The Center for 21st Century Studies (C21) at the University of Wisconsin–Milwaukee leads the way in imagining, defining, and creating the burgeoning field of 21st century studies, focusing on the intersection of the humanities, arts, and sciences (social and natural) with issues of compelling concern. The Center organizes its research and public programs around themes that change periodically. Each year the Center constitutes a group of six to eight UWM faculty fellows whose research interests relate to the theme. Nationally and internationally known scholars are brought to campus to address the topic of the year's research in seminars, lectures, and conferences.

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a conference on distance and interaction in music
university of wisconsin–milwaukee

FRI 02/18/2011

curated by Matthew Burtner
produced by Center for 21st Century Studies
with CCRMA/Stanford • UVA/Charlottesville • IUPUI/Indianapolis • UMKC/Kansas City

co-sponsored by Unruly Music, Peck School of the Arts
C21 Welcome + Introduction
Richard Grusin • Director of C21

Introduction to [Ø] [zerospace]
Matthew Burtner • Provost Fellow of C21

Introduction to NOMADS
(Network-Operational Mobile Applied Digital System)
Interactive Media Research Group (IMRG) • University of Virginia
Matthew Burtner, Steven Kemper, and David Topper
“Unity Groove” NOMADS Audience Performance
navigate browser to http://www.nomads.music.virginia.edu

Network Music for Social Networks
Chris Chafe • Stanford University
Center for Computer Research in Music and Acoustics (CCRMA)

Performance Beyond Place: Reflections on Telematic Art
Scott Deal • Indiana University Purdue University Indianapolis (IUPUI)
Donald Tavel Arts Technology Research Center

Questions + Discussion
moderated by Christopher Burns • University of Wisconsin–Milwaukee
Unruly Music, Peck School for the Arts

Kirkpatrick, Betty Liang, Nicholas Mason, and Jamie Searle.

David Topper has been the Technical Director for the Virginia Center for Computer Music since 1997. His research has focused on topics ranging from real time synthesis and video processing systems, multichannel audio, wireless sensor arrays, single board computers, graphical user interfaces, and Java-based network performance applications. Other work has centered around helping build up the VCCM’s physical space, resources, and community. Topper has also been a supporter and contributor to the Open Source Software movement since the early 1990s.

SPECIAL THANKS
Center for 21st Century Studies would like to offer deep thanks to LSITO and UITS for their exceptional work. In particular, we thank Adam Zembrosky and Steven Lange. In house, C21 thanks the newest member of its team Mike Darnell for coordinating all of the complex technical and digital aspects of the day’s events.
annual meeting of the Deutsche Gesellschaft für Musiktheorie. Upcoming engagements will take him across much of the southern USA, as well as back to Canada, in a variety of solo and chamber music settings.

**MICE**
The word “mouse” derives from “muse.” The mouse is the friend of writers, artists, and musicians, the little voice serving as a source of inspiration. The MICE (Mobile Interactive Computer Ensemble) turn musing into a collective interaction by composing, programming, and performing mobile multi-performer human-computer music.

MICE began performing at UVA in 2001. Matthew Burtner created the group to explore a genre of multi-performer interactive music systems with a precedent in the work of Stockhausen (Germany, 1960s), The Hub (California, 1980s), and Sensorband (Netherlands, 1990s). MICE extends this genre of human-computer ensemble interaction by developing network technologies and artificial intelligence systems for performance with innovative gestural controllers. Since 2001 MICE has performed at venues such as the University of Washington, Charlottesville Fringe Festival, The IX Building, Digitalis Under the Stars, Symphony Space, The DCCA, University of Delaware, MUSE, Old Cabell Hall, and the Most Significant Bytes Festival. Papers for the NIME and ICMC conferences describe the MICE approach of the early 2000s. In 2008 the group expanded into an orchestral scale and has performed at Digitalis with Matmos. Modeled on LAN-party gaming infrastructure, “MICetro” makes emergent music out of massive data generation employing up to 500 performers.

In 2009, while traveling 30,000 miles by ship around the world on the M/V Explorer, MICE performed an ambitious series of concerts engaging with diverse environments and cultures of the world. The album *MICE World Tour* was listed among the top 10 records of 2009 by The WIRE’s Susanna Glaser.

**MiLO**
is the Milwaukee Laptop Orchestra. Organized by Christopher Burns, MiLO is a collective of musicians and artists dedicated to live audio/visual performance. Performances consist of free improvisations as well as works from the repertoire of electronic music. MiLO also makes use of custom software to enable networking between laptops during performance. Some members perform using acoustic instruments, some using electronics, and some produce live video and animation.

