

# EMPAC

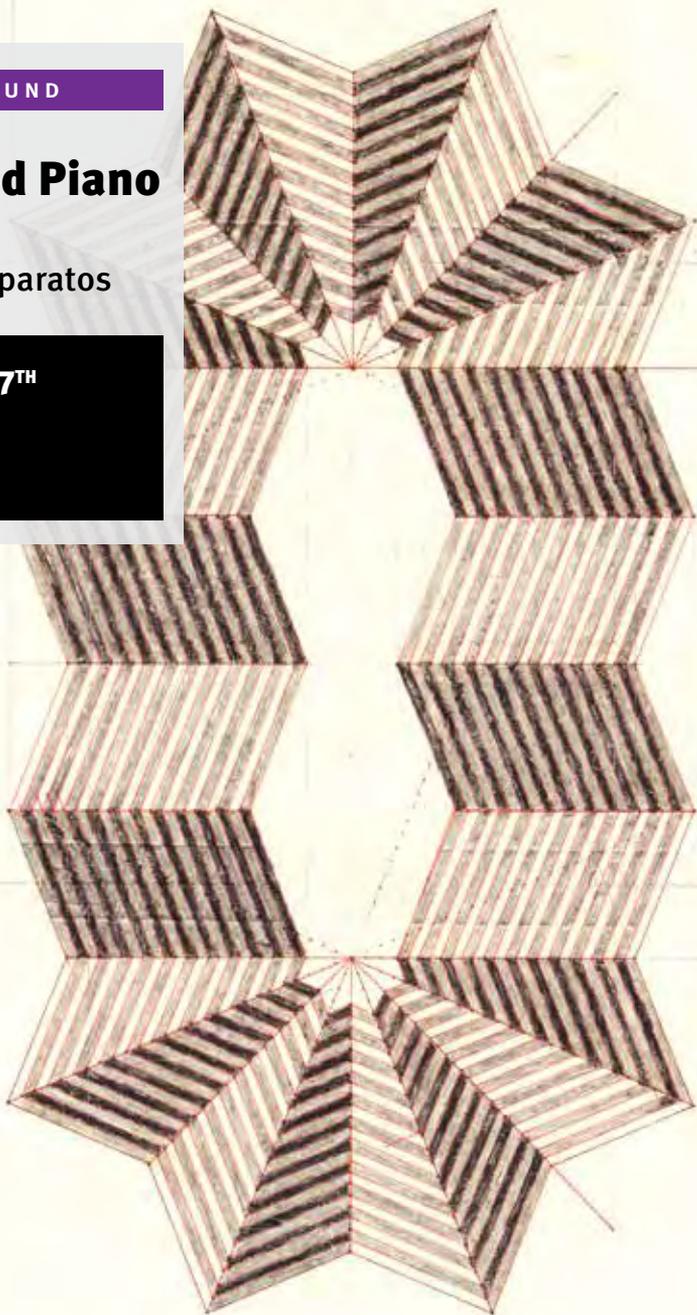
MUSIC / SOUND

## Expanded Piano

Stavros Gasparatos

FRI / NOV 07<sup>TH</sup>

8:00 PM



## Stavros Gasparatos

### Expanded Piano

Imagine being inside a piano. Imagine the piano expanded to the size of a concert hall. This EMPAC-commissioned concert and installation is grounded in the idea of “prepared piano,” a tradition where screws, rubbers, bolts, etc., are attached to the strings inside a piano, altering the sound. Building on the many famous mechanically prepared piano compositions from John Cage to Aphex Twin, *Expanded Piano* transforms the idea into a uniquely electronic form. An acoustic piano is wired with both regular microphones and contact microphones attached to the body of the piano, its strings, and mechanisms. Each microphone’s signal is manipulated in real time through a computer and then routed to its own loudspeaker, creating a multichannel space around the audience that puts the listeners “inside” the piano.

Stavros Gasparatos is a composer and digital sound artist who lives and works in Athens, Greece. He composes music for dance, theater, and cinema, and frequently works on solo music projects. His music has been performed in all major Greek theaters and concert venues, including the ancient Epidaurus Theatre, the Onassis Cultural Centre, and the Megaron Mousikis Concert Hall. His work has been performed internationally in London, Macao, Naples, Berlin, Toronto, Amsterdam, Paris, and Sofia. Gasparatos is a frequent collaborator of the National Greek Theatre. He has composed music for over 90 productions and is considered one of the most important composers of the new Greek wave.

## The Expanded Piano Context

John Mourjopoulos

*Professor of Audio & Acoustic Technology Group, University of Patras, Greece*

Piano has always been the instrument of extreme musical flexibility, capable of delivering simple songs or complex polyphonic music performances over eight octaves and a wide range of dynamics. Throughout the past centuries, the piano has been also continuously reinvented as an instrument allowing extreme stylistic explorations—of frequencies and pitch, of dynamics and harmonies, of rhythms and articulations—also as an instrument for controlled musical expressiveness through a wide variety of playing techniques: from fast, percussive, staccato arpeggios to slow, sustained, lush chords.

One of the most radical reinventions of piano during the 20th century has occurred through the “prepared” piano pieces of John Cage in the late ’30s, works that created a novel canvas for polyrhythms and percussive timbres. Here this traditional instrument emerged as a new source for the experimental music of the ’60s and subsequently, during the next decades, bridged these experiments to past and emerging pianistic traditions as the hybrid sonic vehicle for many of today’s significant music works.

