



CCRMA  
Winter Concert  
2010

## PROGRAM

---

**Phoné** John Chowning

**The buildings are brighter than the stars** Diane Douglas

**Sea Songs Phasered** John Pierce & Max Mathews

**The Dinosaur at War 2** Net vs. Net Collective  
Juan Pablo Cáceres, Fernando Lopez-Lezcano, Alain Renaud

► intermission ◀

**Spin** Jakes Bejoy & Surabhi Saraf

**Edgar Robothands: Mechanical Looping** Edgar Berdahl

**kaltesklareswasser** Visda Goudarzi

**Seeds of Change** Jonathan Norton  
Mark Applebaum, Chris Chafe, Mark Goldstein, Rob Hamilton

---

## PROGRAM NOTES

**Phoné**

**John Chowning**

The sounds of Phoné (from the Greek, meaning “sound” or “voice”) were produced using a special configuration of the FM synthesis technique which allows the composer to simulate a wide range of timbres including the singing voice and other resonant sounds. The synthesis programs are designed to permit exploration of and control over the ambiguities which can arise in the perception and identification of the source sources. The interpolation between timbres and extension of “real” timbres into registers which could not possibly exist in the “real” world, the micro structural control of sound having to do with the fusion or segregation of spectral components are some of the points of departure for this composition. Chowning realized this piece in 1980-81. In this concert the original 4 channel piece will be diffused over all 16 speakers with virtual sources created using Ambisonics spatialization techniques.

**The Buildings are Brighter than the Stars (2010)**

**Diane Douglas**

The Buildings are Brighter Than The Stars is an improvisational piece for processed guitar, piano and a new kind of hybrid instrument called the Lattice Harp. Colin Raffel, Diane Douglas and Nick Kruge constructed this instrument at CCRMA during the fall of 2009. It is a grid of sixteen guitar strings; two planes of eight strings at right angles to each other. Whenever two strings touch, a circuit is completed and the onboard microcontroller treats this like a button being pressed. It also detects which two of the 16 strings were crossed, and sends this information in the form of X-Y coordinates to the laptop using OSC data. Each string has a piezo electric pick-up, so the Harp also sends 16 channels of audio data. This signal is being processed within Max/MSP by a bank of Phaser Filters (written by Max Mathews in C.) These filters create tuned resonances within the sound of the Harp. Max/MSP uses both the audio data and OSC data to play the filters in real time by fluctuating their cutoff frequencies within diatonic modes that fit the style of the piece and the tuning of the strings. This simulates a constantly morphing resonant space that could not possibly exist, but it gives the instrument a natural harmonic foundation.

For this piece, the vertical strings are tuned to B major while the horizontal strings provide harmonies at the second, third, fifth and sixth scale degrees. The X coordinate of each button press determines which diatonic mode of B major to use for tuning the filters, and the Y coordinate [1-8] picks a scale degree. Each of these triggered frequencies is stored in an expanding table. Then, at a tempo defined by the speed of the performer, the program picks note values from this table to send to one of the 50 Phaser Filters. Each filter is paired with a second one which is offset by small enough amounts to provide randomly varying vibrato, and each individual filter's decay time is also being randomly modulated so that not every harmonic sustains for the same amount of time. It is impossible to tell exactly which filter will decay quickly or slowly, or which filter will be tuned to what frequency at any given second. However, these variables were made somewhat chaotic to match the unpredictable nature of this instrument, and that makes it more exciting for improvisation.

Each section of the piece uses certain collections of audio loops triggered through Ableton Live. The overall structure is set in stone as well, but the length of each section is left open to leave room for the Harpist to improvise. The Harp is played with metal files because the player can achieve an accent with the metal tip and a dampened attack with the rubber handle. The Harp score consists short phrases that can be expanded during performance. There are two lines of rhythmic notation accompanied by grid diagrams inspired by guitar tablature. They show which coordinates to strike at which angle. Much of the piece sits ambiguously between B major and its relative minor so that it can sound joyful with an undertone of sadness. The title is meant to invoke images of the city skyline at night, and while that is beautiful, sometimes it is bright enough to overshadow the rest of the sky. Human beings have always tried to hide from nature to some degree, and while this disconnection can be thought of as sad, even urban decay has its own unique beauty. It is easy to forget that the stars are bigger and farther away than we can imagine when all we see are tiny pinpricks of light getting lost in our cities.

