**sonicSENSE**
http://www.sonicsense.net

# TRANSMUTATIONS

**Presented by SonicSENSE and GAFFTA**

## Exhibition Description

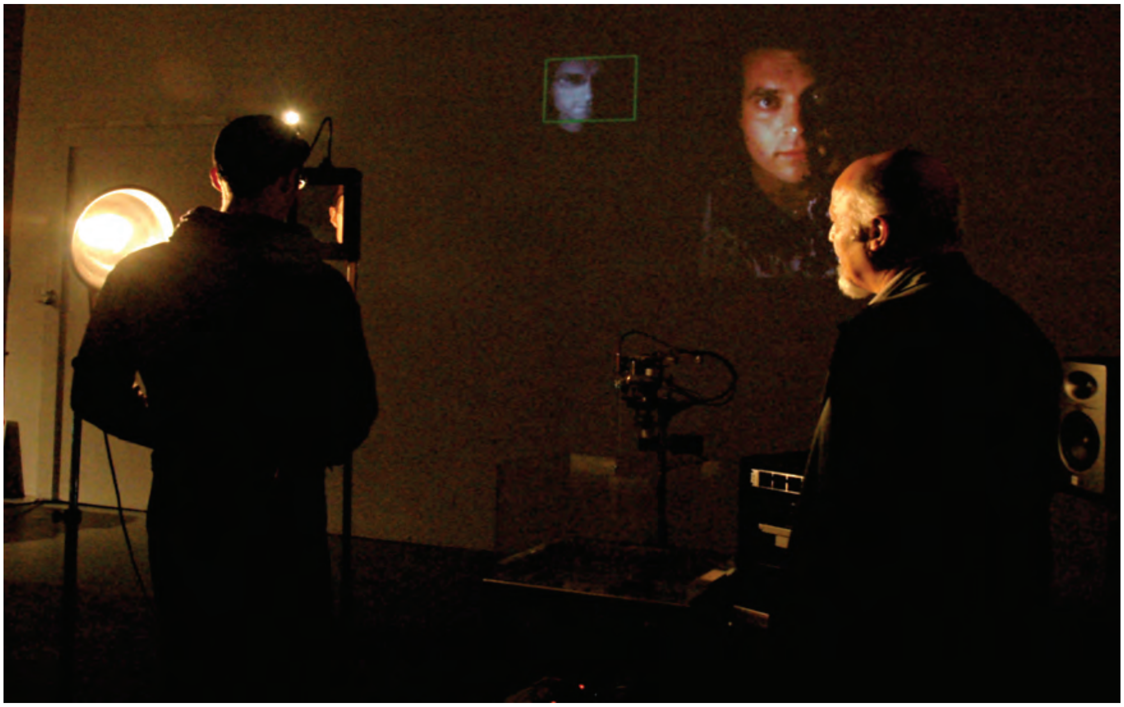
TRANSMUTATIONS is the most recent iteration of the sonicSENSE platform created by Barney Haynes and Jennifer Parker in collaboration with Mechatronics graduate students in the Digital Art New Media program and the Arts + Physics Lab at the University of California Santa Cruz .

TRAMUTATIONS by sonicSENSE at GAFFTA is a site-specific information ecology, consisting of a complex series of sound sculptures, machines, video projections and sensors. Two systems drive this project: user interaction and data visualizations. User interactivity produces a wide range of soundscapes, data projections and mechanical sounds that collect and distribute media into the exhibition space. Data content for TRANSMUTATIONS consists of, data parsed from auscultation libraries, audio from the California Library of Natural Sounds at the Oakland Museum of California, data collected from the UCSC Arts and Physics Lab and on-site data in the gallery space.

By taking data out of archives, pie charts and graphs and giving it a physical form through sculptural, audio and visual means, we aim to build a compelling experience synthesizing scientific research with new media as a method of engaging community participation. We believe in the concept of learning by doing, that material exploration is an important part of the understanding process and that explaining through tangible tools, where people can actually touch, explore and play with information, is essential to collaborative communication and visual thinking.

