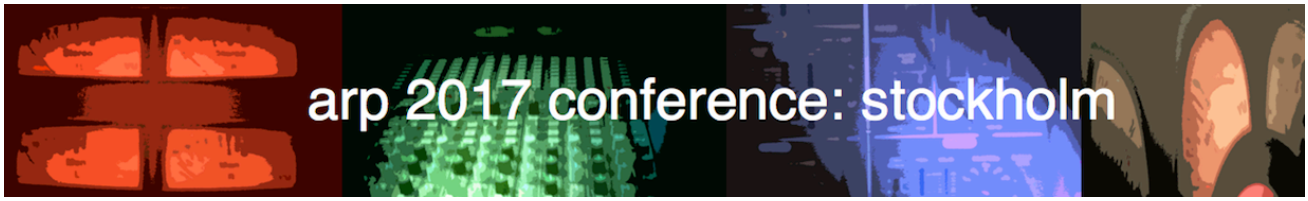

Abstracts: Parallel sessions ARP 2017

The 12th Art of Record Production Conference

Mono: Stereo: Multi

December 1 - 3, 2017

Hosted by the Royal College of Music, Stockholm, Sweden

Abstracts: Parallel sessions ARP 2017

Session 1 A

Christos Moralis: *Bridging the gap between the studio production and the live performance in popular electronic music: The 'Performable Recordings' model*

Abstract: As Nicolas Collins and Julio d' Escrivan Rincón mention (2007), 'It is perhaps a general human habit to view the technological and the organic as opposites. It is certainly the case that the phrase 'live electronic music' strikes many a music fan as oxymoronic'. Since electronic music is all about the consistency in its sonic attributes, performing it live suggests spontaneity, variance, and incongruence between the studio and the live produced musical descriptors. This paper will explain what the 'Performable Recordings' model is and how the gap between the studio production and live performance could be bridged. This production and performance model is based on the research on 'liveness' and on the computer made music expanding the research to include the rhythmic, dynamic, pitch, timbral implications that are characteristic to live performances. Furthermore, this model aims to balance the aesthetics and the consistency of the sonic attributes between the studio production and the live human performance. More specifically, is 'a type of music production that enables the artist to perform live using, in real-time, the same mixing and post production process that applied during its creation'. According to Adam Parkinson (2006), 'Liveness and mediatization can co-occur…Mediatization, may in fact, amplify perceptions of liveness. From this viewpoint, audiences call something 'live'. Since, electronic music is all about the consistency in its own inherent traits and even though is all about the human that steps in and alternates the musical descriptors with his/her live performance, the ability to maintain consistency in the sonic attributes, while preserving also the human emotional expression, can bridge the gap between the studio production and the live human performance.

Emil Kraugerud: *The role of stereo centre placement in constructions of intimacy*

Abstract: Since the normalisation of a "diagonal mix setting" (see Dockwray & Moore 2010), there has been an unwritten rule in production of popular music that lead vocals should be placed in the stereo centre of a mix. There are exceptions to this rule, but in contemporary mainstream pop it has become a standard, along with a tendency to push the vocals as far as possible to the fore of the sound box. This is effective in terms of drawing the listeners' attention to the music, via an increased sense of intimacy with the singer. As part of a PhD project aiming to investigate intimate space in recorded popular music, and the ways in which such spaces contribute to the communication of musical identities, this paper will investigate the background for central placement in the construction of intimacy. In the context of the so-called "loudness war", mainstream pop music is dependent on a sense of immediacy between singer and listener to be able to cut through the "noise filter". Accordingly, the paper will discuss the central placement of lead vocals both as a result of the aesthetic preferences of the producer for constructing a sense of intimacy, and as a practicality for "reaching through" to the listener. This will be based in a combination music analyses and readings of literature addressing various aspects of virtual space (see, for example, Dockwray & Moore 2010; Doyle 2005; Moylan 2015; Zagorski-Thomas 2014).

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Toby Seay: *Towards signifying an engineering ethos through Heavy Metal and Country Music*

Abstract: Much has been written about the production of Metal and Country Music. Since these two genres rarely intersect, one might assume that production methods for each are on different ends of the recording spectrum. While Metal production seeks "definition and intelligibility" (Mynett, 2012), Country music production has been described as "clean and crisp" (Porcello, 2002). A "vital parameter" of Metal is its "sonic weight" or "heaviness" (Mynett 2017). But is this concept of heaviness much different than a Nashville producer's goal of sounding "big as a house" (Buckingham)? While the tools and techniques used by recording engineers in both genres are not unique (Williams 2015), the intended goals may be perceived as quite different. However, might these goals be more universal? This paper explores the notion that the production of Metal and Country Music (and by extension, most recorded popular music) is guided by a common engineering ethos. In doing so, the author will compare written literature, conduct interviews of engineers in both fields, and focus on the use of engineering techniques such as sample supplementation/replacement, distortion, and direct-to-reverberant ratios within a mix. Audio examples will be used to illustrate an engineering ethos through key elements of production.

Session 1 B

Brendan Anthony: *The producer's vision: A study into the multi-faceted cognitive design of the popular music recording aesthetic*

Abstract: Research into popular music record production and its associated creative practice has highlighted that a song's production is often influenced by a multitude of stimuli and these can be musically, sonically and socio-culturally diverse. Technology's influence on musical aesthetics is also at the forefront of scholarly investigations because the democratization of recording technology suggests that the musical spaces producers operate in have changed. Artistic direction however, is still the producer's responsibility and the current landscape for record production is filled with a multitude of creative practice options that shape the recording aesthetic. These can include live or overdubbed performances and electronic programming versus acoustic instrumentation and when combined with technological choices these decisions ultimately frame the creative stages of pre-production, recording, and mixing. So how does the producer ensure a production process that engages appropriate influences, and subsequently manifests a suitable musical result? This paper theorizes that the producer's vision is the constant underpinning of the production rationale and therefore this subsequently designs the recording process and affects musical and sonic aesthetics. It is here that the producer uses multi-modal perception to target genre related outcomes of musicality and the sonic palate, and nurture the capturing of appropriate performances. However the paper argues that this cognitive vision is an individualised trait that is inspired by a 'field of knowledge' from which producers innovate. This paper reports on a qualitative investigation into the producer's vision via a survey of five producers whose experience range from national success in Australia to international acclaim. The paper demonstrates how the data analysis unpacks the discourse surrounding the producer's vision and is supported by research from the fields of creativity, musicology and popular music production.

Phil Harding & Paul Thompson: *Collective Creativity in Commercial Pop Music Production: A Service Model*

Abstract: In his introduction to The Art of Record Production: An Introductory Reader for a New Academic Field (Frith & Zagorski-Thomas, 2012), Simon Frith proposed that producers in pop and dance music genres have a significantly different role to music producers in other music genres such as rock. A prominent difference is that pop music producers are often part of a production team that involves direct collaboration and participation with songwriters, programmers, musicians, artists, management and record company representatives. Pop music songwriting and production teams are therefore more frequently part of a larger creative collective (Hennion, 1990) in creating a musical product. The following paper describes the creative production workflow system at Pete Waterman Ltd. (PWL) Studios during the 1980s and investigates the way in which Phil Harding and Ian Curnow (P&E) worked with manager and entrepreneur, Tom Watkins in the 1990s. Drawing upon a series of interviews and data gathered during an extended ethnographic and auto ethnographic study, this paper presents the pop music 'service' model, which underlines collectivist rather than individualist thinking and illustrates how evaluation is present (and co-current) at the ideation stage in the generation of creative ideas (Sawyer, 2003) at various stages of the commercial pop songwriting and production process.

Tuomas Auvinen: *Differences and Similarities in the Creative Agency of Producers of Pop, Rock and Classical Music*

Abstract: In my presentation, I will explore differences and similarities in the creative agency of the producer in the production process of urban pop music produced in a home studio, rock music produced in a conventional studio facility and classical concert hall music produced in a concert hall setting. Starting from the premise of record production being a collaborative effort, I approach agency as the capacity to make and effect decisions within a structure or even to alter it to some extent, and creativity as contributing to the domain of existing works through exercising aesthetic decision-making. Based on these understandings of agency and creativity, I will examine how different cultures in different production settings and different studios conceived as cultural spaces affect the construction of the producer's agency within creative communities in the production process. Furthermore, I will discuss how differences in understandings of the ontology of the music contribute to the level of creativity, i.e. the contribution to the domain of existing works, that a producer agent can possess. I base my presentation on extensive ethnographic fieldwork of three case studies on production processes, which took place in the course of 2015-2017. The presentation will summarize and discuss some of the central findings of my forthcoming PhD dissertation. This presentation is intended to be in the short presentation format.

Session 1 C

Pete Gofton: *From Shoreditch To Sainsburys; An Ethnography of the Vinyl Music Industry*

Abstract:
Over the past decade or so a growing market has emerged for vinyl records, with specialist record labels and industrial-commercial practices catering for it. I wish to undertake an ethnographic study of this industry, incorporating an examination of the format itself, the record labels that sell it, the marketplace they operate within, and their relationship to the consumers. Through use of physical product, situation within culture, society, and a utilisation of

some of the approaches of ethnography, an interesting paradigm has emerged, rife with contradictions: post urban, yet also grounded in locality and identity. Artisanal and oppositional, yet married to post-digital industry. Borne of the politics of both cultural and physical gentrification, yet an expression of individual politics and identity. By examining the links between the object, its shifting identity in culture, and the increasing corporatisation of that culture, we may come to a greater understanding not only of the music industry, but of the way in which, post digital, culture is increasingly used as an economic engine.

Marco Antonio Juan de Dios Cuartas: *The incursion of stereo in Spanish popular music: the English influence in the definition of a local sound throughout the professional exchanges between Madrid, Barcelona and London.*

Abstract: The figure of the engineer and the musical producer arises in Spain from the 'imitation' of the Anglo-Saxon model. The English professional experience of Alain Milhaud –a French-born producer settled in Madrid who must be considered the first musical producer associated with the rock genre in Spain– with the recording of the song Black is Black in 1964 by the Spanish rock band Los Bravos at the Decca studios in London with the engineer Bill Price as well as other professionals such as the audio engineer Pepe Loeches –who moved in 1969 to London to work at Pye Records studios where he developed his professional activity until 1975–, helped to import into Spain some of the usual working methodologies in English recording studios. Loeches' return to Spain implies, in some way, the importation of some of the Anglo-Saxon working methodologies into the production of our country, exerting an important influence in other professionals and recording studios of Madrid during the decade of the 70s: Kirios, Eurosonic and Musigrama. On the other hand, the recording studios of the major companies were technologically nourished with those devices that had been updated in their studies of origin. To the EMI studio in Barcelona, it came material from Abbey Road, allowing to make stereo recordings with consoles and tape recorders previously used in productions of The Beatles. In spite of this, the introduction of the stereo in Spanish popular music productions does not seem to be delayed as compared to other markets like England or the United States. Audio Engineering magazine, in its issue from March 1961, noted in an article about Hispavox studios in Madrid its experimentation with multiple microphones and the development of the first stereo recording techniques. The incursion of stereo production techniques into Spanish popular music and the influence of the professional exchanges that took place during the 60s and 70s among London, Madrid and Barcelona within an increasingly globalized musical industry, represent the main objective of this research.