## **Sea Songs Phasered**

**John Pierce & Max Mathews**

Composed by John R. Pierce and Max Mathews - 1963 and 2010

Performed by Max Mathews

Movement 1: Original sound file

Movement 2: Phaser filtered sound file

In 1963 John Pierce wrote the piece "Sea Songs" and synthesized the piece at Bell Telephone Laboratories using my Music 3 program. He used the then new random-noise unit generator to make band-pass noises some with low frequency sounds and others with narrow band melodic sounds. In the 1980's at CCRMA Pierce made his version of the Bohlen-Pierce scale, a scale which has no octave but rather is based on a tritive (3:1) frequency ratio. Its chromatic 1/2 step is the 13th root of 3.

Sea Songs Phasered first movement is the original Pierce sound file. The second movement is the sound file filtered with a bank of 19 high Q phaser filters. The filters in the bank are tuned to the chromatic 1/2 steps of the Bohlen-Pierce scale. In the performance the sound file will be filtered in real-time on my MacBook Pro laptop. The entire filter bank will be transposed up or down Bohlen-Pierce chromatic 1/2 steps controlled from the computer keyboard. MM.

## **The Dinosaur at War 2**

**Net vs. Net Collective**

Juan Pablo Cáceres, Fernando Lopez-Lezcano, Alain Renaud

for Four Synthesizers, Two Locations (CCRMA and Bournemouth, England), and One Acoustic Network of Four Channels.

This piece is a structured improvisation that uses a transcontinental network connection and several analog synthesizers on both sides (old, new, real and virtual analog). On top of that, feedback and delays are explored through the network acoustic path, using a 4-channel Feedback Delay Network. This piece takes also inspiration in the original Lopez-Lezcano's "El

dinosaurio habla", for analog synth and superlooper. We use Jacktrip, SuperCollider, a lot of analog and digital circuits, and The Network.

► intermission ◀

**Spin**

**Jakes Bejoy & Surabhi Saraf**

Spin is an experiment in collaboration, combining live vocals, a pedestal fan and 6-channel spatialization. The piece is inspired by the movements of the rotating fan, panning from an Indian lullaby to electronic music in its progression.

**Edgar Robothands: Mechanical Looping**

**Edgar Berdahl**

Band of Percussion Robots

In 1963, Max Mathews wrote that any perceivable sound could be produced using digital sound synthesis. However, any perceivable sound can also be produced using mechanical sound synthesis: states of the digital sound synthesis algorithm can be implemented mechanically. In other words, some of the digital bits used by the algorithm can be represented by mechanical vibrating objects rather than purely electronic bits. Today implementing these mechanical connections is expensive, so in practice, we are limited to only a few points of mechanical/haptic interconnection.

In this piece, Edgar explores mechanical sound synthesis by employing robots to play physical percussion instruments. There are five points of mechanical interconnection. At the first four points, a shaker, egg, tambourine, and snare drum are played by "slave" robots. The fifth point is the "master" robot that Edgar holds in his hand. He can play any of the physical instruments by teleoperating it through the master robot with force feedback. During teleoperation, the trajectory of the master robot is recorded into wavetable loops in Max/MSP. At later times during the piece, these loops are played back, providing for mechanical synthesis with an especially human feel, even when the loops are played back irregularly or at superhuman speeds. The piece also incorporates the Haptic Drum, which is a feedback-controlled woofer connected to an Indian percussion instrument synthesizer.

**kaltesklareswasser**

**Visda Goudarzi**

At the start of the 21st century, the Earth is facing a serious water crisis. One out of every six people does not have access to potable water. While the average US citizen utilizes 250 liters of water per day (the average European - 104 liters,) people in Africa have access to less than 5 liters per day. The Seawater Desalination Project helps create safe, purified drinking water and "kaltesklareswasser" is a piece to simulate the procedure used as part of the project.

**Seeds of Change (2010)**

**Jonathan Norton**

Mark Applebaum, Chris Chafe, Mark Goldstein, Rob Hamilton

Seeds of Change is a multimedia composition program that is centered on an entirely improvisatory environment for instrumentalists. Performers enter into the program the number of players - from one to eight - and set the desired length of the piece from 10 to 65 minutes. The program uses these "seeds" as the basis to generate the graphics, the live and the recorded sound processes for the piece. All sounds germinate from the performers themselves. The algorithms in Seeds of Change are derived using confined stochastics so that the piece is discovered anew each time and never generated the same way twice. The piece can optionally be run in a graphic mode only without any electronics.

## ABOUT THE ARTISTS

**Mark Applebaum** is associate professor of music composition at Stanford University where he composes important music that improves culture and makes the world a far better place for humankind. He has received a lot of Pulitzer prizes, MacArthur genius grants, Nobel peace prizes, Olympic gold medals, citizenship awards, and parking citations. At present he is working on a means of channeling his ego into a sustainable, alternative energy source.