SonicSENSE created by Barney Haynes and Jennifer Parker in 2008, is an expandable and evolving site for art, culture, new technologies, digital media, collaboration, and participation. SonicSENSE uses the creative diversity of computational media and traditional visual art practices to cultivate space for sharing, questioning, and exploring interdisciplinary frameworks, methodologies, and experiences. Each exhibition of the platform is a new iteration consisting, including, artists, composers, musicians, scientists and programmers.

For more information about sonicSENSE please visit www.sonicsense.net



# BubbleTRANSIT, an erosive drawing mechanism

**Barney Haynes, Jennifer Parker and Kevin Murphey**

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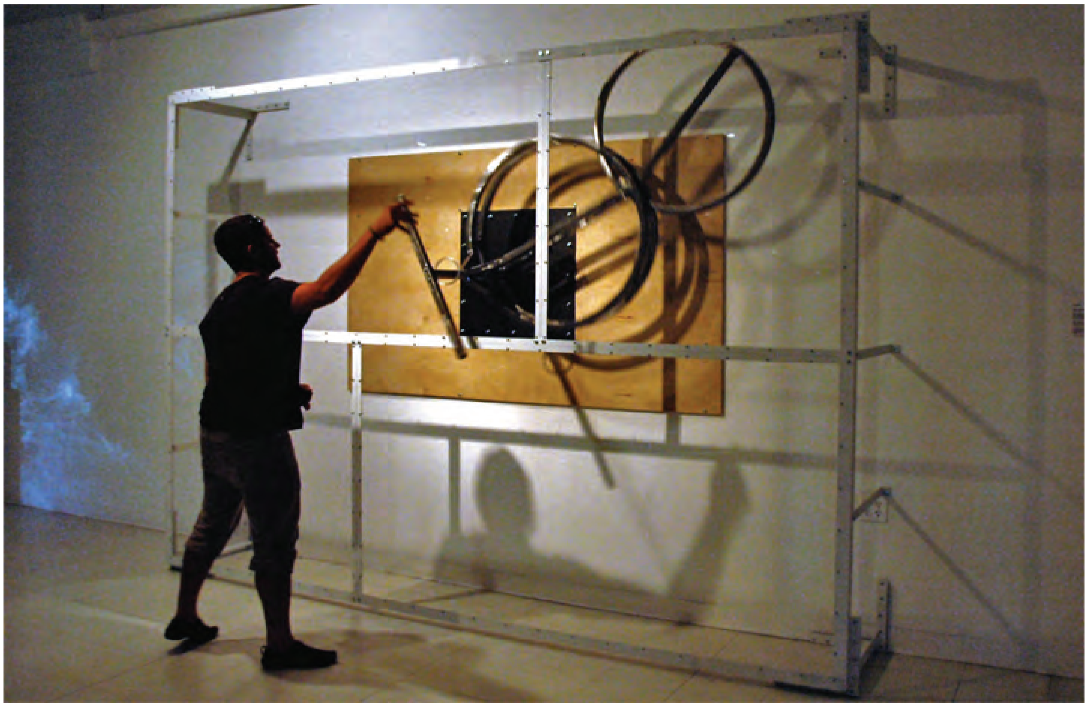
BubbleTRANSIT uses air, water and sound as an erosive drawing mechanism to reveal digital portraits and internal sounds of the body. A robotic arm blows bubbles into a tank of water as a viewer stands on a vibrating ramp looking into a mirror. A computer-generated voice deploys actions to the viewer to secure a digital portrait. An erosive drawing produced by the tracking of air bubbles in the tank reveals the portrait, layered directly on top of the last image.