In a parallel development, the 20th century’s evolution of recording technology has modified our listening perspective of piano sounds. It is by now customary to hear piano reproduced through audio systems, away from its natural acoustic habitat of a concert hall. Within the recording medium, it is likely to appreciate soft, pianistic tingling notes hidden somewhere within a dense rock or jazz production, usually at the far left of the stereo field. In other cases, we come across the immense aural size of a good solo piano recording, likely extending the stereo perspective and utilizing the full frequency and dynamic range of our audio equipment. Such technological background has progressively shifted our collective hearing percept of piano sound away from the dimension of natural, acoustic listening and into the domain of virtual, electronic-acoustic space. Through the recording medium, piano has been transformed within our subconsciousness into an instrument of immense aural and aesthetic possibilities.

The performance “Expanded Piano,” by the composer Stavros Gasparatos, pays homage to this ever-evolving aesthetic character of the instrument. Here the spectral and spatial piano properties are not merely extended via stylistic or recording and postproduction means. Instead, these aspects are expanded into the real physical space so that the listeners are immersed within a virtual new instrument, whose aural size is only bounded by the extremities of the concert hall. This is now the piano heard through a sonic magnifying glass so that the listener embarks into an *Alice in Wonderland*-like acoustic journey.



# STAFF

## The Expanded Piano Project

John Mourjopoulos

In essence, piano is a percussive instrument that transforms hammer activations into string vibrations, sympathetic coupling, inharmonicity and rich resonances of interconnected, mechanical, vibrating components, each having individual properties, which finally generate an elaborate acoustical radiation through the soundboard. The individual responses, especially those of the soundboard can be thus seen as filters shaping the timbre of the sound generated by the vibrating strings. The properties (responses) of these filters can be also measured via suitable excitation and recording. Such “piano filter” responses can be modeled with computer programs and constitute one element of the present piece by Gasparatos. Along with this, the technical concept of the expanding piano piece relies on the following elements:

The acoustic capturing of the piano sound via multiple microphones in different positions along its soundboard and strings.

The direct capturing of soundboard vibrations through contact microphones.

The triggering of electronic sounds from the normal playing action on the piano keyboard.

The filtering and shaping of the direct piano sounds picked up by the diverse microphones through the programmed piano response filters.

The acoustic projection into the space of the concert hall (“spatialization”) of these individual sound elements, through their dynamic distribution to 24 loudspeakers arranged at two different height levels. The allocation of sound to loudspeakers above the heads of the audience offers an increased listener immersion, which is an emerging feature of current cinematic audio technology offered in selected movie theaters.

The performer-composer navigates through preselected “scenes,” which consist of a set of parameters for all these options and combinations, ultimately triggered by his playing action.

These technical extensions of the piano sound, on the one hand, magnify, reinforce and expand the instrument’s natural timbral features; on the other hand, these sounds are filtered through the “piano filters” and radiated through the loudspeakers encircling the audience, spatially immersing the listener into otherwise-unheard sonic details and combinations: a true reinvention of the piano.

Johannes Goebel / Director  
Geoff Abbas / Director for Stage Technologies  
Eric Ameres / Senior Research Engineer  
S. Argeo Ascani / Curator, Music  
David Bebb / Senior System Administrator  
Peter Bellamy / Senior Systems Programmer  
Michael Bello / Video Engineer  
Victoria Brooks / Curator, Time-Based Visual Arts  
Eric Brucker / Lead Video Engineer  
Ash Bulayev / Curator, Dance + Theater  
Michele Cassaro / Guest Services Coordinator  
John Cook / Box Office Manager  
Roxanne DeHamel / Web Developer  
David DeLaRosa / Production Technician  
Zhenelle Falk / Artist Services Administrator  
William Fritz / Master Carpenter  
Kimberly Gardner / Manager, Administrative Operations  
Ian Hamelin / Project Manager  
Katie Hammon / Administrative Specialist  
Ryan Jenkins / Event Technician  
Shannon Johnson / Design Director  
Pamela Keenan / Production Technician  
Cathylo Kile / Business Manager  
Eileen Krywinski / Graphic Designer  
Carl Lewandowski / Production Technician  
Eric Chi-Yeh Lin / Lead Stage Technician  
Stephen McLaughlin / Event Technician  
Josh Potter / Marketing and Communications Manager  
Alena Samoray / Production Technician  
Candice Sherman / Business Coordinator  
Avery Stempel / Front of House Manager  
Kim Strosahl / Acting Production Administrative Coordinator  
Jeffrey Svatek / Audio Engineer  
Dan Swalec / Master Electrician  
Todd Vos / Lead Audio Engineer  
Pete Wargo / Manager, Information Systems  
Michael Wells / Production Technician  
Emily Zimmerman / Associate Curator



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# EMPAC

## Upcoming Events

An updated schedule for the 2014 Fall season is available online at [empac.rpi.edu](http://empac.rpi.edu). Check back often for more information.



### WORKSHOP

#### **LAURIE ANDERSON**

Tai Chi, Meditation, and Making Art

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Wednesday, November 12 / 6:30 + 8:30 PM



### FILM / VIDEO

#### **LEVIATHAN**

Lucien Castaing-Taylor,  
Ernst Karel, + Véréna Paravel

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Thursday, November 13 / 7:00 PM

\$6



### MUSIC / SOUND

#### **JACQUELINE KIYOMI GORDON**

The Only Thing that Makes Life Possible  
is Not Knowing What Comes Next

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Friday, November 14 / 7:00 PM

FREE