Tore Størvold: *Sonic Cartography: Record Production and Geographic Space in Ólafur Arnalds' Island Songs*

Abstract: *Island Songs* (2016) by the Icelandic composer and multi-instrumentalist Ólafur Arnalds, is an audiovisual work spread across platforms: a musical travelogue consisting of recordings, music videos, an interactive website, texts and photos. The creation of *Island Songs* involved Arnalds travelling to seven different locations around Iceland, one per week, where he would compose and record one song at each location. This process was continuously documented on social media, with dedicated #IslandSongs feeds on Twitter, Facebook and Instagram. The production, mediation and reception of *Island Songs* thus explores issues of locality, home and belonging through globalized media technologies. This paper mobilizes the media theory of Jody Berland to shed light on *Island Songs* as a cultural technology of space. Record production is viewed here as a technology involved in the shaping of geographic space: how it becomes inscribed, negotiated and narrated. The paper contextualizes *Island Songs* in contemporary Icelandic society, where the relationship of Iceland to the global has been a central tension following the financial crash of 2008. A distinctly spatial narrative of Iceland as nation state has been observable since its independence, with cultural tropes of distance, remoteness and isolation being key. The paper employs audiovisual analysis in a cultural reading of *Island Songs*, aiming to introduce some theoretical issues regarding record production and geographic space.

Paul Novotny: *Stereo to 5.1–Creating an Immersive fold-out*

Abstract: Look Ahead is a jazz piano and bass, duo recording of performance-music, tracked, mixed and mastered at 24 bit/96khz for stereo and 5.1 playback. Esoteric microphones and pre-amps contributed tonal diversity and contrary to standard practice, the stereo mix was folded-out to 5.1, rather than folded-down to stereo. It was pre-determined that a "sympathetic openness" in the playing and sound was a desirable aesthetic, thus the "performance oriented" physical setup was a blending of the traditional Oscar Peterson and modern Keith Jarrett piano/bass set ups. These choices set forth a coherent foundation toward an intimate, immersive and dynamic performance recording. The stereo sound-field begins at the phantom center position of bass and the 5,1 mix builds outward, maintaining a natural coherence between both versions. The upright bass was recorded with a carefully centered stereo ribbon microphone, a mono hypercardioid condenser and a "DI"— the piano utilized two outside mics (U87's), providing a cohesive center image that is blended into an inside-placed "ultra-wide-stereo" Calrec-Soundfield mic, limited to approximately 90% of pan-width, reserving the outer L/R edges for reflections and reverb. Multiple reverbs were mixed and panned to avoid a dead-spot between the R-RS and the L-LS. Since there are no drums this "chamber" became a featured

participant of the ensemble, providing unexpected and contrasting responses to percussive attacks.
The conclusion asserts that a stereo sound stage built on traditional performance and recording values provide a connecting foundational coherence when folding-out. A stereo to 5.1 fold-out, rather than a "5.1 fold-down", offers additional immersive enhancement—specific to 5.1—resulting in diverse custom masters that share strong foundational innate commonality.

Jo Lord: *3D Audio for Music*

Abstract: The research project investigates and explores the development, practical application and aesthetic suitability of 3D mix technique for record production, the current developments and changes in consumer listening behaviour and the demand for an aesthetic, affordable and convenient 3D audio reproduction. The practical element focuses on re-composing stereo pieces for 3D over headphone consumption using perceptually-motivated production and an Auro 13.1 speaker array. The study's first objective analyses the translation differences between the 13.1 speaker reproduction and the binaurally encoded 3D versions, negotiating the practical and aesthetic adaptations required for mixing 3D for headphones using a multichannel speaker array and binaural encoding. An important and fundamental objective posing questions such as; 'How should we mix 3D music for current user listening trends?' "How will variation of encoder, headphone and listener affect the perceived musicality and 3D translation?" Research as practice takes an ecological focus in the development of 3D production technique. The study's second objective works alongside the first, investigating auditory perceptual phenomena, peripheral and kinetic staging, timbre, conceptual blending and sonic cartoons. Drawing upon questions such as; 'How could we utilise 3D audio to benefit composition and music production?' 'How could we utilise our understanding of human perception to better 3D music production?' and 'How could we arrange a sound stage for 3D music?' The second objective's listening tests analyse the importance and effectiveness of the 3D aesthetic against original stereo mixes, examining localisation, recomposition, musical application and creative effect. The translation of array to headphones and the creative 3D aesthetic are subjectively assessed in both 13.1 and 3D binaural playback during a series of randomised listening tests using a consistent sample of expert and non-expert consumer volunteers. The AV presentation playfully examples interesting 13.1 audio playback demonstrating 3D production, 3D sound staging and sonic cartoons developed in research.

Session 2B

Elizabeth Varnado: *Sonic Totems: The sampling aesthetic of Bon Iver's "33 God"*

Abstract: In September 2016, Bon Iver released their third full-length album, 22 A Million. Full of digital samples and gritty, manipulated textures, the album is brazen and bold if compared to Bon Iver past. Known for sweeping emotionality and Justin Vernon's melancholic, free-association lyrics, Bon Iver took a four year hiatus after releasing Bon Iver, Bon Iver in 2011. In that time frame, Justin Vernon worked with Kanye West, hip-hop's self-proclaimed god, and released a few tracks with moody electronic artist, James Blake. With only these few and far-between performances as clues, rumours flew about whatever Vernon was sweating through to release next. In this paper, I will explore the various types of sampling used within "33 God," the fourth track on 22, A Million. I will discuss how Justin Vernon's use of sampling aligns with the tradition of hip-hop, specifically in his prioritization of timbral authenticity, and his tendency toward signifying, as described in the studies of hip-hop by Joseph Schloss (2004) and Mark Katz (2004), extended from theories by Henry Louis Gates, Jr. (1988). I will explore how Justin Vernon weaves digital samples (using an OP-1 Synthesizer and a device especially built for this project) into his own vocal presence on the track to create an audio-autobiography, where Vernon's perspective, assumed authentic because of his singer-songwriter reputation and delivery, is combined with the perspective and vocal delivery of those he samples: Jim Ed Brown, Paolo Nutini, and Lonnie Holley. I will investigate Vernon's use of these samples as "sonic totems" and symbols of "otherness"—other times, other places, other emotions—which are layered and collaged in order to convey his own memories and mental states, through the voice and timbre of others. I would like to present this paper as a long-form presentation of completed research. I would require AV equipment with laptop hook up to present diagrams, charts, and to play musical selections.

Jose Manuel Cubides-Gutierrez: *The Portable Studio: The City as a Recording Studio*

Abstract: The way we 'consume' music has changed over the last decades due to the development of new and more affordable technology. The producer and engineer have become consumers creating a whole new marketing target for audio technology developers. Additionally, the final recording is listened to on inexpensive equipment such as low-cost earphones and laptop speakers despite the expensive and delicate process the music has gone through. Also, the fact that nowadays everybody can record and distribute music easily from the comfort of their own homes has blurred the lines between professional and amateur music producers generating an oversaturated market of audio equipment affordable for a wide range of the population. Given that this argument has been examined a lot from the democratisation perspective, my doctoral research has been exploring the creative possibilities of the utilisation of inexpensive audio equipment and the ground in between raw found sound and highly processed samples where all their original character is removed and they sound indistinguishable from the instrument they are emulating. For instance: making percussive, harmonic and melodic sounds out of car doors, train announcements, and healthcare equipment sounds amongst others.

The aim is to demonstrate the range of creative possibilities for music composers and producers using only a portable recorder and a DAW for post-production. This includes experiments such as creating binaural recordings using in-ear microphones and mixing them into multitrack productions. The research has been based on ideas by Paul Théberge (1997), Brøvig-Hanssen and Danielsen (2016), Bull (2000), Miller (2008), Gandy (2014), Baker (2012) O`Rourke (2013), and Zagorski-Thomas (2017) amongst others. Finally, this presentation will finish with a brief reflection and analytical comparison between different methodologies employed for making popular music recordings out of inexpensive audio equipment.

Session 2C

Kirsten Hermes: *Enhancing creativity through research: developing a novel spectral clarity measurement tool for use the mix process*

Abstract: Mixing music is a complicated process and hence, automatic mixing or metering tools are beneficial. In a prior research study (Hermes et al., 2017), the spectral clarity of sounds — one particularly important parameter of music mixes — was investigated. Two predictors of spectral clarity are the harmonic centroid (a weighted centre mass of energy of a sound spectrum, Hermes et al., 2016) and spectral inconsistencies related to sharp peaks roughly in the middle of the frequency spectrum (Hermes et al., 2017). Naturally-occurring sounds can become more clear when low-Q equalisation is applied to boost the less-audible higher frequency regions (raising the harmonic centroid). However, if equalisation exaggerates or introduces timbrally unpleasant spectral inconsistencies, then these can mask or distract from other sonic components and lead to a clarity reduction. In order to work towards the development of automatic mix quality measurement tools, two simple computational tools were devised to detect changes in these parameters (Hermes et al., 2017). In the current study, the impact of these tools on the creative process is tested and starting points for further research are established. As an electronic artist, the author has been writing, producing, performing, mixing and mastering original songs for approximately ten years. Since the entire creative process is undertaken by just one person, external, objective feedback on the mix process can be useful. Therefore, the clarity metric is used as guidance for a vocal mix in a house music production. Feedback is also gathered from a group of additional audio professionals. It is established that the tools can be beneficial not only for automatic mixing; but also in the manual mix process. Improvements of the clarity model are discussed.

Xuefeng Zhou, Qinhai Li & Xian Cai: *Timbre Perception in Affordances and Aesthetics*

Abstract: This paper addresses timbre perception in three issues as the following: (1)Timbre perception is possible to musicians. According to Vuust et al. (2012), the characteristics of the style of music played by musicians influence their perceptual skills and the brain processing of sound features embedded in music. And results from Garner et al. (2015) showed that training benefits are dissociable for the brain events that reflect distinct sensorimotor processing stages. Beside perceptual skills and training benefits, selective attention to a specific object in auditory memory does benefit human performance not by simply reducing memory load, but by actively engaging complementary neural resources to sharpen the precision of the task-relevant object in memory (Lim et al. 2015). These results deduce a possibility of timbre perception although experimental materials of the second and third research are not ecological music. (2) Using a sentence of an ecological music, this study employed the Audacity and five pianists' samples recorded near the performer and in auditorium. Single sounds, a global state and timbre contour of ten samples were evaluated. (3) Then the standards of timbre were discussed according to views of different cultures, e.g. the west and east. Further study of perception experiments need to be carried out. We hope to interpret how are these sociocultural and technological changes related to the sounds of recorded music.

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Session 3 A

Brecht De Man, Kirk McNally & Joshua Reiss: *Behind the Mix: Exploring the influence of a music producer's background upon their creative practice*

Abstract: This paper looks at the question of how a music producer's background and local music culture affects the aesthetic and technical decisions made when realizing a music mix. Given the same multitrack recording, two engineers can deliver wildly different products, or indeed, very similar ones. Using a dataset of mixes created by engineers from significantly different geographical locations we investigate where approaches are shared and where they differ. This question has been dealt with on the macro scale by Zagorski-Thomas, where he questions whether UK vs USA rock music of the 70's has a discernible sonic signature. Zooming in, the same question has been posed by Cummings, Horning and Seay, who examine the local culture of a city and a studio(s), respectively, in order to gauge the effect upon the musical output. In each of these cases the entire creative process is encapsulated in the analysis of the end musical work, from recording to mix, to release. This work has simulta-

neously identified the intriguing nature of the question, but also the difficulty in answering it. The study here limits the music production process to mixing. A shared set of pre-recorded multitrack recordings were mixed by a number of engineers with different backgrounds and from different countries. Analysis of both the final musical output and individual mix elements (stems) allows for further insight into how this common material is approached by these different music producers. Statistical analysis determines the extent to which differences in approach are likely to be influenced by the mixer's background. The work extends previous work in this area to include objective comparison of audio features and processing parameters between mixes of similar songs, including loudness balance and reverberant ratio. Furthermore, mix evaluation by listeners from the same groups of expert's reveals to what extent preferences, focus, and perception differs as a function of personal background.