The air bubbles in the tank and the viewer on the ramp inform the spacialized sound for the installation. The sounds are found audio-clips from Auscultation libraries on the Internet. Auscultation is the technical term for listening to the internal sounds of the body, usually using a stethoscope.

tech specs: MakingThings + mac minis + kinect + webcam + projector + butt kickers +servo motors and drivers + robotoic arm + Max/MSP + c++

DIGITAL ARTS NEW MEDIA · Arts Research Institute · CCA · UCIRA UNIVERSITY OF CALIFORNIA INSTITUTE FOR RESEARCH IN THE ARTS · OAKLAND MUSEUM OF CA · THE ARTS UC SANTA CRUZ · openlab UCSC COLLABORATIVE RESEARCH



# PhaseSpace, a study of choas

**A collaboration with Nathan Kandus, Jill Naiman, Rachel Strickler and Jennifer Parker**

PhaseSpace is a study of the nature of chaotic systems. A double pendulum-a pendulum mounted onto the bottom of another pendulum-is a system that swiftly becomes unpredictable, yielding a wide variety of exciting and unpredictable movements. This pendulum, which can swing more than ten feet off the ground, is a mesmerizing and imposing object. To give light to some aspects of this chaotic system, a display next to the pendulum produces 'drawings' of various physical quantities of the pendulum's movement.

When a chaotic system is mapped in a six-dimensional space (also known as phase space: three spatial dimensions and a corresponding velocity to each), it becomes possible to take a surface of section from this phase space. A surface of section plots position versus velocity, and can be used to display both deterministic and chaotic systems. When using a surface of section to understand a chaotic system, the visual result is a somewhat ordered plot. This order seems to come out of nowhere, considering that the system it is modeling is unpredictable; yet this reveals a deeper nature of the chaotic system.

tech specs: rotary encoders + processing + arduino + mac mini + projector

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# SoundPool: California’s Natural Sounds

**Barney Haynes, Jennifer Parker, Andre Marquetti and Amasa Warner**

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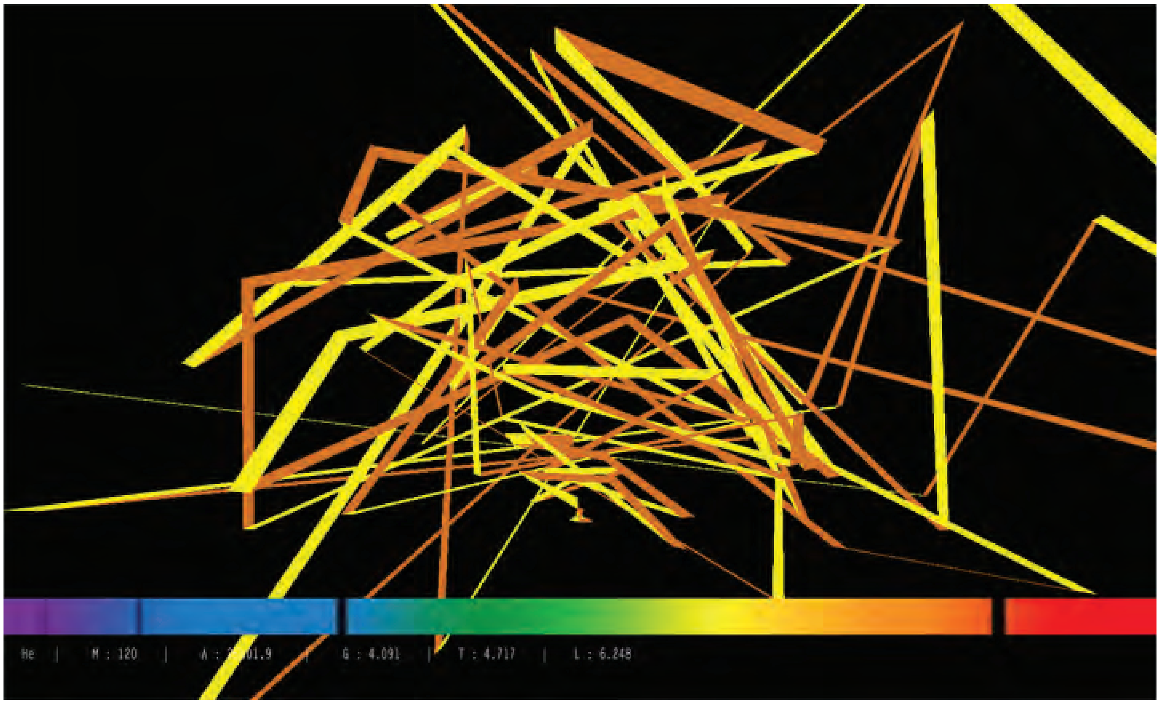
SoundPool is an interactive sound installation for viewers to dynamically interact with the Oakland Museum of California’s Natural Sounds archive. The archive of audio recordings is a comprehensive collection of nature sounds with an emphasis on California species and environments. It includes the sounds of specific insects, amphibians, reptiles, birds and mammals, as well as natural, ambient soundscapes. http://museumca.org/collection/library-natural-sounds.