**Jakes Bejoy** is a composer, sound designer, performer and engineer who has scored and performed in several feature films, albums and jingles. He holds a graduate degree in Music Science and Technology from CCRMA. His music brings together elements of Indian classical music and experimental electronic music. Jakes's interests include spatial audio, headphone virtualization, frontend engineering, game audio development, music production, internet audio. His debut album "Malayalee" was the highest selling album in 2008 in the State of Kerala, India. He has released 5 music albums and "SRK" - a Warner Bros. distributed feature film has his most recent scoring credit. He has also worked at Activision Blizzard as a Sound Designer on titles such as Guitar Hero 5, Band Hero and others. At present he works at Mozzapp, building mobile and web applications for today's leading content companies. Occasionally, Jakes travels to LA to work as an independent composer/sound designer for independent studios/film makers.

**Edgar Berdahl** is a visiting scholar at CCRMA. He has been studying how force feedback can be incorporated into the design of novel musical instruments.

**Juan-Pablo Caceres** is a composer, performer and engineer born in Santiago, Chile. He is currently a PhD student in computer music at CCRMA, Stanford University. His work includes instrumental and electronic pieces, as well as performance of avant-garde rock music, with a albums edited in Europe and America. Juan-Pablo's interests include Internet music and performance, virtual acoustic spaces, popular experimental music, boundary pushing computer music (in both directions).

**Chris Chafe** is a composer, improviser, cellist, and music researcher with an interest in computer music composition and interactive performance. He has been a long-term denizen of the Center for Computer Research in Music and Acoustics where he directs the center and teaches computer music courses. Three earlier year-long research periods were spent at IRCAM, Paris, and The Banff Center, composing and developing methods for computer sound synthesis. He is continuing the SoundWIRE experiments for musical collaboration over the Internet. An active performer, he has performed in Europe, the Americas and Asia. Discs of his works are available from Centaur Records. In the past year he has performed with Roberto Morales, Simon Rose, Pauline Oliveros, Roscoe Mitchell, Mark Dresser, and Dave Douglas, among others. A sound installation, The End of Winter, was recently featured at the Pasadena Museum of California Art. His doctorate in music composition was completed at Stanford in 1983.

**John Chowning Osgood Hooker Professor of Fine Arts, Emeritus. B.M.**, Wittenberg University, D.M.A., Stanford University, Studies with Nadia Boulanger, Paris, 1959-62. Fields: computer music, composition, auditory/music perception. Patents: The Simulation of Moving Sound Sources, The Synthesis of Complex Audio Spectra by Means of Frequency Modulation. Publications, Recordings: Journal of the Audio Engineering Society, Schott / WERGO. Grants, Awards: artist-in-residence, Künstlerprogramm des Deutschen Akademischen Austauschdiensts, Berlin, 1974; invited composer/researcher IRCAM, Paris, 1978, 1985; Fellow, American Academy of Arts and Sciences, 1988; Honorary Doctor of Music, Wittenberg University, 1990; Dipl. Atme d'Officier dans l'Ordre des Arts et Lettres, French Ministre de la Culture, 1995; Doctorat Honoris Causa, Universit. Ai de la Mediterranie, Marseille, 2002.

**Diane Douglas** was born in Vancouver, BC in Canada in 1986. She began studying piano at age 4 and as she grew, so did her love for mathematics. But a passion for music took over when she began playing guitar in a band and writing songs at age 13. It wasn't until she discovered sound design and electronic music at Berklee College of Music that she rediscovered the beauty of mathematics and started combining it with music. She currently resides in Berkeley, CA working for Keith McMillen Instruments and hopes to go to graduate school to continue studying instrument design and performance.

**Mark Goldstein** is a San Francisco-based percussionist who performs in a wide variety of styles. He is a graduate of The Johns Hopkins University, The Peabody Conservatory of Music, and Stanford, where he studied and performed at CCRMA. Mark is also a software developer specializing in music and audio applications and has worked for Sony, Studer, Gibson Guitar, CNMAT, IRCAM, Interval Research and Buchla Associates. He was part of the team that developed the Marimba Lumina and frequently performs live electronic accompaniments for silent movies using Buchla Lightning Wands, in collaboration with the organist Dennis James.

**Visda Goudarzi** is a computer musician interested in research in software for computer music, human-computer interaction, gesture-based interfaces, computer graphics, sonification, sound synthesis, and the application of new media in art. She is currently a researcher at Stanford working on an audio-visual feedback device in the Department of Oncology. She received her MA in Music, Science, and Technology at CCRMA in 2009. She also holds an MS in Computer Science from the Vienna University of Technology in Vienna, Austria, which she earned in 2008. Visda began her studies at the Sharif University of Technology in Tehran before relocating to Vienna in 1998

**Robert Hamilton** is actively engaged in the composition and performance of contemporary electroacoustic musics as well as the development of interactive musical systems for performance and composition and is currently pursuing his Ph.D. at CCRMA working with Chris Chafe.