**Chryssie Nanou** is active as a performer, lecturer, and teacher of piano performance, music technology, and contemporary performance practice. Born in Greece, her personal and professional aesthetics were formed in Paris with her studies at the École Normale de Musique de Paris/Alfred Cortot, and further shaped in the United States with her studies at The Peabody Institute of Johns Hopkins University, and her work at the Stanford University’s CCRMA. As a solo artist, chamber musician, and lecturer, Nanou has given performances and lectures around the globe giving special emphasis to the performance practices necessary to perform today’s acoustic and electro-acoustic contemporary music.

**RAT** (Radical Arts Technology) is an ensemble created for the University of Missouri Kansas City (UMKC) by Guest Composer, Matthew Burtner. RAT embraces concepts such as “the unfamiliar,” “the remote,” “human-machine-environment interaction,” and “the lost” as compositional modalities. In its first season the ensemble includes Matthew Burtner, Director; Andrew Cole, Assistant Director; and members Scott Blasco, Brad Baumgardner, John Chittum, Jared Thomasino, David King, James
**Deconstructions No. 4 (2011)**
duration: 6’30”

*Deconstructions* is a series of improvisatory variations that explores the compositional possibilities of manipulating contextual and associative properties of various sonic objects. Each piece in the series is constructed from several brief audio snapshots of a particular sonic object or environment. These audio snapshots are digitally "deconstructed" in real-time as a performance. As a result, an array of gestures draw out and transform salient characteristics inherent in the original source. Often the sound sources chosen project an inner referential or nostalgic quality — composer Stefan Wolpe described this as the "haunted" nature of an object. As objects are deconstructed, their original contextual identity becomes obscured or even destroyed; however, the process of abstraction can act as a filter, removing surface characteristics to reveal latent qualities about the objects' true nature. When these qualities are illuminated, unexpected narrative directions take shape. This performance of *Deconstructions No. 4* is a special arrangement created for zerospace that combines live processing of percussion timbres and audio/video environments between artists in Milwaukee and Indianapolis.

**MiLO: Improvisation (2010)**
duration: 12’

Improvisation is the central practice of MiLO; it informs nearly everything that we do. We relish the challenges of improvisation—both surprising and supporting one another, and intermingling our individual aesthetics into a collective vision.

**Shadows No. 5 (2009)**
duration: 5’

*Shadows No. 5*, by Aurie Hsu and Steven Kemper, is a piece for belly dancing, RAKS (Remote electroAcoustic Kinesthetic Sensing) system, and computer-generated sound. The movement vocabulary is derivative of Raqs al-Sharqi, commonly known as Middle Eastern dance. This dance form involves sinuous, languid movement, and controlled isolations. The piece begins with a zils (finger cymbals) solo, where each motion triggers a percussive sound. In the performance, sensors translate the dancer’s movements into subtle and salient variations of the sonic texture including filtering, delay, playback speed, and harmonization. The work experiments with notions of choreographic and musical gesture in the performance of electroacoustic music.

**RAT vs MICE (2011)**
duration: 7’

Interactive performance through NOMADS using “Swarm Synth” and “Sound Mosaic” with Radical Arts Technology/RAT (UMKC) and Mobile Interactive Computer Ensemble/MICE (UVA) and NOMADS by the IMRG.

Matthew Burtner, director; featuring RAT performers John Chittum, Andrew Cole, David King, James Kirkpatrick, Betty Liang, Nicholas Mason, Stamos Martin, and RAT performers John Chittum, Andrew Cole, David King, James Kirkpatrick, Betty Liang, Nicholas Mason, Stamos Martin, and Canadian pianist John Mayhood has performed as soloist and chamber musician in virtually every major North American city, as well as in Germany and Austria. He has appeared frequently on CBC/SRC radio as well as on various NPR affiliates, and his performances have been televised in both the USA and Canada. In constant demand as a collaborator, Mayhood has appeared with musicians from the Montreal and Toronto Symphonies, the New York Philharmonic, and the National Arts Centre Orchestra, among many others, and in duet with pianist Jean Desmarais. As a scholar, he has presented on subjects ranging from the philosophy of performance practice to neo-Riemannian theory at, among other places, the University of Chicago and the
of Art to create *Cabinet of Dreams*, a VR experience of Chinese antiquities. She has just returned from China where she exhibited her latest piece *Emotable Portraits*. She co-produced and designed interactive video for the American Opera Theater’s production *Annunciation + Visitation: Operatic projections of her sexual insight*. Her recent work involves digital projections for opera and experimental film. Her research focuses on how digital art provokes shifts in perception and enhances sensory awareness. Website: [http://dolinsky.fa.indiana.edu/](http://dolinsky.fa.indiana.edu/)

**Michael Drews** is a composer of contemporary acoustic and electronic music and is Assistant Professor of Music at Indiana University-Indianapolis (IUPUI). His music explores unconventional narrative strategies and the use of interactive music technology to expand traditional ideas of musical performance and creativity. Drews’ compositions have been performed in Europe, South America, and throughout the United States. “Broken Symmetry” for oboe, piano, and electronic music was commissioned as part of the 2003 ASCAP/SEAMUS Commission Award, and his recent works, “Transcendence I and II,” were commissioned as part of a music therapy study of guided-breathing practices (2008). Drews holds degrees from the University of Illinois at Urbana-Champaign (D.M.A.), Cleveland State University (M.MUS.), and Kent State University (B.A.).