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Andrew Bourbon & Michail Exarchos: *From Southern (T)Rap to Club Atmos: A Live Performance of Samples, Beats and Modular Synthesis Exploring the Inter-stylistic Evolution of 'Synth-Hop' in Surround*

Abstract: Although Hip-Hop is primarily considered a sample-based musical form, its historical journey has been frequently 'contaminated' by the use of synthesisers. From the appearance of analogue mono-synths in early Electro and G-funk, to the use of synthesised drum sounds (Roland TR-808) in Southern Bass music and Boom Bap, a plethora of rap subgenres have challenged their primary dependance on sampling in order to navigate the legal landscape and signify geographical or stylistic divergence. Contemporary Hip-Hop has expressed a new-found synthetic obsession as a result of these forces, continuing a process of stylistic morphing that began with synth-heavy Southern (US) subgenres such as Crunk and Trap. But under the apparent sampling and synthesis binaries lies a larger inter-stylistic mechanism, mirroring the interaction between Hip-Hop and other musical genres. On the one hand, Hip-Hop's sampling philosophy is expressed in its inclusive modus operandi looking outside of itself—Funk, Rock, P-funk, Disco, Pop and Electronica—to redefine its instrumental bed. On the other hand, fewer are the cases when Hip-Hop has had the opposite effect on Electronic Dance Music (EDM). Yet with the subgenre of Trap, the common synthetic denominator between it and Electronica has energised a reciprocal and international dynamic, with Trap gradually morphing to instrumental electronic music, reaching European dancefloors, and crossing over from EDM's underground back to the rap mainstream. At the same time, European dancefloors have been experimenting with multi-channel speaker formats (Ministry of Sound), while sampling drum machines, such as—Hip-Hop's primary tool—the Akai MPC, have evolved to represent workflows favoured by both rap producers and EDM DJs combining live performance capabilities with sampling-synthesis integration (MPC X). The Live Performance leverages these new technologies in order to express the inter-stylistic opportunities afforded by the historic evolution of rap and electronic subgenres, their convergence, and the aesthetic implications of technological affordances identified in the creative tools deployed and dissemination formats explored.

Michail Exarchos: *Mono Samples | Stereo 'Joints': Exposing Hip-Hop's Modus Operandi in Surround*

Abstract: Sample-based Hip-Hop production recontextualises the sonic past, juxtaposes multiple sonic 'pasts' with the present, and proposes a multi-dimensional phonographic construct as a result. While the harmonic and rhythmic qualities of the rap construct attempt to 'glue' its inherent multi-dimensionality and exponential juxtaposition, the sonic staging of contemporary Hip-Hop often exposes and exaggerates the effect. The phenomenon is the result of a complex web of contributing factors, ranging from developing aesthetic values, to the effect of sample legislation, to pragmatics borne out of technological necessity. Rap's aesthetic and pragmatic mix preoccupation with the centrality of the beat, bass and voice—combined with the pursuit of optimum loudness via middle-and-side mastering techniques—position the sampled past in literal and metaphorical distance, exaggerating the illusion of 'depth', and directing the listener to the immediacy of the present. As contemporary music production moves from a post-modern duality to a meta-modern multidimensionality, does Hip-Hop exemplify this notion in its simultaneous collapse and celebration of temporal and spatial distances? How can these stereo production traits—audible in the work of contemporary rap producers such as Kanye West—be further explored in multi-channel formats? In the author's own professional output, samples of Greek folk legends and reggae orchestras have been juxtaposed with electronics, beats and rap, leading to the first 5.1 rap mixes commissioned in the Greek market (and the first MTV Best Greek Act award in 2008). As part of a larger research project exploring the effect of vintage production techniques on contemporary Hip-Hop, the investigation deploys a reverse-engineering methodology, (re)constructing mono samples referential to past eras and positioning them in the hip-hop mix. Using (auto)ethnography and reflexivity, the applied exploration expands the staging effect from stereo to surround, examining the implications of sonic signatures derived from traditional formats (tape, vinyl) on the stylisation of a

genre, and navigating future opportunities for innovative staging within a multi-channel context.

Session 3 B

Ragnhild Brøvig-Hanssen: *Dynamic Range Compression's Influence on Perceived Timing*

Abstract: To what extent does the signal processing operation Dynamic Range Compression (DRC) influence our auditory perception of temporal placement at the micro level in music? Compression is used on most popular music recordings and its function is usually explained as narrowing or compressing an audio signal's dynamic range, often with the purpose of making the music sound louder, or making sonic features within the music more consistent in dynamic range. In EDM music, compression is also often used to reduce the amplitude of one sound source at the moment when another sound source reaches the threshold–an effect usually referred to as side-chaining. While compression is usually described in terms of dynamics, this paper examines the extent to which compression (master compression, individual compression and side-chaining) also influences our perception of the compressed signals' temporal placements. This examination relies on Danielsen's hypothesis that perceived temporal location of a sound is affected by the sound's sonic features, including temporal envelope (Danielsen 2015). A compressor is a complex amplitude modifier that influences the compressed sound signal's envelope. As such, it is hypothesized that the use of compression manipulates temporal relationships at a micro level. This hypothesis will be tested through the use of two methodological approaches and draw on recent studies on the relation between sound and timing (Danielsen 2006, 2010, 2012, 2015; Goebl and Parncutt 2002; Hartmann 1995; Hove et al 2007; Lakatos 2000; Tekmann 2002; and Wright 2008). The first approach is interpretive musical analyses of selected EDM music, in which I will use a combination of auditory and graphical analyses, supported by calculations of relevant physical measurements using the MIR Toolbox for MATLAB. The second approach is qualitative semi-structured interviews with EDM producers and engineers, in which they reflect upon the compressor's influence on timing at the micro level.

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Hans T. Zeiner-Henriksen: *Sidechain compression and pulse perception in music production*

Abstract: The use of DAWs in music production has during the last decade(s) given the musicians/producers an incredible control over the many parameters of sound. Various plug-in effects and synthesizer parameters can be programmed to make detailed modulations that enrich the production. Based on theories within embodied cognition and my earlier work on bass drum sounds with descending pitch movements on the downbeat (Zeiner-Henriksen 2010) I now turn to off-beat sounds that in a similar manner may establish reference points (or movement affordances) that are vital for how we may perceive the pulse. Among others, Troye Sivan's track «Fools» from 2015 will be used to exemplify the phenomenon.

Anne Danielsen: *The perception, aesthetics and cultural values of 'glitched' grooves*

Abstract: Rhythmic feels produced by inserting glitches into a played groove post production or warping samples in different ways are now widespread in a wide range of popular music styles, from mainstream pop to experimental hip-hop. In this paper, I present an analysis of the song '1000 Deaths' from the album Black Messiah (2014) by D'Angelo. I will, first, map the micro-rhythmic relationship of the groove, and, secondly, relate its micro-rhythmic design to examples of similar past and present practices. The aim is to explore the wide array of aesthetic and cultural meanings that these production practices have taken on, bridging the gap between technical descriptions of sound/sound production and interpretations of its cultural and contextual meanings.

Session 3 C

Joe Bennett: *"How someone controlled you": The Digital Audio Workstation and the Internet as influences upon songwriting creativity*

Abstract: This paper investigates the interrelationship between studio-based songwriting processes and artistic product, focusing on two digital tools that became available to songwriters towards the end of the 20th century: the Digital Audio Workstation (DAW), and broadband Internet connectivity. Building on recent research into computer-enabled music creativity (Marrington, 2011, 2017; Mooney, 2010), the paper asks whether DAW interfaces, combined with various online tools, has provided 'cognitive extensions' (Magnusson, 2009) for songwriters. If these digital tools have had a material influence on songwriters' creative activities and workflows, how might this be evidenced in the musical characteristics of contemporary popular songs? Groups of successful hits are compared between the analogue and digital eras, with the aim of identifying a correlation between musical characteristics (chord loops, phrase lengths etc) and creative processes and workflows. Several professional songwriter case studies are provided, including a 'digital immigrant' (Prensky 2001) who began to write songs before digital tools were available, and a 'digital native' (ibid) has always used DAWs and an Internet connection in his songwriting. The participants were asked to describe their creative processes in detail, and to reflect on how these tools may have influenced their decision-making and artistic direction. From these and from previous studies, the author attempts to identify behaviours and affordances engendered by digitally-enabled songwriters, and to make inferences regarding these tools' influences on song characteristics.

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Daniel Pratt, Shane Hoose & Wellington Gordon: *Transnational Group Flow: Writing and Recording Music in Three Different Locations*

Abstract: Writing and recording music in multiple geographical locations with a decentralised group structure presents a series of challenges. These include technical integration, creative flow, organisational cohesion that allows for the unexpected, and maintaining a unity of musical vision. This paper frames the difficulties of creative collaboration across geographical distance as organisational challenges to be overcome. Using the group flow theoretical models of Sawyer, and the improvisational sensemaking focus of Karl Weick's work, we investigated the creative challenges of distance and audio recording. Working with three music production academics in songwriting and recording sessions, we used Dropbox and Reaper as open platforms for an exchange of ideas. Each practitioner brought their own tacit knowledge to the project. The expanded use of recording spaces in three different geographical communities of practice presented opportunities for musical experimentation and organisational interpretation. These creative challenges do not exist in the traditional single studio environment, and as such we investigated whether the challenges of distance and creative flow need reframing as creative organisational opportunities. We implemented and evaluated organisational theory designed to address the challenges inherent in this recording set up.

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David Myhr: *What goes on in my mind? Observing melodies in the making*

Abstract: This paper posits a set of epistemological methods to enable researchers to investigate melody-writing in solo songwriters. Using ethnographic and autoethnographic methods combined with annotated video, I provide examples, from my ongoing research project, of real-time songwriting activities and address the opportunities and challenges of introspection as an investigative method. Sloboda (1985) proposed four possible methods of inquiry by which researchers might investigate composers' creative processes, one of which is "live" observation of composers at work. Collins (2007) uses a verbal protocol methodology that requires the composer to narrate the evolving composition in real time, which not only interrupts the creative process itself, but risks falling victim to the observation effect. Bennett (2014) suggests that observing co-writing processes has an immanent advantage over solo writing through the fact that the necessity to communicate ideas makes it an evidence-generating activity. The methods proposed combine digital video documentation, immediate post-hoc introspection and qualitative data analysis. The songwriting session is recorded in full, followed by immediate post-session review and captioning of identified 'key moments'. This enables the composer to reflect immediately upon the session, adding extra insight such as explaining

moments of silence/reflection that would be otherwise lost in the observation.

Session 4 A

Alex Case: *Oops, Do It Again - Gated Reverb From the 80s to Today*

Abstract: Among the more absurd sonic concoctions to come out of the recording studio, gated reverb offers a unique aesthetic possible only through loudspeaker-mediated sound. Born in the 80s, it relied upon creative, even counterintuitive application of some of the newest signal processing technologies of the time. The genesis of gated reverb was part discovery, and part invention. Its further development was motivated by rebellion, and confusion. Peter Gabriel did it first, with "Intruder" (1980). Phil Collins made it famous, with "In the Air Tonight" (1980). But David Bowie likely inspired it all with tracks like "Sound and Vision" (1977). This paper tours the development of gated reverb, with audio illustrations showing when, how, and why. What began as a radical reshaping of timbre has evolved into a more subtle form. Gated reverb remains relevant in contemporary music production, not just for 80s pastiche, but as a tool for overcoming masking through the strategic leveraging of its unique psychoacoustic properties.