tech specs: (9)xbox gametrack controllers + Max/MSP + mac mini + motu + (4) speakers






# StellarMATTER, the life of a star

**Nathan Kandus, Joe Cantrell, Dustin Raphael, Barney Haynes, Jennifer Parker, and Robert da Silva**

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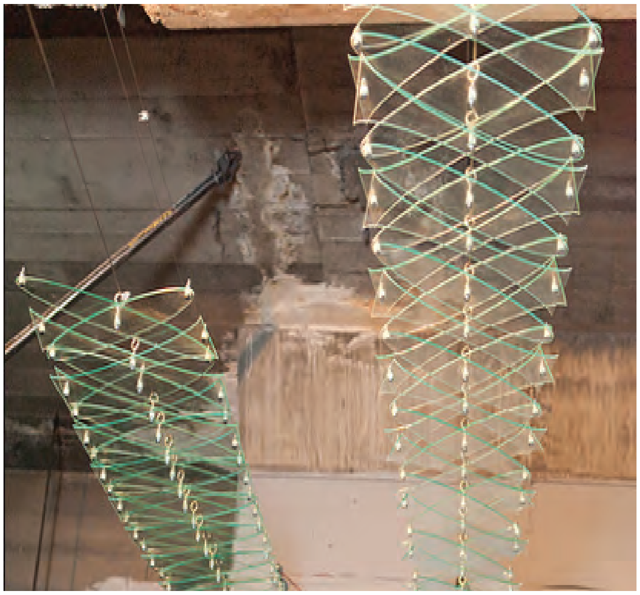
**StellarMATTER uses life-cycle data from multiple simulated stars to exemplify the relationship between stellar matter and life on Earth, allowing the viewers to take control over the life of a star. In giving viewers the power to change the parameters determining the physical characteristics of the star, mass and age, they are able to manipulate the temperature, luminosity, gravity, and element being produced in the star, as well as a variety of other characteristics. A spectral filter applied to the sound recordings directly translates the astral light spectrum information of a star. Additionally, information is displayed in the form of "physical bar graphs" which move above the viewer's head.**

**tech specs: mac minis + projectors + arduino + megamotos+ gear motors + potentiometers + xbox gametrack controllers + motu + speakers + processing + Max/MSP**



# StellarMATTER, the life of a star

**Nathan Kandus, Joe Cantrell, Dustin Raphael, Jennifer Parker, and Barney Haynes**

StellarMatter explores the life of a star. A large part of the way that our universe looks, from galaxies and globular clusters, to our home here on earth, is due to stars. Aside from hydrogen, helium, and elements made in a laboratory, every element in the universe is made by a star.

