" Center Magazine (cover story), The Kentucky Center for the Performing Arts, Vol.VIII, No.1,
December/January, Louisville, Kentucky
- 1992 "Art of the Electronic Age" Frank Popper, Thames and Hudson, London, England ISBN: 0-8109-1928-1
- 1992 "Primal Light" The State, Vol. 101, No. 316, November 22, Columbia,
South Carolina
- 1992 "Visceral Muse", Susan Parsons, WQTV, Television 36, Live Interview,
April 15, Lexington, Kentucky
- 1992 "First Experimental Video at The Kentucky" Lexington Herald-Leader, Vol., No. 113, April 25, Lexington,
Kentucky
- 1991 "Elektronisches Gestalten in Kunst und Design" Jurgen Claus, Rowohlt Press, Hamburg, Germany, ISBN:
3499181940
- 1991 "Building His Imagination" Lexington Herald-Leader, (arts cover story), Vol.10, No. 80, March 22, Lexington,
Kentucky
- 1991 "Spotlight on the Arts, Celestial Vaulting Project", Beth Craig, WXLG Radio, Interview, Part 1, September 15,
Part 2, September 22,
Lexington, Kentucky

- 1991 "Poets with Power Tools", Cincinnati Inquirer, Vol. 151, No. 44, May 23, Cincinnati, Ohio
- 1991 "Southern Wandering", The State, Vol. 101, No. 266, October 3, Columbia, South Carolina
- 1991 "21st Century Art/Shawn Brixey at the Cutting Edge", ACE Magazine, Vol., No. 4, July 1, Lexington, Kentucky
- 1991 "MECHANIKA", Alternatives Magazine, Vol.1, No. 2, March/June, Cincinnati, Ohio
- 1991 "Cerebral Art", Cincinnati Enquirer, Vol. 151, No. 89, July 7, Cincinnati, Ohio
- 1991 "Baffling Art", Cincinnati Enquirer, Vol. 151, No. 52, May 31, Cincinnati, Ohio
- 1991 "Machine is the Medium and the Message", Lexington Herald-Leader, Vol. 9, No. 68, June 16, Lexington, Kentucky
- 1990 "New Art Faculty", Lexington Herald-Leader, Vol. 8, No. 279, September 19, Lexington, Kentucky
- 1990 "The New Immaterialists", Frank Popper, Kunst Forum, Vol. 50, No.4, October, Koln, Germany
- 1990 "After Hours", The Vista Genesis Project, David Larkin, WMBR Radio, October 31, Interview, Boston, Massachusetts
- 1990 Attila Czaji, "Art and Technology Works", Mucsarnok Publishers, ISBN: 963-7402-49-7 Budapest, Hungary
- 1990 "ARTTRANSITON 90 MIT", TV-2 West German Television Interview, November 3, Boston, Massachusetts
- 1990 "Shawn Brixey and Curious Miracles", The Kentucky, Vol. XCIV, No. 52, December 14, Lexington, Kentucky
- 1990 "The New Immaterialists", Frank Popper, Kunst Forum, Vol. 50, No.4, October, Koln, Germany
- 1990 "Cosmic Digital Code", Jurgen Claus, Leonardo Magazine, Vol. 24 No. 2, London, England
- 1989 "Celestial Vaulting", Detroit Free Press, Vol. 8, No. 3, November, Detroit, Michigan
- 1989 "Art Tech 89", Chunichi Shimbun, November 10, Nagoya, Japan
- 1989 "Shawn Brixey, Inaugurates "Leonardo Project", University Record, Vol. 43, No. 20, February 1, Ann Arbor, Michigan
- 1988 "Lights/Orot, Yeshiva University Exhibition" Art News, September, Page 168-70, New York, New York
- 1987 "Natur und Technologie, Shawn Brixey und Laura Knott", WolkenKratzer, Art Journal, Vol. 4, Juni, Juli, August, Hamburg, Germany
- 1987 "Optische/Akustische Klang Performance, Shawn Brixey", Wiener Magazine, Deutschlands Zeitschrift fur Zeitgeist, Juni, Koln, Germany
- 1987 "Deutscher Kunsterlexicon und Archiv", Weber und Wiedemeyer, GmbH Co. KG, Kassel, Germany, ISBN: 3-925272-14-3