Tor Halmrast: *SAM PHILLIPS´ SLAP BACK ECHO; LUCKILY IN MONO*

Abstract: "Slap back echo" was created by Sam Phillips for Elvis Presley´s early Memphis recordings. Using cepstrum and autocorrelation, we find that the tape delay used in Sun Studios was 134-137 ms, which is so long that the echo is perceived as a single, distinct echo in the time domain, and not the comb filter coloration of timbre in the frequency domain defined as Box-Klangfarbe. Such coloration would be perceived if a distinct, separate, reflection gave a comb filter with a distance between the teeth (CBTB: Comb-Between-Teeth-Bandwidth) comparable to the critical bandwidth along the basilar membrane in the cochlea. When Elvis changed to RCA Victor´s studio in Nashville, "RCA was anxious to recreate the "slapback" echo…To add them to Elvis' vocals Chet [Atkins] and engineer Bob Farris created a pseudo "echo chamber" by setting up a speaker at one end of a long hallway and a microphone at the other end and recording the echo live". Analysis of these recordings gives that the echo is somewhat shorter (114 ms and 82 ms), and much more diffuse, so "slap echo" was not actually recreated. The main findings is that even though the delay time of the Sun Studio "slap tape echo" is long, the echo is still perceived as rather "close", because the echo is in mono. Panned in stereo, the feeling of being inside a small room would disappear. In addition, we analysed also a shorter delay, as for a possible reflection from the floor of the studio back to the singer´s microphone. These results are more unclear, but we found that such shorter delay would have given Box-Klangfarbe, but if this actually was a floor reflection, the measured deviation of the delay time must mean that the singer moved his head during the recordings (a highly reasonable assumption for Elvis!)

Kai Arne Hansen: *Interpreting Sound Recordings in a Time of Media Convergence: Aesthetics, Technologies, and the Migratory Behavior of Audiences*

Abstract: While recent technological developments have led to a range of new possibilities for the recording, production, and distribution of sound recordings, equally significant changes have ensued with regard to audiences' usages and experiences of music. These changes concern not only how we access and listen to sound recordings, but also how we make sense of them. In light of what Henry Jenkins (2006) has described as the migratory behavior of media audiences, this paper considers the multi-modality of our present-day music experiences. By attending to the primacy of the artist persona in a contemporary pop music context, I call attention to how sound recordings are interpreted vis-á-vis other pop commodities and discourses surrounding the artist. I suggest that, as the representational strategies that promote and aestheticize the artist persona across multiple platforms become increasingly pervasive and sophisticated, listeners become accustomed to enriching their musical experiences by seeking out additional content and information through various media. By merging recent theories of intermediality and transmediality with a critical musicological approach to interpretation, I attempt to demonstrate how symbols and signs dispersed across multiple media platforms are aggregated in the experiences of listeners and fans. To this end, I focus on the recent output of one commercial pop artist to take up how recorded sound operates alongside other media content to imbue our musical experiences with various meanings.

Session 4 B

Steven Gamble: *From recorded sound to musical soundworld in popular music listening*

Abstract: Recorded popular music affords virtual, spatial, narrative environments for its listeners. Much scholarly inquiry has focused upon either technological decision-making in music production or the creation of meaning in music perception. These studies give much insight into technology and expression on one hand, and aesthetics and interpretation on the other. These dichotomies are at times necessary, but may conceal as much as they reveal. At what point does 'hard right' on a pan pot become 'creeping up on my right' in a listener's headphones? An emerging body of work instead draws upon an ecological approach to perception and embodied cognition in order to directly investigate the relationship between the two. Perhaps the best known example is Moore's (2001) soundbox: what leaves recordists' hands as the mix/master becomes the soundbox in the listener's imagination, and from there we can begin to investigate the

meaning any given track affords for that listener. Another useful concept is Zagorski-Thomas's (2010) development of staging in recorded music. Without rigorous empirical evidence, however, a great deal of care must be taken in claims about listener perception. Using a theory of affordance, I discuss the kind of cautious claims we can make about the potential for meaning to arise in the listening process, referring to a single progressive metal track, Karnivool's (2009) 'Goliath'. This theory of affordance, based in Gibson's (1977) ecological theory and substantiated by Lakoff and Johnson's (1980) experientialism, may be a helpful way to investigate the emergence of meaning between sonic data and listener experience. To do so, it is important to clarify this position from its present use in musicological work: it does not merely mediate between the objective and subjective, but fundamentally questions this distinction to begin with.

Eirik Askeroi: *Sonic Markers in Popular Music*

Abstract: Throughout recording history, the use of different technologies and instruments has left lasting impressions on recordings, suggesting an almost intrinsic relationship between sound and period. With an increasing momentum from the early 2000s and onwards, producers, engineers and mixers, especially within the realm of popular music, have taken compositional advantage of this relationship, constructing what I label sonic markers: Musical codes that have been historically grounded through a specific context, and that, through their appropriation, serve a range of narrative purposes in recorded music. In the proposed paper I will explore this concept as a careful navigation between the two following positions: 1. Sonic markers as narrative strategies—how sonic markers can be used as a means of constructing musical identities in pop production. 2. Sonic markers as constructions—how sonic markers themselves are constructed through different narrative strategies. Presented against a backdrop of various musical examples, I will argue that sonic markers constitutes an inroad for interpreting the expressive dimensions of musical sound in recorded music for practitioners as well as academics. Exploring the potential effects of musical codes in recorded music requires close readings of musical texts against a contextual backdrop of journalistic and scholarly writings (articles, interviews, blogs, books), biographies, documentaries, semi-biographical movies (biopics), music videos and social media. The overall aim of this paper, then, is to demonstrate how sonic markers operate within different discursive formations and supply "sonic evidence" for identity formations in popular music.

Toivo Burlin: *The making of virtual space in the King Crimson Box sets Larks tongues in as-pic: Complete recordings, Starless, Road to Red, On [and off) the Road and Thrak Box: Live and Studio Recordings 1994–1997*

Abstract: When the founding fathers of progressive rock, British (-American) group King Crimson, produced their groundbreaking LP In the Court of the Crimson king in 1969, they established an eclectic yet recognizable style, with a strong musical and production virtuosity. From 2010 and onwards all of King Crimson's back catalogue was systematically re-released, some of their albums was also re-packaged in deluxe box sets: In the court of the crimson king, Larks tongues in aspic: Complete recordings, Starless, The Road to Red, On (and off) the Road and Thrak Box: Live and Studio Recordings 1994–1997. They all covering both studio recordings and live recordings that was produced in and around the period of the original recording sessions, in a various set of mixes, alternate takes and sound codec's. In this presentation the focus is on sketching out an analysis of the mixing strategies on the surround mixes in DTS-HD Master Audio and LPCM 5.1 Surround of the studio recordings and live recordings, as it can be heard, using models for analysis of recordings, the Representation Model and the Room Model.

Paul Theberge: ReCon: Recording Consoles, Reconsidered

Abstract: In the rock press and in recent films and television programs, a number of accounts of audio production have marked the recording console as an object of popular mythology, establishing a nostalgic constellation of associations between analog mixing consoles, recording studios, artists, hit records and, more generally, the history and aesthetics of popular music. Ironically, this fetishizing of analog recording consoles follows a lengthy period in which digital consoles have increasingly gained market share over their analog counterparts. The recording console is a technology whose primary function is to simultaneously enable and reduce multiplicity: it combines, modifies and shapes multiple inputs and configures them for a small number of discrete outputs (and consumer formats): mono, stereo and multi. The ways in which consoles have been designed to accomplish these tasks, however, is variable. This paper will survey a select number of historical shifts in console design in order to understand the specific technical affordances offered by them and their aesthetic significance. Of initial interest are the changes in console design that coincide with the historical development of multitrack recording practices. The console was, arguably, a singular device within the multitrack studio – a device whose affordances enabled multitracking as a technical process, mediated communications between musicians and producers, and supported the sound engineer's claim to artistry. With the increasing complexity of contemporary studio recording, live touring, and cinema post-production practices, however, analog consoles have given way to multilayered digital control surfaces, where only a fraction of the mixing and processing functions are available to the sound mixer at any given time, resulting in new levels of abstraction and the affordances of full automation, digital storage and instant recall. These changes in design require a re-evaluation of the console: as a form of remediated technology, a set of shifting aesthetic practices, a network of

human/ non-human interactions, and as emblematic of cultural values in a digital age.

Session 4 C

Kirk McNally, Toby Seay & Paul Thompson: *Another Take: Teaching Music Production Using Multitrack Recordings*

Abstract: Historically, the apprenticeship model of training in the recording studio allowed student engineers to learn from the masters of their craft. However, recent studies have shown that the recording studio sector has suffered a significant decline within the broader musical economies (Leyshon, 2009), which has resulted in the fragmentation of the knowledge capitol that was traditionally found in larger recording facilities. University music production programmes have assumed the role of instruction, changing the nature of knowledge transfer from entirely informal and in-situ, to more formal experiential and theoretical (Thompson & McIntyre, 2013). Educational institutions offering music production programmes are therefore challenged to provide appropriate resources to support learning that would have otherwise been learnt on-the-job. However, currently available literature and AV resources often overly focus on technical knowhow and typically fail to connect technical decisions to the potential aesthetic consequences upon the musical output (Askerøi, Viervoll, 2016). In other words, there is a "virtual absence of pedagogical resources" (Zagorski-Thomas, 2016) that help to explore and connect technical, aesthetic and musical relationships. This paper explores the ways in which three institutions, Drexel University in Philadelphia, USA the University of Victoria in British Columbia, Canada and Leeds Beckett University in Leeds, UK are working to address some of these questions. We argue that multitrack materials afford a rich historical, practical and aesthetic resource for use in music production programs that help to connect technical decisions to aesthetic consequences within a musical context. Importantly, we illustrate the ways in which music production education can tap into the well of historical knowledge by using multitrack materials and, how moving the master into the classroom, can provide a greater level of access to their knowledge and ways of working.

Sören Johansson & Nyssim Lefford: *The student's view of the producer's role: Analytical methods, interpreting content and practical project management*

Abstract: In the sound and music production Bachelors program at Dalarna University, we have conducted a case study to assess how students understand the producer's multifaceted role (following on, for example, Burgess, 2013) and if and how they utilise analytical methods in their producing practice. Our curriculum emphasizes critical thinking, preparation for working life, and communication and collaboration. These aims are especially apparent in the producing coursework— because, practically speaking, producing involves analyzing what is heard and communicating about interpretations. Regardless, students are reluctant to embrace analysis as a practical tool. To address this, we offer a (pop) vocal production workshop that integrates scientific research, theoretical musicology and practical concepts. It delivers techniques for production analysis and a framework for connecting vocal affect to the vocal persona revealed as the lyrics are performed. Perception research provides concepts about affect. Other techniques are drawn from production and musicological literature, from practitioners and theorists both. (Wadhams, 2001; Cone, 1974; Tagg, 2013; Hennion, 1983) We investigated if students use these ideas in later work to plan, produce or communicate with session participants. Three students participated while working on their senior-year production projects. We started with semi-structured interviews to ascertain how they understood the producer's responsibilities and their knowledge of production techniques. Later, they responded to a questionnaire about their specific projects. Results show they understood the producer's multifaceted role and the need for some analysis of the material, in preparation and production. They struggled with concrete examples of methods. They unanimously expressed hesitance to discuss lyric interpretation or interfere with vocal performances, while simultaneously acknowledging the importance of lyrics in pop production. They demonstrated management skills, but their most analytical reflecting pertained to release formats and distribution channels. This study has raised new questions about what the curriculum could or should address.