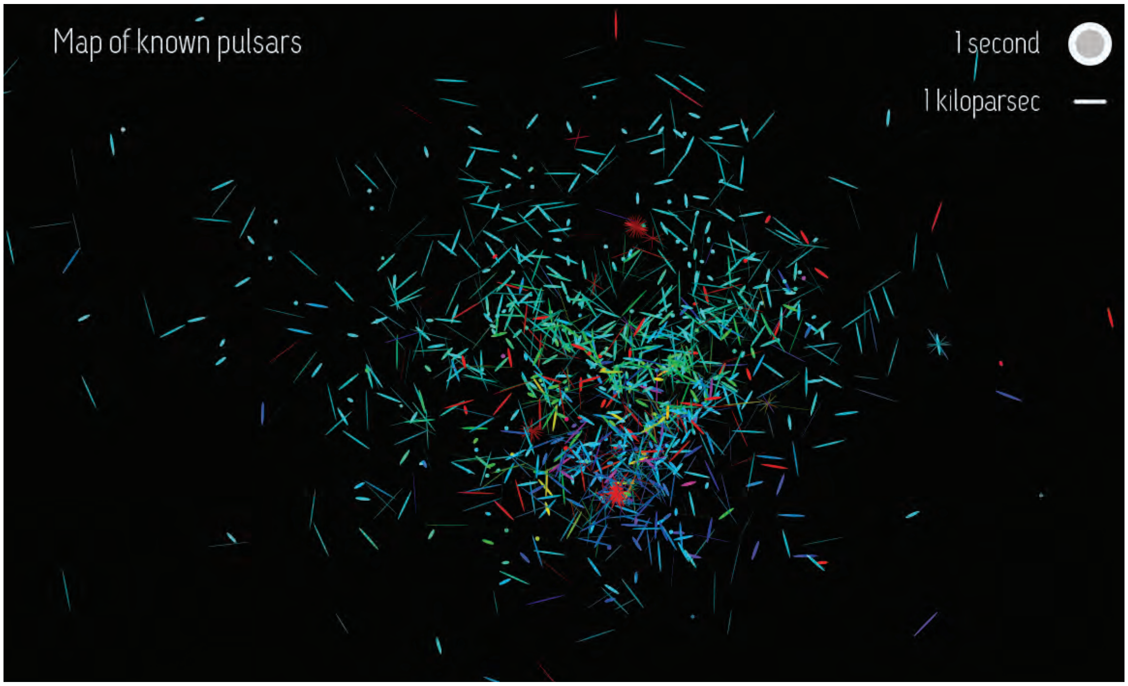
The largest singular factor to a star's life path is its mass. Depending on this, it will go through a determined set of dynamic stages in which its physical characteristics change, including size, temperature, luminosity, gravity, and the element it is creating.

Stellar Evolution takes this concept, allowing the viewer to adjust the mass of the star (0.8 solar mass – 120 solar mass), and then cycle through that star's life by adjusting the age (2500 years to 2.5x1010 years). The result of this is the display of three important characteristics of the star:

Temperature: (3,000K – 30,000K) Temperature at the surface of the star. This determines which color it appears to be. More massive stars are 'bluer' and less massive stars are 'redder'. When stars reach their last stages they can have very large changes in their temperature.

Luminosity: (10-4 solar luminosity - 106 solar luminsoity) Luminosity is akin to the brightness of a star. More luminous stars are more massive and live shorter lives. The luminosity of a given star slowly increases until it reaches its last stages of evolution when it can sometimes become much more luminous.

Gravity: (0 g – 5 g) How 'puffy' the star is; which in turn effects how narrow or broad its spectral lines are. Higher gravity means a less puffy star with broader spectral lines. A lower gravity means a puffier star with narrower spectral lines. As a star goes through its last stages sometimes it can become quite puffy.




# SonicSENSE and GAFFTA Open-Call for Processing Sketches
## **Featured Artist:** Laura Kogler

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**Pulsar Visualization**

Each object in this visualization is a pulsar. Pulsars are neutron stars -- the ultra-dense remnants of collapsed stars. Neutron stars typically have a mass greater than our sun, but a radius of only about 10 miles! Like a figure-skater pulling in her arms to spin faster, a slowly rotating star can end up spinning very fast after it collapses into a neutron star (up to hundreds of times per second!). A neutron star may emit a beam of intense radiation which points in different directions as it spins. From earth, it looks like the star is blinking on and off as the beam is pointed toward and away from us.This called a pulsar.