Selected Grants, Awards and Distinctions

- 2002 Intel Corporation, Mountain View, California, \$25K Co-Inv. with Greg Niemeyer
- 2001 Henry Art Gallery, "Chimera Obscura", University of Washington, Seattle, Washington, Co-Inv. with Rick Rinehart, \$15K commission
- 2000 Hellman Award for Distinction in Research, Office of the President, University of California Berkeley, "The Eon Project", \$21K Honorarium
- 2000 Boxlight Corporation, "Liquiesence", Poulsboro, Washington, \$15K PI
- 2000 National Design Museum, "Liquiesence", New York, New York, \$5K Co-PI
- 2000 UC Digital Arts Research Network, Multi-Campus Research Group, Office of the President, University of California with UCB, UCSC, UCSD, UCLA, UCD, \$500K Co-PI
- 1999 Educational Technology Grant, "Center for Digital Art and New Media Research", Office of the Executive Vice Chancellor, University of California, Berkeley, \$30K Co-Inv. with Alice Agogino
- 1999 Digital Secrets Exhibition, "Secret Agents Networked Opera", Institute for Studies in the Arts, Arizona State University, Tempe, Arizona, \$15K Commission PI
- 1998 Faculty Research Award, "Computer Holography", Committee on Research, University of California, Berkeley, \$7K PI
- 1998 Finalist, EXPO 2000 Design Competition, "Epicycle", Hannover, Germany, \$5K design honorarium

- 1998 Capitol Projects, "Center for Digital Art and New Media Research", Office of the Dean, Arts and Humanities, University of California, Berkeley, \$40K PI
- 1997 National Institute of Health, Washington D.C., No. 1R18AI40674-01A1, Public Service Campaign, \$1.6M Co-Inv. with Margaret Allen
- 1997 Intel Corporation, Mountain View, California, \$250K Co-Inv. with Richard Karpen
- 1997 San Francisco State University, Institute for New Media, San Francisco, California, First Distinguished Mentorship in New Media, \$25K Honorarium
- 1996 Yakima Industries, Arcata, California, "Aqua Echo", \$6K PI
- 1996 Scientific Kelvinator, Walnut Creek, California, "Aqua Echo", \$5K PI
- 1996 U.S. Filter, Renton, Washington, "Aqua Echo", \$3K PI
- 1996 University of Washington, College of Arts and Sciences, Seattle, Washington, Curriculum Innovation Award, \$10K Co-Inv. with Richard Karpen
- 1996 University of Washington, Office of the Provost, Seattle, Washington, Classroom Support Grant/Capitol Projects, \$60K LA2 Renovation, with Richard Karpen
- 1996 Alias/Wavefront, Mountain View, California, "Laboratory for Animation Arts", \$250K Co-Inv. with Richard Karpen, and David Salesin
- 1995 University of Washington, College of Arts and Sciences, Seattle, Washington, Educational Technology Grant, \$15K Co-PI with Richard Karpen
- 1995 Newport/Klinger, Irvine, California, "Computer Holography for the Laboratory for Animation Arts", \$25K PI
- 1995 University of Washington, Office of Research, Seattle, Washington, Royalty Research Fund, Computer Holography, \$40K PI
- 1995 Silicon Graphics Industries, Mountain View, California, "Laboratory for Animation Arts Launch Donation", \$650K Co-PI with Richard Karpen, and David Salesin
- 1995 Microsoft Incorporated, Bellevue, Washington, SoftImage Licenses, \$350K Co-PI with Richard Karpen, and David Salesin
- 1995 Apple Computer Incorporated, Cupertino, California, "Luna Memoria", \$15K PI
- 1995 University of Washington, Graduate School, Seattle, Washington, Matching Grant-Apple Computer, \$16K PI
- 1995 University of Washington, College of Arts and Sciences, Seattle, Washington, Matching Grant-Apple Computer, \$10K PI
- 1993 ITA Corporation, Cincinnati, Ohio, Light Valve Projector, "Eat the Box", The Kentucky Theater, \$2.5K PI
- 1993 Kentucky Arts Council, Owensboro, Kentucky, Fellowship New Media, "Arts Embrace", First State Conference on the Arts, \$2.5K PI
- 1992 South Carolina Arts Commission, Columbia, South Carolina, "Celestial Vaulting", \$8K commission
- 1992 South Carolina State Museum, Columbia, South Carolina, "Celestial Vaulting", \$3.5K commission
- 1992 Kentucky Arts Council, Travel Grant, Frankfort, Kentucky, "Celestial Vaulting", \$2K PI
- 1992 Delaware Council for the Arts, New Forms Review Panelist, Newark, Delaware, honorarium
- 1992 Kentucky Arts Council, Inaugural New Media Fellowship, Frankfort, Kentucky \$5K fellowship
- 1992 National Association of State Art Agencies, Invited Peer Review Expert, New Art Forms, Metropolitan Museum of Art, New York, New York, \$2.5K honorarium
- 1991 National Endowment for the Arts, New Forms Initiative, Atlanta, Georgia, \$5K PI commission
- 1991 Javelin Electronics, Pasadena, California, "Instruments of Materials Poetry", \$2.5K PI, high resolution video camera
- 1991 Leica/Optical, Chicago, Illinois, "Instruments of Materials Poetry", \$10K PI, microscopy equipment
- 1991 Perkin Elmer Corporation, Oak Brook, Illinois "Instruments of Material Poetry", \$1K PI, holography optics
- 1991 Contemporary Arts Center, MECHANIKA, Cincinnati, Ohio, "Celestial Vaulting", \$2.5K commission
- 1990 Finalist, Media Park Koln Design Competition, M.I.T. Center for Advanced Visual Studies, Design Team, Koln, Germany, \$2.5K design honorarium
- 1990 3M Corporation, Medical Division, Saint Paul, Minnesota, "Vista Genesis", \$1.5K PI