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Daniel Pratt, Brecht De Man & Joshua D. Reiss: *Developing mix evaluation skills in higher education: A technology-aided approach to self-directed learning*

Abstract: Mixing a multitrack recording is a complex and critical task involving many creative decisions, where any two engineers can produce wildly different results from the same source material. To understand more about these phenomena, De Man developed an online tool for evaluating multiple mixes of the same song. This tool has been used to better understand different mix approaches taken by sound engineers from a range of geographical locations and education levels, and mix evaluation has become a useful pedagogical tool for educators interested in technology-aided course design. Students respond to the comparative nature of the mix evaluation tool and understand their mixing practice on a deeper level be-

cause of this comparative analysis. Our thesis is that the evaluation tool acts as a passive learning device to develop students critical listening and mixing skills. A group of third year students from QUT in Australia participated in a series of mixing workshops using the mix evaluation tool as a pedagogical device. We educated the students in critical listening and mixing techniques and challenged them to produce a mix in one week using a restricted set of tools. During the mix sessions, staff observed the students' engagement with the evaluation tool as a method of developing their mixing practice. The students were then given the option to revise their mix before submitting it for summative assessment. We observed whether students are passively motivated to improve their mixes after participating in the evaluation. Finally, we interviewed a selection of students to better evaluate their impressions of the mix evaluation tool. Through a triangulation of observation, data collection from the evaluation tool, and interviews with staff and students we investigate the mix evaluation tool as learning device beyond its primary function as a data collection device.

Session 5 A

Magda Mayas: *Piano mapping/ Memory piece: a work for amplified piano and multi channel playback*

Abstract: I am doing research as a PhD student at the University of Gothenburg and I am proposing a performance presentation in a multi-speaker set up. I am exploring and experimenting with a grand piano, objects, microphones, speakers and space in the realm of improvised music. The relation between these elements and their relation to me is constantly shifting, and with it my defined role as a performer or listener becomes blurry. Finding a more engaged relationship with space, sound and the listener and transmitting my listening experience to others is the main concern of my research practice. I amplify the piano in a surround speaker set up with the piano in the middle of the space and the audience around it. Through spatial mapping I am expanding the piano to the size of the entire room, creating an immersive feeling for the audience of being inside the piano. I am controlling the routing and distribution of the microphones through the speakers through a simple max patch, changing between different presets during the performance, emulating the piano's geography in the space and constantly shifting it. "Memory piece" is a documentation and recording of processes of change while playing inside this "piano map" of a surround set up. Segments of these recordings are created into a separate piece, which serves as a sparse installation element in a new surround set up that I improvise with in a live performance. Overlapping multiple realities of environments and piano maps, I am creating a space within a space and in doing so, turning space into an instrument as well, adding manifold sonic and psychological layers. I encourage the audience into different perceptual modes by mediating their listening to the blurring of different spaces and to the disembodied sounds.

Aaron Liu-Rosenbaum: *Immersion, Wanderlust and the Ambient Experience: A Narrated Multi-Channel Soundscape Performance*

Abstract: As sound technologies proliferate and metamorphose, the "art of record production" is recast into interesting new forms with new aesthetic possibilities. One such form is soundscape composition, whose goals can range from sonically preserving real places, to creating artificial ones. The success of a soundscape composition depends, in part, on its ability to transport the listener to a new soundworld, and multi-channel audio recording and diffusion play a key role, as they offer a means of auditory immersion and control heretofore unavailable. This quest for immersion also transforms the spaces where music is consumed, such as in the Philips Pavilion at Expo '58 in Brussels, whose hyperbolic architecture served to emphasize the spatial effects of the multi-channel music heard through its several hundred integrated speakers—or more recently, the multi-channel speaker array installations making their way into concert halls, cinemas, and even university research centres. For this presentation, I will briefly discuss some technical and aesthetic considerations in the production of immersive, multi-channel soundscapes, and will follow it with a performance of one of my soundscape compositions. The piece will be composed to exploit the sound system in the venue.

Session 5 B

Larry Whelan: *The Roland TB-303 and timbre: Klangfarbenmelodie for the rave generation*

Abstract: The Roland TB-303 Bass Line synthesizer is one of the most important devices in the history of electronic music and it's widely acknowledged as an example of technology that's significantly influenced the development of musical genres in which it was used. Most accounts of the TB-303 to date have tended to focus on its technology and history, from its initial release by Roland intended as an accompaniment device through to its adoption, creative repurposing and widespread use by electronic music producers from the mid-1980s onwards. The purpose of this paper is to focus on the musical qualities of the TR-303 and it will be shown that its importance stemmed from offering possibilities of timbral manipulation in a field where timbre was becoming predominant over pitch. I will examine the TB-303 in relation to Arnold Schoenberg's concept of Klangfarbenmelodie, who envisaged: "if it is possible to create patterns out of tone colours that are differentiated according to pitch, patterns we call 'melodies' … then it must also be possible to make such progressions … out of that which we call simply 'tone colour', progressions whose relations with one another work with a kind of logic entirely equivalent to that logic which satisfies us in the melody

of pitches."[1] The TB-303 was ideally suited to explore progressions of both pitch and timbre, and to explore transitions between the two - and this was the typical pattern of use in acid house and other forms of electronica. The musical context was of course quite different from what Schoenberg had envisaged. And in an examination of the psycho-acoustics of timbral manipulation, it will be shown that there cannot be a close equivalence between progressions of pitch and timbre. Timbre is "an informationally unconscious phenomenon, hazy in definition, difficult to articulate"[2] - and this was exploited by artists who used the 303 for extreme effects which musician Marshall Jefferson complained was less about creating musical moods than "disrupting thought patterns".[3]

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Andrew Bourbon: *Hit Hard Or Go Home- An Exploration of Distortion On The perceived Impact of Sound in The Context Of A Mix*

Abstract: Distortion is a powerful tool used by mix engineers to enhance the presentation of audio through enhancement of an existing sound. Distortion can take on many forms, with common distortion tools either emulating an existing hardware tool or providing new interfaces for the enhancement of audio, adding new material to manipulate the energy delivery of a chosen sound. This enhancement has the potential to not only draw attention to the listener of particular components of a sound, but also changes the fundamental delivery energy of a sound. Energy manipulation also takes place through other processing techniques including compression, which in the manipulation of the envelope of morphology of the sound may also contribute distortion subject to the wavelength of the sound being compressed, the nature of the gain reduction cell or the nature of the gain makeup amplifier. Dynamic processing will not be considered as part of this paper, instead focusing on the impact and application of distortion on the delivery of sound. In his work Zagorski-Thomas (2014) explores concepts of sonic cartoons, with his continuing work exploring the relationships between actions and energy on the perceived delivery of a sound. A range of experiments, measurements and listening examples will be presented, exploring the potential for manipulating the perceived action on a sound using distortion as the primary process. Examples from drum kit processing through to bowed stings and vocals will be processed, with a focus on exploring specific distortion footprints and application techniques. The impact of the application of distortion directly onto the sound, as a parallel to a single sound in mono and stereo, and upon multiple sounds in parallel will be measured and presented with reference to the manipulation of the perceived action of the sound.

Session 5 C

Johnny Wingstedt & Thomas Florén: *Music Producers, Knowledge and Multimodal Communication in the Recording Studio*

Abstract: This short paper presents and discusses an ongoing pilot project studying communication and collaboration between producers and singers in the recording studio. From a knowledge perspective, it is assumed that 'the formal, the informal and the tacit are embedded in and inseparable from the ongoing interaction of the participants' (Heath, Luff & Knoblauch, 2004). It is therefore necessary to, in addition to the verbal/vocal, also examine multimodal and embodied means of social interaction – such as gesture, facial expression and gaze. In this, the specific conditions established by the mediated setting of studio communication via 'talkback' systems and soundproofed glass windows are considered. Furthermore, the communicative use of artifacts, tools and technology needs to be studied, in order to get a deeper understanding of how creative and collaborative work is organized in the studio. This includes how the musical sound (live or recorded) and related technologies are used for interactional purposes besides mere artistic expression. The study of the activities in the studio is, on a micro level, being performed using multi-camera documentation and multimodal interaction analysis. On a macro level, in-depth interviews and stimulated recall sessions, focusing on the role of the producer, are used for getting the participants' perspective on how they view their own role regarding e.g. situational, institutional, strategic and knowledge-related matters. Preliminary results touch on issues concerning how power relations, agency, status and (often tacit) knowledge are negotiated. The joint workflow of collaborative and creative processes, as well as communicative resources, choices, and strategies are illuminated. The continued plan for this project is to include a larger variety of proficiency and professional levels, and musical genres. Given the increase in studies on contemporary media societies, such as consumer habits, media cultures and technologies, more research is correspondingly called for on issues concerning collaborative media production processes.

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Phillip McIntyre: *Adopting a Multimodal Research Approach to Mastering for Record Production: An Examination of the Systems Model of Creativity through Practitioner-Based Enquiry (PBE)*

Abstract: Bob Katz has asserted that mastering "is the last creative step in the audio production process, the bridge between mixing and replication" (Katz 2002, p. 11). With this declaration as a guide this paper presents the third in a series of papers on mastering for record production. The first two studies took a traditional research approach by undertaking a qualitative ethnographic study on mastering (McIntyre 2008) followed by a quantitatively based experiment on mastering (Paton & McIntyre 2009). This specific paper adopts a less traditional and more innovative methodological approach, that of practice based enquiry (PBE) (Murray & Lawrence 2000). In setting out this research this series of papers adopts a multi-modal approach to academic investigation which eschews the mono-cultural research practice of adopting a singular research position. In doing so the contribution of this paper to the series is to reveal the creative and technical practices of a record producer seeking to further his own mastering skills and at the same time documenting and analysing that creative process. This PBE approach to mastering for record production moves past traditional approaches to instigate innovative creative practice and allows for a deeper understanding of this important technical process.

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Session 6 A

Zack Moir: *IDDM (Multi-Channel Electro-Acoustic Performance For Live Saxophone and Tape)*

Abstract: IDDM is a composition which explores the condition of Type-1 diabetes and the effect it has on the daily life of those who suffer from it. Drawing on a number of streams of health data from the composer's personal diabetes management, pitch and temporal aspects of the music map to and sonically represent the near constant fluctuation of a number of aspects of this condition. Sounds sampled from diabetes paraphernalia (blood glucose meter, insulin pump, needles, etc.) are used to create a meaningful and relevant sonic environment in which the live improviser performs, responding to and trying navigate the constantly shifting harmonic and timbral landscape created by the interaction of the sonified health data. The multi-channel presentation of this work allows for the improviser and the audience to be entirely immersed in the sonic environment, thus fully representing the experience of dealing with the barrage of rapidly changing, and often confusing health data.
A blog post pertaining to the composition of this work can be found here:
http://thinkingaboutmusic.com/?p=1998
A video of the premier performance (performed in quadraphonic sound, but stereo in the video) can be found here:
https://www.youtube.com/watch?v=VvBQGGvZwkQ

Mark Durham: *Multi Channel Sound Design: Instruments for 360 Degree Composition*

Abstract: The continuing development and uptake of multi-channel audio is creating new potential for sound creators, with many current delivery formats supporting sound authored in three dimensions, for example Ambisonics in VR/AR, Auro 3D and Dolby Atmos for cinema and the home. There is also a growing interest in music composed specifically for highly spatial audio systems such as 4D Sound System, Envelop and Dolby Atmos for nightclubs. Often the focus of this technology is delivery and presentation - rather than content creation. This is reflected in the tools and process of authoring spatial audio, where typically the most common approach is to upmix: create in mono or stereo, then spatialise the content further down the line at the mixing stage. This research looks to address multi-channel content creation at its genesis, by exploring how digital instrument architectures can be designed for spatialisation, rather than being adapted to it. As part of the research a prototype device has been developed that the user can perform within a three-dimensional sound space. This terminology deliberately questions the role of performance in traditionally non-instrumental context such as mixing and spatialisation. Our approach looks towards new technology to bridge the gap between programming and performing with digital instruments in three-dimensional space, utilising motion control, gestural mapping and machine learning to interface instrument and performer with a spatial audio system. As part of a larger practice based research project, this research aims to explore how software and hardware tools shape the processes and sound palette available to sound designers, and to what extent customised software can contribute to a unique sonic signature.