**Max Mathews** is a pioneer in the world of computer music. He studied electrical engineering at the California Institute of Technology and the Massachusetts Institute of Technology, receiving a Sc.D. in 1954. Working at Bell Labs, Mathews wrote MUSIC, the first widely-used program for sound generation, in 1957. For the rest of the century, he continued as a leader in digital audio research, synthesis, and human-computer interaction as it pertains to music performance. We are very fortunate to have him at CCRMA.

The scope of **Jonathan Norton's** compositions encompasses all manner of creative forms, from lush melodic acoustic counterpoint to pulsating electronic figures, to provocative, otherworldly computer music landscapes that move the listener on both visceral and intellectual planes alike. His works for dance, chamber music, computer music and soundtracks have been heard and performed worldwide in festivals and on television in the United States, Russia, Spain, Germany, South Africa, the Netherlands, Brazil, Japan, Monaco, Italy, China, Hong Kong, France and Switzerland. Jonathan has

been commissioned by and collaborated with such choreographers as Robert Moses, Amy Seiwert, Erin Mei-Ling Stuart, Willy Tsao and the Guangdong Modern Dance Company on projects that premiered in San Francisco, Chicago, London and Hong Kong. At the Ars Electronica Festival in Linz, Austria he was a featured lecturer speaking on computer music and several of his compositions were highlighted and discussed in a live radio broadcast on the German radio station Bayern 4 Klassik. He attained a Ph.D. in Computer-Based Music Theory from the Center for Computer Research in Music and Acoustics (CCRMA) at Stanford University and received his Master's degree in Composition from Northwestern University.

**Fernando Lopez-Lezcano** is a composer, performer, lecturer and computer systems administrator at CCRMA. He has been teaching and taking care of computing resources there since 1993, and created and maintains since 2001 the Planet CCRMA collection of open source sound and music packages for Linux. He has been involved in the field of electronic music since 1976 as a composer and performer, blurring the lines of his dual background in music (piano and composition) and electronic engineering. His music has been released on CD and played in the Americas, Europe and East Asia. He taught at Keio University in Japan in 1992 and was the "Edgar Varese Guest Professor" at TU Berlin during the Summer 2008 semester.

**John Pierce** (1910 – 2002), was an American engineer and author. He worked extensively in the fields of radio communication, microwave technology, computer music, psychoacoustics, and science fiction. Born in Des Moines, Iowa, he earned his Ph.D. from Caltech, and passed away in Sunnyvale, California.

**Alain Renaud** was born in Geneva, Switzerland. After spending several years there, he moved to California in 1997 to study audio engineering and music business. He moved to London in 2001 to take on a job with digital strategy consultancy, Rightscom and pursued an Msc in Music Information Technology at City University. In 2005, he moved to Belfast, in Northern Ireland to join the Sonic Arts Research Centre (SARC). His current research work focuses on networked audio technologies. He is also working on several projects including an open source music initiative, Go4Music. In late 2008, he joined Bournemouth University as a lecturer in music and audio technology with research focusing on the use of artwork over high-speed networks.

**Surabhi** is a new media artist whose work brings together elements from experimental sound art, classical music, choreography and video art. She graduated from the School of the Art Institute of Chicago in 2009 with an MFA in Art and Technology. Prior to that, she obtained her BFA in Painting from MSU Baroda (India) in 2005. Surabhi is the winner of Art vs Design (2009) organized by Artists Wanted, New York and presented her work at the announcement reception at the New Museum, NY. Her work PEEL is the Winner of Celeste Prize (2009), Italy and was exhibited at Alte AEG Fabrik, Berlin. Surabhi's collaborative work with Nadav Assor, was presented at the NETMAGE 10 International Live Media Festival, Bologna, Italy. Her video Peel was also shown at the 13 International Video Festival, at the Museum of Contemporary Art, Vojvodina, Serbia. Surabhi is the recipient of the International Graduate Student Scholarship at the School of the Art Institute of Chicago. Her solo and collaborative works have been presented at the Links Hall, Looptopia and Sullivan Galleries in Chicago. She has shown at the Vadehra Art Gallery in New Delhi and was a part of Peers student residency program at Khoj International Artist Association New Delhi in 2006. Surabhi currently lives and works in San Francisco.

---

No food, drink or smoking is permitted in the building.  
Cameras and other recording equipment are prohibited.  
Please ensure that your pager, cellular phone and watch alarm are turned off.

<http://ccrma.stanford.edu/concerts/>

---