- 1990 Michigan Council for the Arts, Lansing, Michigan "Celestial Vaulting", \$2.5K PI project grant
- 1990 Cranbrook Educational Community, Bloomfield Hills, Michigan "Celestial Vaulting", \$2.5K commission
- 1990 Prodelin Satellite Communications Corporation, Newton, North Carolina, \$2.5K PI
- 1989 3M Corporation, Coatings Division, Saint Paul, Minnesota, "Celestial Vaulting", \$1.5K mylar
- 1988 IBM GmbH, Stuttgart, Germany, "85th Anniversary of the German Art Union", \$2.5K PI
- 1987 Massachusetts Council for the Arts and Humanities, Boston, Massachusetts, Special Projects Grant, "Sky Chasm", \$10K Co-PI with Laura Knott
- 1987 Massachusetts Institute of Technology, Provost Award, Documenta 8, "Sky Chasm", \$2K Co-PI, with Laura Knott
- 1987 Council for the Arts at M.I.T., Cambridge, Massachusetts, Documenta 8, "Sky Chasm", \$2K Co-PI, with Laura Knott
- 1987 Hughes Aircraft Corporation, Carlsbad, California, Documenta 8, "Sky Chasm", \$2K PI
- 1987 Documenta 8, GmbH, Kassel, Germany, "Sky Chasm", with Laura Knott, \$25K Co-PI, commission
- 1986 PTR Optical Corporation, Watertown, Massachusetts Documenta 8, "Sky Chasm", \$2K PI
- 1986 Council for the Arts at M.I.T., Cambridge, Massachusetts, "Aqua Echo", \$2K Co-PI with Laura Knott
- 1986 Cambridge Reichert-Jung Optical Corporation, Buffalo, New York "Aqua Echo", \$1.5K PI
- 1986 National Endowment for the Arts, Washington, D.C., CAVS/M.I.T. Inter-arts Project, "Desert Sun/ Desert Moon", \$82K Co-PI, group project grant
- 1986 American Optical Corporation, Rochester, New York, \$2.5K PI
- 1986 WETA, Corporation for Public Broadcasting, Smithsonian World Television, Washington, D.C., "Photon Voice", \$2K PI