Matt Barnard & James Bagshaw: *Frames to Spheres: The Abstract Spatial Paradigm of Ambisonics in a Recording and Production Context*

Abstract: Recorded popular music established its presentational conventions in the stereo age. This stereocentricity of music production and reproduction has made transitions into new spatial paradigms largely problematic

and often under-utilised. The paradigm of the 'frame' that stereo affords has become defacto, mirroring stage-centric presentation modes of music performance and informing most stages and aesthetics of production. Alongside practical themes, this paper explores a three-dimensional approach to music presentation, using the vehicle of ambisonics. The spherical domain appears, in line with our natural mode of audition, and the principle of 'channel = speaker' dissolves along with much developed spatial practice. How does this sphere function and how is it utilised? Alongside overarching ideas such as these, the speaker-agnostic characteristic of ambisonics introduces the challenge of abstract spatial definitives of works: the b-format domain of ambisonics is only realised during a decode, where the sphere is translated to the real world. As a case-study, the recording of drums is explored. The paper will address some fundamental issues of recording technique as mediated and influenced by the prospect of being played back on a multichannel set-up. With the two-channel configuration abandoned (and therefore the correlation to left and right ears), how could the drum kit be reimagined in this 3D space? How could its elements be recorded to reflect such a spherical spatialisation? And what changes to the physical configuration of the drum kit could be made to enhance such effects? And, crucially, how might such a new drum kit layout lead to new ways of playing, new grooves, new relationships between those familiar sounds? The paper will report on practical experiments and will present finished recordings.

Session 6 B

Michail Exarchos & Glenn Skinner: *Bass | The Wider Frontier: Low-end Stereo Placement for Headphone Listening*

Abstract: The placement of low end spectra in popular mixes has ranged from dogmatic centrality to extreme staging, driven by aesthetic, pragmatic and technical concerns, such as the directionality in perception, and the development of a range of playback and dissemination formats. From Phil Spector's mono obsession, to limitations enforced by radio, TV and club systems, low end content has occupied the mix's 'centre' for a vast majority of phonographic releases. On the other hand, jazz and pop records have experimented with extreme staging of ensembles, portraying real or hyper-real placements regardless of the resulting low-end speaker imbalance. However, current developments in production workflows (DAWs' preoccupation with stereo channels), the stylistic evolution of contemporary genres, and increasingly personalised modes of consumption (personal computers, smart phones and headphones) have resulted in alternative approaches to low-end creation and production, sculpting 'bass width' in innovative, if less polarised, ways. But how do producers in contemporary pop, hip-hop and electronic genres expand and 'animate' low-end content to entertain their audience and take advantage of current listening modes? What production strategies are employed to secure mixes translating effectively to a range of formats and playback technologies? And is it possible to innovate in the bass spectrum without sacrificing sensible mix architecture? The authors deploy creative practice utilising their extensive combined professional catalogue to examine the creative possibilities—and limitations—for panoramic placement of low end in the mix. Techniques range from widening pre-recorded mono bass sources via processing, to extending sampled and synthetic low-end material for the purposes of specific stylisation and contemporary modes of consumption. The aim is to investigate the aesthetic and pragmatic causality behind the phenomenon, but also to explore innovative methodologies for producing stereo bass in mixes that cater for future listening modes and formats.

Douglas Heath: *Monism vs. pluralism in record production: a comparison of contemporary heavy metal verses dub-reggae music*

Abstract: This study explores the concepts and cultural practices of monism in heavy metal and pluralism in dub reggae within a recording production context. Utilising two unique contrasting case studies, the paper explores the current reality of popular music production in practice, and applies a practice-led participant-observation approach grounded in auto-ethnography addressing the 'missing musician' concept which is a perspective absent in the literature of popular music studies (Tagg, 2011; Frabbri, 2013) and metal music studies (Pillipov, 2012). The study contrasts the two genres from both the musicians' preference and genre specific production techniques. Contemporary heavy metal music production has defining features of the genre's high commercial standard of production as heaviness and sonic weight combined with definition and intelligibility of the instrumentation involved (Mynett, 2012). Individualist and isolated recording techniques are diligently employed consistently in this genre to create this high level of production. This requires an intrinsic monistic approach from the musician's performance through isolation of recording processes. Literature around 'live-ness' (Auslander, 1998; Croft, 2007; Emmerson, 1994; Grossberg, 1993; Sanden, 2009) focuses primarily on issues concerning the translation of studio performances to the stage. Pioneers of the dub reggae genre King Tubby and Lee Scratch Perry approached the act of live dub mixing in much the same way as an instrumentalist might approach performance on a conventional instrument. 'Performance recordivity' indicates the dub genre has always had a long history within studio music in a live context with a sense of live-ness and increased audience engagement (Knowles, Hewitt, 2012). Group inclusion and pluralism within reggae culture and music lends to ideals of group performance in interactivity. These concepts of live-ness and community commonly associated with the dub genre are investigated as the influences and the preferred technique of live multi-tracking of the band in the same room with minimal over dubs.

David Brackett: *Listening to Electric Miles: Collaboration and Creativity in the Jazz Recording Studio*

Abstract: This presentation considers a case study from the archive of modern recorded jazz—Miles Davis's Jack Johnson (1971)—as a means to address the collaborative aesthetic, technical, and social dimensions of record production. The release of The Complete Jack Johnson Sessions (2003) contains a number of alternate takes and "inserts" that were cut up and spliced together to create extended tracks on several albums by Davis released from 1971 to 1974. Building upon Paul Tingen's foundational work on Davis' "electric" recordings, and drawing on recent work in popular music studies, ethnomusicology, and studies in the art of record production, I ask how this studio collaboration affects our notions of authorship and creativity in jazz. What is the relationship between the countless decisions in the studio and the sound that results? I will study studio practices and interactions in an integrated fashion, bringing together technological, practical, social, and creative/artistic components through a detailed consideration of the construction of a specific track from the album, "Yesternow." The study of this little-discussed album by a canonical artist allows us to show how a specific approach to recording, as well as changes in recording technology, can be correlated with sonic and formal differences: the complete takes and infrequent splices from Davis' early work up to In a Silent Way (1968) giving way to the additive forms of Jack Johnson compiled from open-ended sections defined by funk- and rock-based ostinati.

Session 6 C

Ingrid M. Tolstad: *Entangled musical spheres: Conceptualizing cross-cultural interactions in pop music production*

Abstract: Notions of center and periphery are well-known within the musicological discourse (see for instance Hesmondhalgh & Born 2000). However, little attention has been paid to their presence in unfolding studio production processes. How are notions of center and periphery, of mainstream and 'other', articulated and negotiated in pop musical studio production? How can we conceptualize such notions, and the ongoing interaction between them, in terms that extend beyond their immediate dichotomy? Drawing on a year of studio fieldwork, this paper explores a series of Swedish and Russian pop musical interactions in which 'the Russian' was continuously constructed as an inferior and peripheral 'musical other', characterized as 'lagging behind', having 'bad taste', and being unprofessional. In comparison, 'the Swedish' or 'Western' was considered to represent an expertise capable of producing 'up-to-date', 'cool', high quality pop music in a professional manner. Strongly related to the extent of functionality within their copyright remuneration systems, Swedes and Russians interacted based on very different understandings of how music is financed, produced, organized, distributed, consumed and profited from. These discrepancies played out not only as disagreements and discussions about what kinds of resources should be put into what kinds of music making activities, but was also fundamentally intertwined with evaluations and priorities made concerning sonic and musical features. Distinctions made between center and periphery thus became entangled with notions and perceptions of aesthetic quality, professionalism and modernity. Drawing on traditional anthropological notions of economic spheres (Barth 1981, Bohannan & Bohannan 1968), these two Swedish and Russian pop musical entanglements are here conceptualized as a form of musical spheres (Tolstad 2016), representing systematically divergent paths of circulation, perceptions of aesthetic value, and practices in the making of pop music. The paper also shows how the dynamic character of this concept makes it transferable to other musical contexts.

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Dana Devlieger: *"Pullin' Out of Here to Win:" The Changing Narrative of "Thunder Road"*

Abstract: This paper examines three versions of Bruce Springsteen's "Thunder Road," all recorded in 1975: an early live performance in February, the studio recording released in August, and a later live performance in October. Building on Zbikowski's work on conceptual blending in German lied, I argue that conceptual blending can influence the listener's understanding of narrative because musical choices can clarify lyric ambiguities through blends. I also assert that blends found in popular music are clearer than those of classical music because the primary text (the recording) is the same every time it is played. However, "Thunder Road" highlights an interesting issue present in popular music: the artist can continue to revise his arrangement of a song in live performances, drastically altering the song's narrative. Springsteen's alterations to the song's music and lyrics during 1975 create three distinct protagonists, each negotiating their own relationship to the desire to escape from small town life. In the earliest recording, the protagonist comes off as young and restless, fueled more by boredom than desperation. The studio recording tells the story of a desperate you man seeking to escape from unpleasant circumstances. Finally, the later recording depicts a much older man who wants to escape but knows that he cannot. This paper investigates the different features of each recording that contribute to these altered narratives.

Lachlan Goold & Phil Graham: *The uncertain future of the Large-Format recording studio*

Abstract: This paper is an investigation of new approaches to music production that have emerged over the past thirty years and greatly accelerated over the past decade. The changes have primarily been facilitated by the proliferation of low cost digital music production tools. A secondary trigger has been the subsequent decline in recording budgets concomitant with the decline of revenues for recorded music (Burgess, 2008, p. 1). The confluence of these issues has meant large-format recording studio processes are giving way to lower cost "desktop", "bedroom", or "DIY" music production processes (Bennett, 2012, p. 8; Théberge, 2012, pp. 89-90). Little attention has been focused on evaluating and understanding the outcomes of these new technologies from perceptual, actual, and aesthetic perspectives specifically as they pertain to the meaning of the term "recording studio" as a particular kind of space. This paper seeks to address this gap in understanding through evaluations of a comparative set of recordings completed in disparate scenarios. It compares processes of recording in large-format recording studios with those associated with situations dictated by a set of limitations common to smaller budget "DIY" projects, and with those involved with a hybrid approach combining both methods. As part of a PhD project, research methods include participant interviews, participant observation, peer review of the material produced, and analysis of attitudes towards creative labour under these different circumstances. This paper will focus on the peer review of the material produced by seven highly regarded producers which indicates that while different recording spaces present different advantages and disadvantages, in terms of recording quality, the large-format recording studio appears to present no major technical or aesthetic advantage over DIY environments in terms of recording outcomes. Given the proliferation of DIY approaches to recording, this topic has important ramifications across the music and recording industries and brings into question the viability of the large-format recording space.

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Session 7 A

Yngvar Kjus: *Producing consumption: Facilitating musical immersion across online and offline media*

Abstract: This paper examines the facilitation of music experience and immersion across live and recorded music formats. These two forms of music delivery (and their intersection) are often evaluated from an economic macro-perspective. Live music has been regarded as advertising for records, and upheavals from digital distribution in recent years have therefore been seen as a reversal of this effect. The relationship between the two domains has barely been approached in terms of the efforts of concert organisers and music distributors to enable communication between artists and their audiences. This paper reveals how digital media can be used to bridge artists' concerts and the growing recorded archives of new online music services, thereby facilitating novel music experiences. It identifies evolving practices through which live-music organisers tap into online music archives to contextualise performances, and online music services bring their archives to life through interactions with concerts and festivals. Case studies involve the Norwegian streaming service WiMP/Tidal and the Øya festival and include several interviews with key personnel as well as music consumption statistics. The paper studies the efforts and techniques of these intermediaries towards (re)gaining the trust of artists and audiences. In doing so, it explores the analytical potential of the psychological terminology of mentalization, which is, in short, the capacity to imagine and respond to what others are thinking and feeling. These processes affect the ways in which new technology is used to integrate and enhance social and psychological experiences of music. The paper assesses the power of live and recorded music intermediaries over how people receive, experience and immerse into music, considering, among other things, the new intersections between the curatorial work conducted by humans and the guidance offered by machines and algorithms of digital music archives.