The objects in the visualization correspond to observed pulsars from the ATNF Pulsar Catalogue (http://www.atnf.csiro.au/research/pulsar/psrcat). Each pulsar appears at its observed coordinates in the galactic plane and is blinking at its observed frequency. The color is based on the frequency of radio waves emitted by the pulsar: redder points emit more low-frequency radio waves, while bluer points emit more high-frequency radio waves.

A clock appears in the top right corner of the screen and is ticking at a rate of once per second in the time-frame of the visualization.

**Artist bio:**
Laura Kogler is a graduate student in physics at UC Berkeley, where she works on a neutrino physics experiment located 1.4 kilometers underneath the tallest mountain in Italy. She delights in the intersection of art and technology, and has helped create large-scale interactive fire art with groups such as the Flaming Lotus Girls and Interpretive Arson.

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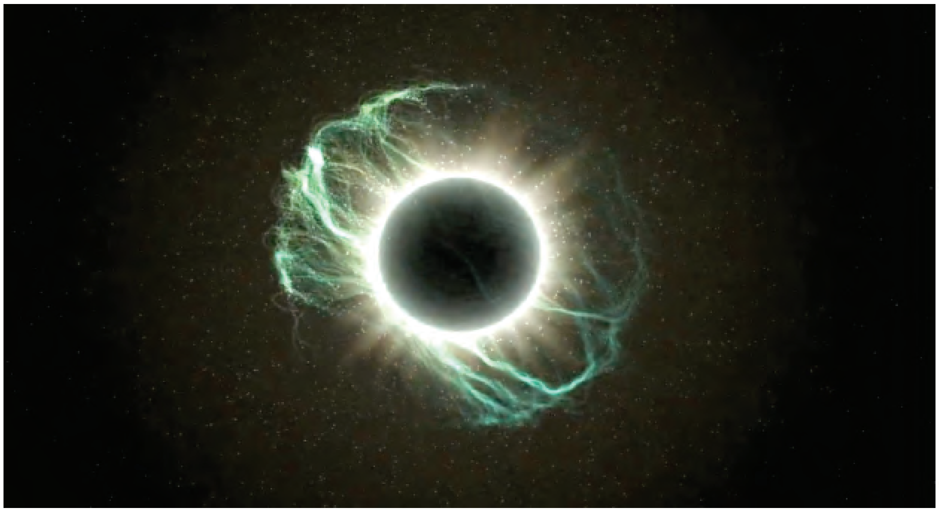

# SonicSENSE and GAFFTA Open-Call for Submissions

## Featured Artist: Eddie Lee

### Black Star

**Description: I've always been fascinated by the beauty of space. This piece draws inspiration from two concepts: the black hole and the neutron star. The black hole's gravity is so intense that not even light can escape. Its gravity absorbs nearby matter, causing the system to be perturbed from its dynamical equilibrium. The system must apply restoration force which causes the system to oscillate back and forth as it endeavors to reach an equilibrium state.**

**Real-time simulation coded in C++ using Cinder. All art is procedurally generated.**

### Digital Star

**Description: This piece is a stylized abstraction of a star undergoing nuclear fusion. Fusion reactions power the stars and produces all natural elements in the world, including the elements that make up the human body. The concept is brought into the digital realm by using cellular automata to procedurally generate the boxes. The bottom right module shows the current time in binary.**

**Real-time simulation that uses 3D cellular automata to generate the boxes. The circles on the bottom right represent the current time in binary. Heavily influenced by the work of Carl Detorres. I couldn't help but wonder how his IBM icon piece would appear in animated form.**

**Bio: Eddie Lee recently graduated from the Guildhall at SMU, where he received his Masters in Interactive Technology. He is currently employed as a game programmer at Q-Games (PixelJunk), located in Kyoto, Japan. He has a fascination in mending procedurally generated content with digital art and loves to see procedural algorithms manifest itself in innovative and artistic ways.**