**Aurie Hsu** is a composer, pianist, and belly dancer. She composes acoustic, electroacoustic, and interactive music; performs her own prepared/extended piano music; and collaborates often with musicians, choreographers, and designers of musical robots. She is a Ph.D. candidate in the Composition and Computer Technologies program at the University of Virginia where she has studied with Judith Shatin, Matthew Burtner, and Ted Coffey. Hsu holds degrees in piano performance from Oberlin Conservatory (BM) and Mills College (MFA). She also completed a degree in Electronic Music and Recording Media from Mills College (MFA). Hsu’s works have been performed by the Da Capo Chamber Players, Relâche, NOW ensemble, and the Talujon Percussion Quartet. Her works have been presented around the U.S. at ICMC, SEAMUS, SIGCHI, the SCI National Student Conference, Pixelerations, Third Practice Festival, and abroad at the Logos Tetrahedron Concert Hall (Belgium) and the Cite International des Arts (France). In 2010, Hsu won the International Computer Music Association (ICMA) Student Award for Best Submission for “Shadows No. 5,” part of a collaborative series of pieces with composer Steven Kemper. Current composition projects include a viola da gamba quartet, a suite for extended piano and electronics, and a second piece for belly dancer, RAKS system, and musical robots. Hsu dances with Fire in the Belly Dance Co., the only professional moderntribal belly dance company in central Virginia, and is the director of the World and Experimental Arts Group (WeArts), an organization that promotes cultural and experimental arts in Charlottesville, Virginia.

**IMRG** (Interactive Media Research Group) develops new technologies for artistic engagements and actions in the creative and academic spheres. Projects include new software development, robotics, human-computer interface hardware, and network applications. Recent members and collaborators come from the interdisciplinary fields of computer music, engineering, mathematics, statistics, architecture and computer science. The current core developers include Matthew Burtner, David Topper, and Steven Kemper.

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**Iceprints** (2010)

**duration:** 25’

The unprecedented melting of ice in the polar ice cap in the Arctic is a primary means of measuring the affects of climate change on Earth. The composition “Iceprints” for three telematic pianos and Arctic sub-ice ecoacoustics uses scientific data measuring 40 years of polar ice change in the Arctic Ocean. It merges these data sets with real-time audio recordings of sub-ice conditions taken during the melting season. Burtner’s unique compositional system devised for “Iceprints” simultaneously sonifies Arctic ice change over decades, annual seasonal cycles, and in real-time.

Hydrophones suspended beneath the Arctic ice captured the real time sound of ice melting. The hydrophones, positioned in a triangular formation over an area greater than 1 kilometer, allowed us to triangulate the position of events under the ice. It is a technique used by scientists to track the movement of underwater animals and by the military to track the movement of submarines. In *Iceprints*, the three-channel ice recording is sent through a specially-designed harmonic filter. That processed recording is played back on a three-channel surround sound system such that each loudspeaker corresponds to an hydrophone. The audience, situated virtually underneath the ice, now becomes part of the unfolding ecosystem.

Each page of the piano score represents one year of ice extent (sum total of ice) change in the Arctic according to the following chart. This graph was created by the composer using published scientific data (satellite and pre-satellite measurements of ice extent). The X axis shows the total sum presence of ice measured in millions of kilometers mapped onto the first six octaves of the piano. The Y axis shows time, mapped onto pages of music. The black line running between the two outer lines shows the average ice extent change compensating for seasonal cycles. This graph thus reveals a strong melting trend in Arctic ice over the past 40 years.

The piano score presents a transcription of one of the hydrophone’s real time sound recording, mapped into the tonal system of ice melting across 40 years. The pianos are set in a distance triangular relationship in three distinct spaces and connected with telematics. The triangulation of the material sound surrounding the
audience is mirrored by the conceptual distance triangulation of the pianists. The telematics reveal how we are intimately connected but also separate from these dramatic changes of our planet. The audience perceives the remote pianos through the delays, glitches and compression artifacts of network sound. These sounds of separation, introduced by the medium, evoke distance. We are continuously pulled to the other locations and simultaneously to the Arctic sub-ice world of cracking and thumping ice, whale and seal calls. “Iceprints” uses telematics to evoke a complex paradox: individuals are distant and separate from some real effects of our actions and from things that affect us; we cannot escape our physical or temporal context and yet we are constantly affecting and affected by things that are not present spatially or temporally. “Iceprints” collapses and folds time and space to illustrate this concept.