Jason Woolley: *The cultural politics of using technology to support the aesthetic in Jazz record production*

Abstract: In the pursuit of the aesthetic, producers and artists are able to utilise technology to create and process recordings, and in doing so, shape the presentation of the performances contained within the recordings. We might consider the application of studio techniques in order to produce the recordings, as 'studio interventions'. Ethical acceptance on the extent the technology of studio intervention can be applied can vary between artist, listeners and genres. Taylor argues that the goal of Rock production is to achieve the best aesthetic by utilising the '…manipulation of electronic sound…in order to get the best final result' (Taylor in Jago 2013). Consider also the countless main stream pop releases where it is acceptable and even stylistic for the vocal line to be audibly supported by pitch correction processing. A genre where complex interactions and tensions exist between the affordances technology might offer the aesthetic, and which studio interventions are culturally acceptable to the artist and listener, is Jazz. This is perhaps because at the stylistic and cultural core of Jazz, both artist and listener seek the authentic 'ephemeral interaction' of the music, and anything other than this might be considered 'dishonest'

(Jago 2013). Further to this is the case of Free Jazz, where for some, the use of technology to shape the recording of an improvised performance means the 'freeness' succumbs to the dominant ideology of the production context (Corbett in Gabbard 1995). This paper discusses the attitudes contemporary Jazz musicians have toward the use of technology and the thresholds of studio intervention they are willing to cross in order to achieve their aesthetic. The discussion draws upon personal experiences of mainly Free Jazz production, and also the returns of surveyed Jazz musicians, who were polled on the subject of the use of technology in the production of 'Straight-ahead' Jazz and Free Jazz records.

Martin Koszolko: *The Tactile Evolution — Mobile Electronic Music Production and Digital Affordances of Apps*

Abstract: A growing trend among the community of music producers is a return to the tactile experience of music creation tools and a focus on hardware that reduces the reliance on desktop systems. In this paper, grounded in my music production practice, I investigate the various affordances of mobile music technologies in the field of electronic music production. I examine a selection of iOS music apps as well as hardware and highlight affordances concerning production, performance, improvisation, portability and music theory. I also consider how mobile producers relate to the concept of studio space in the context of portable technologies. The producers discussed here undertake multiple roles reflected in Burgess's understanding of a producer as an auteur, a self-produced artist leading the creative process (2013). The different feel and tangibility of mobile technologies impact upon the way producers choose to engage with particular formats. This paper explores an area of the contemporary digital lanscape that is significantly changing the creative practice of music producers around the world. My analysis shows that many iOS music production apps as well as mobile music making hardware offer new ways of musical expression. Such tools enable a tactile approach to music performance and facilitate experimentation, and offer significant advantages over other existing technologies. Drawing on notions of portability and performativity, I consider how contemporary technologies have generated renewed approaches to electronic music production and performance. I conclude by suggesting that portable technologies allow new ways of interaction, music composition and playability, which empower producers to redefine their methods of music creation.

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Session 7 B

David Ward Francis: *A Creep Climbing Up the Walls: The Dynamic Timbre of Rebellion, Angst, and Escapism in Radiohead*

Abstract: Albin Zak, in The Poetics of Rock, argues that amplified attention and control to timbre developed a poetic timbral language with timbral tropes between specific techniques and meanings. One such troped timbral mannerism is rock's connection of distortion to rebellion. In recent years, improvements in recording technology enabled effective contrasts between distortion and clean timbres. Radiohead dynamizes this trope and moves sonic events through coordinated continuums of brightness and aggression. Reducing timbral qualities and proposing potential meanings remain problematic. Harris Berger, Cirro Scotto, and Robert Walser provide definitions of distortion and examine the relationships between distortion and ideologies in several sub-genres, yet, restrict the definition to production techniques. Based on David Huron's approach to timbre, this paper advocates reducing timbral dimensions to three perceptually relevant dimensions of spectral centroid, balance, and aggression, plotting sounds and sound aggregates through a non-sequential space—Relative Timbral Space. This space combines technological and acoustic sonic origins into one space—allowing for acoustic distortion generation—and provides mappable space for meaning. Eric Clarke's ecological listening analysis (refined by Brad Osborn and Mark Slater) enables metaphorical interpretation of resulting timbral relationships. Radiohead's 1993 single, "Creep," "Feral" (2011), and "Climbing Up the Walls" (1997) each make use of distortion, but modify the trope to affect meaning. RT-space is used to compare timbral relationships, finding subtle differences between each. Using ecological listening, timbral differences are found to contain cogent metaphorical statements. Small enclaves of contrasting bright timbres invoke angst. If that enclave increases in volume against the contrasting timbres, escapism is invoked. "Climbing" is found to form the most cogent metaphorical statement, encapsulating Radiohead's transition to a new sound identity found in Kid A (2000).

Alex Stevenson: *Digital aesthetics in contemporary popular music performance*

Abstract: The introduction of digital sampling technology enabled electronic music producers to manipulate existing musical performances to achieve complex grooves that would have been significantly challenging, if not impossible for musicians to perform live. In hip hop, micro-rhythmic gestures created genre-specific grooves which, as discussed by D'Errico (2011), formed a significant component in the creation of sonic signatures for many influential hip hop producers. In drum'n'bass, samples of funk breakbeats were subjected to increases in both pitch and tempo, which along with the fragmentation and rearrangement of components of the sample,

created complex rhythmic performances with timbral variations and characteristics far removed from those captured in the original recording of the drummer's performance. Furthermore, in many experimental electronic music styles, as part of what Cascone refers to as a '"post digital" aesthetic' (2000, p. 13), digital artefacts and failures became defining musical characteristics. The glitches of digital playback failure and what Brøvig-Hannsen & Danielsen refer to as 'digital silence' (2016) provide examples of digital characteristics that have become common place in contemporary popular music production. As a result of this, many contemporary popular musicians face the challenge of incorporating these musical characteristics performance practice. These musicians have therefor had to develop innovative performance techniques which allow them to (re)create these musical characteristics which conforms to a digital aesthetic, often without the use of digital technology. Drawing on the work of authors such as Keil (1995), Danielsen (2006; 2013) and Oliver (2015) utilising rhythmical and timbral analysis of musical works, this paper explores the impact of digital aesthetics on contemporary popular musicians and explores the ways in which the emerging techniques and practices can be better understood within popular music discourse.

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Méi-Ra St-Laurent: *« It's kind of in the middle » The "mid-fi" aesthetic: toward a new designation of black metal aesthetic of recording. The case of the Quebec's black metal scene*

Abstract:
Since its advent in Norway in the late 1980s, black metal music is referred to a "lo-fi" sound aesthetic. For black metal fans and musicians, this designation not only allowed to define the type of sonority used, but also to measure the level of "authenticity" of a group. Indeed, a black metal band which used a lo-fi sound esthetic was considered to have a sincerer artistic approach than a black metal band using a hi-fi aesthetic. However, this designation has become problematic. Indeed, as early as the mid-1990s, many black metal bands moved gradually away from this lo-fi sound, but without embracing the hi-fi sound aesthetic, which would be considered as a betrayal of black metal's principles (Reyes 2013). Moreover, several groups of contemporary black metal do not necessarily seek to imitate the sound aesthetic of the first black metal bands and will instead seek to reproduce a sound "in the middle", between lo-fi and hi-fi. However, academics working in the black metal milieu continue to designate the black metal sound as "lo-fi", without necessarily taking into account the gradual change of sound aesthetics characterizing these groups. In this paper, I will be interested in this phenomenon by first defining what is a lo-fi aesthetic in the context of black metal, based on the definition of Kromhout (2009). Then, I will be interested in the evolution of this aesthetic by using different sound examples. Finally, I will explain concretely how contemporary black metal bands are considering their own sound aesthetics based on ethnographic data I have collected during different interviews I realized in 2016 with the black metal scene in Quebec. This will finally lead me to propose a new terminology allowing to better qualify the sonority of many contemporary black metal bands, that is the "mid-fi" aesthetic.

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Session 7 C

Jason Fick: *Why Study Music Production at a University?: The Benefits of a Multidisciplinary Approach to Enhance Student Learning and Career Preparation*

Abstract: Learning the craft of music production is traditionally grounded in practical, hands-on experiences, and a college degree is not often necessary to obtain an entry-level position in the industry. Despite this fact there has been a steady increase in music production-related degree programs at higher education institutions worldwide in recent decades. If this is an area that does not require a degree to be successful, why should anyone consider pursuing it as a course of study at a university? What information can be learned in higher education that cannot through on-the-job experience? This paper will discuss the benefits of a multidisciplinary approach to music production pedagogy that hinges on the intersection of science and liberal arts curricula. With a limited amount of specialized, entry-level positions in the industry, the music production professional of today must function as an audio expert capable of a vast range of skills. Enrolling in a program with an integrated, multidisciplinary curriculum can empower students with versatile skills that en-

courage connections between their immediate specialty and other areas, including the liberal arts and sciences. My teaching approaches balance hands-on, real-world scenarios with reflective writing and discussion, research and experimentation, and multi-disciplinary collaboration. This provides students opportunities to build critical thinking, analytical, communication, group work, and problem solving skills, all of which are basic competencies that current research proves lacking among new hires. Furthermore, university students have the opportunity to broaden their methods and application beyond their discipline through the general core curriculum. With these concerns in mind, I will discuss building a program at Oregon State University that aims to develop well-rounded individuals exposed to a variety of creative, technical, and multidisciplinary approaches to the field of music production.

Carlos Caballero: *The forms of recording and sound aesthetic of tropical and urban music in Colombia. A parallel between music production of the 60´s and 70´s and the contemporary sound*

Abstract: Medellín was the epicenter of Colombia´s music and record production between the middle of the 50´s and the end of the 90´s. Such production boom came with the so-called "paisa" sound, characterized by youthful and irreverent groups that mixed rock and traditional rhythms of the Atlantic coast, specifically between the 60´s and 70´s. In this period, a musical and social sound revolution was developed revolving around not only music but a universal sense of transformation. That era was characterized by common elements around activities related to record production, which marked a particular sound aesthetic given not only by the technological scope of the recording equipment of the time, but by the social characteristics that allowed a Third World country to position a sound that would transcend its borders and would carry to all the world its artistic manifestations by means of its most recognized groups of tropical music. At present, the sound aesthetic of music generated from this epicenter has similar ingredients that influence its results, both from the technological and social point of view, but certainly with very different aesthetic meanings. However, the cultural phenomenon is very similar, based on irreverent young people making music that is internationally accepted as an innovative commercial element (and to which popular artists of commercial success have been added), but that for traditional artists, folklorists, musicians and cultural investigators generates more animosity than admiration. Taking this into account, we can ask: Is it possible to make a cultural parallel between the phenomenon of Medellin's tropical urban music in the 60´s and 70´s with the current phenomenon of urban music? How much did technology influence the final aesthetic result? What perception did the society of such era have of these artists, and what perception does it have now? Is it possible to establish similarities?