Selected Public Lectures

- 2002 Agents of Change, National Association of Media Arts Conference, Seattle, Washington, October 3-6
- 2002 *Chimera Obscura* and the Ghost of the Minotaur, Henry Gallery, University of Washington, Seattle, Washington, January 23-27
- 2002 *Chimera Obscura*, Media Art and Technology, University of California, Santa Barbara, January 14-15, declined
- 2002 020202, Conference on Social Technologies, Sponsor Intel, Berkeley, California, November 3
- 2001 Teletobotics, San Francisco Media Arts Council, Berkeley, California, November 3
- 2001 New Media}tors, Berkeley Art Museum, Berkeley, California, September 23
- 2001 *Eon*, San Francisco Museum of Modern Art, 010101, March 23
- 2001 Art and Human Genomics, Henry Gallery, University of Washington, Seattle, Washington, December 1-3
- 2000 PlanetWorks, Art and Biotechnology Keynote Speaker, International Planetworkers Conference, San Francisco, May 5-11
- 2000 CRASH, Berkeley Symposium on Critical Issues in Net Art", Speaker and Symposium, Co-Chair with Ken Goldberg, Consortium for the Arts, University of California Berkeley, February 16-20
- 1999 @ the Intersection, Art and Technology in the Digital Age, Discover Berkeley, The College of Arts and Sciences, December 6-7,
- 1999 *Alchymeia* - In Conversation, The Townsend Center for Humanities, University of California, Berkeley, March 30
- 1999 UC Digital Arts Research Network, National Conference, Corporation for Educational Network Initiatives in California, Monterey, California, May 6-7
- 1999 *Curious Miracles*, Arizona State University, Institute for Studies in the Arts, Tempe, Arizona, March 3-7
- 1999 Better Living, Henry Art Gallery, University of Washington, Seattle, Washington, Jan. 23-27
- 1998 Net-Art, Distinguished Lecturer in the Arts, Seattle Public Library, Seattle, Washington, June 23
- 1998 *The Epicycle Project*, Weltausstellung/World's Fair, EXPO/2000, March 9-15 Hannover, Germany
- 1998 Art and Emerging Technology, Keynote Address, International Technology Summit, Yerba Buena Center for the Arts, San Francisco, California, February 24-28

- 1998 Visiting Artist Lecture, The Exploratorium, San Francisco, California, January 21-24
- 1997 Art and Emerging Technology, Keynote Address, International Technology Summit, Yerba Buena Center for the Arts, San Francisco, California, February 24-28
- 1997 The New Media Institute, San Francisco State University, San Francisco, California, December 4-8
- 1996 Virtual Culture, Bellevue Art Museum, Bellevue, Washington, December 18
- 1996 *Alchymeia*, San Francisco State University, San Francisco, California, December 4-8
- 1995 Computer Holography, College of Engineering, Computer Science Colloquia, University of Washington, Seattle, Washington, Nov. 29
- 1995 *Curious Miracles*, College of Engineering, Computer Science Colloquia, University of Washington, Seattle, Washington, May 3
- 1994 Experimental Art Forms, Western Washington University, Bellingham, Washington, May 10
- 1994 Console-ing Passions, PBS/Alternative Visions, National Video Conference, University of Washington, Seattle, Washington April 6-9
- 1993 Kentucky Arts Council, Moderator, "Expanding Boundaries Program", Southeastern Colleges of Art Conference, University of North Carolina, Chapel Hill, North Carolina
- 1993 Technology Arts Laboratory, Ohio State University, Columbus, Ohio, April 6-9,
- 1993 *Instruments of Material Poetry*, California State University, Long Beach, California, March 26
- 1992 *Vista Genesis Projects*, South Carolina State Museum, Columbia, South Carolina, December 6
- 1992 Informance, Curious Miracles, Clemson University, Greenville, South Carolina, September 22,
- 1991 National Association of State Art Agencies, New Art Forms, The Space Program, New York, New York, November 7-10
- 1991 The Artist Speaks, Kentucky State University, Frankfort, Kentucky, February 28
- 1990 ARTTRANSITION 90', Electrophosphenes & Radical Concepts, Massachusetts Institute of Technology, Cambridge, Massachusetts, October 28
- 1990 *Celestial Vaulting*, Physics and Cosmology Lecture Series, University of Kentucky, Lexington, Kentucky, September 12
- 1990 Arts Professions, Art of the Future, University of Kentucky, Lexington, Kentucky, August 31
- 1989 *Celestial Vaulting*, Cranbrook Academy of Art Museum, Bloomfield Hills, Michigan November 19
- 1989 *Photon Voice and Aqua Echo*, Cranbrook Academy, Bloomfield Hills, Michigan, November 17
- 1988 Leonardo Project Inauguration, Art and Technology, University of Michigan, Arbor, February 4
- 1987 *Desert Sun-Desert Moon*, Kansas City Art Institute, Kansas City, Missouri, May 9

Selected University Service

- 2001 Executive Council Member (ORU), College of Environmental Design, Design Visualization Center, University of California Berkeley
- 2000 Executive Council Member (ORU), Consortium for the Arts, University of California Berkeley
- 2000 Board of Director's, Berkeley Art Museum, New Media Committee, University of California Berkeley
- 1999 President's Planning Group on Digital Arts, Office of the President, University of California Berkeley
- 1999 Executive Council Member, University of California Digital Arts Research Network (MRG), Office of the President
- 1998 Director of the Center for Digital Art and New Media Research, University of California