The composer is grateful to ice scientist and Geophysical Institute Professor Hajo Eicken for his guidance and collaboration on the mapping system and data sets used in “Iceprints.”

Siren Cloud (2010)
duration: 10'

Based on Chris Chafe and Greg Niemeyer’s collaborative web project at http://www.blackcloud.org/, this piece develops “live” music from breath rhythms. Sensor data drives the piece by sampling and “musicifying” the CO2 level. Tonight’s version couples two “breathers” in the remote space with audience instructions to inhale/exhale and drive musical processes. The piano part will be performed by Chryssie Nanou.

Ester Parade (2008)
duration: 3’30”

“Ester Parade” is a march (of sorts) that brings focus to the interaction between acoustic and electronic musicians. Composed for the ensemble Big Robot, the work employs disparate rhythmic samples, played around, but never on a simple 4/4 meter. The juxtaposition of irregular-regular pulsations among sampled, live, and electronic sounds creates an aura of chaotic animation, movement, and celebration. The inspiration for the music stems from the composer’s experiences attending July 4th festivities in the hamlet of Ester, Alaska.

BIOGRAPHIES (in alphabetical order)

Matthew Burtner (www.burtner.net) is an Alaskan composer and sound artist specializing in concert music and interactive media. His work explores ecoacoustics, (dis)embodiment, and extended polyrhythmic and noise-based systems. First prize winner of the Musica Nova International Electroacoustic Music Competition (Czech Republic), his music has also received honors and awards from Bourges (France), Gaudeamus (Netherlands), Darmstadt (Germany), Meet the Composer (USA), ASCAP (USA), Luigi Russolo (Italy), and Hultgren Biennial Competition (USA).

Burtner’s music, often combining acoustic instruments and new technologies with video, dance, or theatre, has been performed in major festivals and venues throughout the world. He is the composer of three multimedia operas — Ukiug Tulugaq (Winter Raven) (2002), Kuik (2006), and Auksalaq (2010). Among published recordings for DACO (Germany), The WIRE (UK), MIT Press (US), Innova (US), ICMA (US), Centaur (US), EcoSono (US) and Euridice (Norway), his music appears on three critically acclaimed solo recordings: “Portals of Distortion,” “Metasaxophone Colossus,” and “Signal Ruins.”

A 2009 Howard Foundation Fellow of Brown University, and the 2010/2011 Provost Fellow at UWM’s Center for 21st Century Studies, Burtner has conducted major artist residencies at IRCAM/Centre Pompidou (France), the Banff Centre for the Arts (Canada), Phonos Foundation/Pompeu Fabra Universitat (Spain), Musikene (Spain), Cité des Arts (France), and The University of Missouri Kansas City (USA). He studied composition, computer music, and music technology at St. Johns College, Tulane University (BFA, summa cum laude), Iannis Xenakis’s UPIC-Studios, the Peabody Conservatory/Johns Hopkins (MM), and Stanford University/CRCMA (DMA). Since 2001 he has taught at the University of Virginia where he is Associate Professor with tenure, Director of the Interactive Media Research Group (IMRG), and Associate Director of the VCCM Computer Music Center.

Chris Chafe is a composer, improvisor, cellist, and music researcher with an interest in computers and interactive performance. He has been a long-term denizen of the Center for Computer Research in Music and Acoustics where he is the Center’s director and teaches computer music courses. Three year-long periods have been spent at IRCAM, Paris, and The Banff Centre making music and developing methods for computer sound synthesis. The SoundWIRE project launched in 2000 involves real-time Internet concertizing with collaborators the world over. New tools for playing music together and research into latency factors continue to evolve. An active performer both on the net or physically present, his music is heard in Europe, the Americas, and Asia. The five countries’ Resonations concert was hosted by the United Nations in November 2009. CDs of works are available from Centaur Records. Gallery and museum music installations are continuing into their second decade with biological, medical, and environmental “musifications” featured as the result of collaborations with artists, scientists, and MDs. Upcoming new works include TQ11 “tomato quintet” for the transLife:media Festival at the National Art Museum of China.

Margaret Dolinsky is an Associate Professor at the Hope School of Fine Arts and Research Scientist with the Pervasive Technology Institute at Indiana University, Bloomington. She has been working in virtual reality since 1995, creating interactive art experiences that have been exhibited at SIGGRAPH, Ars Electronica, ICC in Tokyo, and the Walker Art Center. She was commissioned by the Indianapolis Museum