Phillip McIntyre & Paul Thompson: *Tradition and Innovation as Complementary Pairs in the Creation of a Body of Recorded Work: The Beatles Journey from Mono through to Stereo*

Abstract: Systems are characterised by emergence, scalability, interdependence, networks, nonlinearity and complementarity (McIntyre et.al. 2016, p. 15). It is the last of these, complementarity, that this paper examines. While polar oppositions typify most human communication they depend on and complement each other for existence. As Negus and Pickering indicate in their book Communication, Creativity and Cultural Value (2004), it is "a common misconception to regard innovation and traditions as diametrically opposed to each other" (2004, p.91). They suggest that "rather than seeing them as deeply divided, we want to consider tradition and innovative forms and practices as informing and supporting each other. It is only by thinking about their interrelationship that we can understand processes of creativity and cultural change" (ibid). To put this another way, "'new' is meaningful only in reference to the 'old'. Original thought does not exist in a vacuum. It must operate on a set of already existing objects, rules, representations or notions" (Csikszentmihalyi 1999, p.315). In the light of these ideas this paper will examine the historical development of the creative practices of the Beatles' recorded oeuvre. The Beatles growth across their brief recorded history moved from what is now seen as an anachronistic medium, mono, to what was then seen as an innovative format, stereo. They absorbed the lessons of using a relatively traditional process to establish a novel and valued creative output.

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Session 8 A

Amy Blier-Carruthers: *The Influence of Technology on Performance - Classical Perspectives*

Abstract: What effect does recording have on the performances that are captured, and the performers that are being recorded? It is an oft-repeated axiom that studio recordings are not the same thing as live performances, and this has been discussed from a largely theoretical standpoint, but comparatively little research has been undertaken into what actually happens behind the often closed doors of a classical recording studio. In order to begin to understand the influence of recording technology on performance, it would help to first consider some questions: What changes do classical musicians have to make, consciously and unconsciously, to produce a performance suitable for recording? Is the technology driving the aesthetic choices, or is it at the service of those

aesthetic concerns? How do the accepted working practices affect the artistic output? How can musicians and production teams use the tools of the recording studio to their creative advantage? This paper will explore these questions, and offer a brief selection of case-studies, which cover examples which fit under the headings of 'Mono', 'Stereo' and 'Multi'. These range from an analysis of how details of performance vary between the live concert and the studio recording (illustrated by rarely-heard sound examples from the Sir Charles Mackerras Collection of recordings), through a recent experiment in which modern musicians have experienced the effects of recording onto wax using early-20th -century acoustic recording techniques, to current experiments in the 'hyper-production' of classical repertoire. It will conclude with examples of some recent and forthcoming attempts at using more progressive technological tools and working practices in classical music recording, and a consideration of new developing strategies for the training of conservatoire students to prepare them for the effects of recording in order to enable them to work creatively and collaboratively in the recording studio.

Hans Lindetorp: *Multiraction - An interactive musical experience in a multi dimensional audio environment*

Abstract: This demonstration presents the result of a research project aiming to discover new possibilities for interactive live music productions using cutting edge web audio technology. In the presentation the audience is invited to interact using their smartphones through which different layers and aspects of the music can be controlled. The music is pre-composed and produced in a non-linear fashion to be responsive to the inputs from the audience. Lots of audio clips are finally synchronized in real time and routed through a multi-channel speaker system. The project has been running for three years as an iterative process of software development and student productions where artistic visions has been an on-going driving factor for further software development. The result is a new web based musical framework, new strategies for productions and new courses at Royal College of Music where traditional music producers are introduced to the challenges of making interactive music. The technical foundation for the framework is Web Audio API, nodejs and socket.io and the project relates very well to the latest's research from CoSiMa (a research project at Ircam, Paris). The study has led to important insights regarding still unsolved problems for music integration in interactive environments. One important aspect is the relation between the artistic freedom for composers on one hand and the technological limitations on the other. Another aspect is the dynamic and flexible time in a live musical performance and the need for rigidly quantized audio files in a loop-based, interactive environment. In the demonstration, the audience will be presented by solutions to some of the challenges and immersed by music where new questions arise: Who is the music producer? What is an audience? Is there an artist?

Simon Zagorski-Thomas: *Looney Tunes: Sonic Cartoons and Semantic Audio*

Abstract: The idea of sonic cartoons (Zagorski-Thomas 2014) is built on a theoretical model drawn from the ecological approach to perception (Gibson 1979) and embodied cognition (Feldman 2006, Lakoff & Johnson 2003). The presentation will begin with a brief explanation of how the neuroscience of mirror systems and this theoretical model can lead us to an understanding of recorded sounds in terms of activity performed by one or more human and/or non-human agents in an environment. A non-human agent is an object which has either been physically designed and built or found and re-purposed by a human agent and, thus, embodies their agency in some way. In addition, in much the same way that our understanding of abstract visual art is based on 'what it is not', multi-track and electronic music can be interpreted as something impossible and yet understandable. Based on an on-going series of experiments, this project seeks to identify a range of sonic invariant properties relating to types of activity, the levels of energy expenditure involved, types of human agent, types of non-human agents and types of environment. While these relate to a broader musicological research project, they also provide a framework for exploring processing that is based on semantic audio. Thus, for example, if a range of invariant properties can be systematically identified that relate to:
• the size of a drum; • the way it is tuned
• the physical properties of the skin, the shell and the beater; • the energy and shape of the sounding gesture;
• the size, shape and material construction of the space
• the orientation and proximity of the listener to the sounding object and the various ways these things interact with each other, this opens up the possibility of designing semantic audio-based plug-ins that approach shaping and creating sound from a variety of new perspectives.

Session 8 B

Alan Williams: *Setting the Stage: Surround Sound Auteurs and the Fragmenting of Genre*

Abstract: Multi-channel sonic experience is derived from a myriad of technological processes, shaped by market forces, configured by creative decision makers and translated through audience taste preferences. From the failed launch of quadrophonic sound in the 1970s, through the currently limited yet sustained niche market for 5.1 music releases, a select number of mix engineers and producers established paradigms for defining expanded sound stages. Whereas stereophonic mix practices in popular music became ever more codified during the 1970s, the relative paucity of multi-channel releases has preserved the individual sonic fingerprint of mixers working in surround sound. Moreover, market forces have constricted their work to musical genres that appeal to the audiophile community that supports the format. Building upon the work of Moylan, Théberge, Sterne and

others, this study examines the work of Elliot Scheiner, Bob Clearmountain, Dave Fridmann, Steven Wilson and Giles Martin to not only analyze the sonic signatures of their mixes, but to address how their conceptions of the soundstage become associated with specific genres, and serve to establish micro-genres of their own.

Andrew Bourbon & Daniel Pratt: *Existing In Between Phase*

Abstract: This paper examines the phase interaction of multi-microphone recording and mixing. Its intent is to develop an in depth understanding of relationships 'in between phase' in order to produce better recorded text. For any student studying recording and mixing, phase is a subject that is often discussed. It is used in technical descriptions relating to the acoustic and electronic summation of multiple sources and is explained in practical recording workshops. One of the conceptual challenges that students face is hearing phase variance and implementing the appropriate action to remedy what they hear. For educators, explaining phase becomes problematic when that variance represents a shift that cannot be solved via a simple polarity reversal. We explore the use of metering and phase manipulation in the recording and mixing of audio. On the recording side, we investigate through the creation of a drum recording documentary. The documentary examines the capture of phase interaction information, the analysis, and correction of resulting issues. The data analysis of the phase relationships will inform both analog processing choices and the physical movement of microphones. We demonstrate real time phase interaction measurement using the innovative metering in the Sound Radix Auto Align plugin. This information helps us to demystify phase interaction and enables us to develop new methods for microphone placement. We then manipulate the complex phase relationships in a Big Band recording featuring thirty two microphones across twenty sources using a range of mono and stereo techniques. We use metering and analysis techniques to inform our alignment and manipulation of this pre recorded work. In both of these case studies the sonic impact of the phase analysis and manipulation will be presented. The data will be used as a pedagogical tool for the demystification of phase in the teaching environment.

Shara Rambarran: *'The Ghost Inside': Exploring the aesthetic retro sounds and vintage production in the works of the producer, Danger Mouse*

Abstract: Brian Burton, better known as Danger Mouse, notably recognized as a hip hop music producer, has become a demanding figure in the music industry and has worked with the likes of Damon Albarn/Gorillaz, A$AP Rocky and Beck. Ever since his controversial mash up, The Grey Album (2004), Burton has occasionally sidelined his musical roots as a hip hop producer to focus on his trademark sound. While genre-blending is still evident in his productions, there are elements used in his works that has shaped Burton's individuality as an auteur and producer. He has achieved this by applying retro sounds in his music through the use of vintage instrumentation and production. This paper examines the inclusion of retro sounds in music resulting from the use of vintage instrumentation and production. Based on Schaeffer's concept of 'reduced listening' (1966), the paper argues that the sounds are not heard for ornamental pleasure, but for cathartic experience displayed by musical signs from the 1960s/70s that are covertly transformed into haunting sonics. The analysis of these retro signifiers are approached by: understanding its socio-cultural context with reference to Derrida's hauntology (1993); and, aesthetically exploring the affect and effect of the sounds that are produced. Arguably, it is the musicians who contribute in recreating the sounds by playing the instruments in the studio. It is also however, the placing of the vintage instruments in its recording space, use of technology, and overall production that captures and finalizes the retro signifiers in sounds, and therefore allows Burton to revisit this arrangement in other projects. The paper explores this by referring to Grandaddy, Michael Kiwanuka and Red Hot Chili Peppers as case studies, and argues that the recordings demonstrate Burton's fixation in bringing past sounds to the present resulting in a retro-futuristic and multi-audio experience for the listener.

Session 8 C

Carl Flattery: *Memory and Place in Songwriting and Production: The work of Hannah Peel*

Abstract: Hannah Peel is a singer-songwriter, multi-instrumentalist, composer and arranger who's work continually reflects the themes of memory and place through the lyrics, arrangements and production. Her most recent solo album 'Awake But Always Dreaming' (Peel, 2016) was written in response to her Grandmother's dementia. After seeing the effects of music on her Grandmother, how connections are made through sharing musical experiences, she was inspired to write the album. She linked up with a research project into dementia and used the scientific research to inform the main themes of the album combined with her own personal response to her relationship with her grandmother. The idea of memory and place can be observed throughout Hannah's career. In the two albums made as part of the collective The Magnetic North, conveying memory and place is the central ambition, being autobiographical and linking into ideas of Psychogeography. The first album 'Orkney: Symphony of the Magnetic North' (The Magnetic North, 2012) focused on the legends surrounding Orkney, which is the birthplace of lead singer Erland Cooper. The second album, 'Prospect of Skelmersdale' (The Magnetic North, 2016), would prove to be a more unlikely theme, looking at the new town of Skelmersdale, where the band's guitarist Simon Tong had spent his teenage years. Within these albums, memory and place is communicated through the lyrics, arrangements and additional sound effects and archive voice recordings. In Hannah's 'Rebox' projects, memory, though less intentional, maybe more subliminal, is a key trait of the composition and

arrangements. Her use of a music box to reinterpret her favourite pop songs conjures up feelings of childhood. Her project, 'Mary Casio', is a collaboration with a colliery brass brand with Hannah performing 70's analogue synths and telling the story of 86 year old Mary Casio, based in the mining town of Barnsley.

David Thyrén: *Searching for Sophia in Music Production Education – Dag Volle as an example of indifference, individual skills and special knowledge in Swedish record production*

Abstract: In the project Searching for Sophia in Music Production Education, a team of researchers from the Royal College of Music, study various formal and informal learning processes connected to education in music production in higher education. This paper is part of that project. Previous research shows a variety of competences that are used and needed among musicians, music producers and others active in the art of music production. Our interest has a background in the worldwide export of music from the Nordic countries. Several of the Nordic international successful songwriters, musicians and music producers have more of an informal background than a scholastic formal education. In this paper, I focus on the Swedish record producer Dag Volle [Denniz Pop] (1963-1998). Volle enjoyed international success in the 1990´s, recording and producing e.g. Ace of Base, Backstreet Boys and Michael Jackson. Volle was also the mentor of Max Martin. Volle was not a trained musician, he couldn´t read music and had no formal knowledge of music theory. He started his career as a DJ in the 1980´s and ended up as one the world´s most successful record producers, before his untimely death in 1998. The results indicate that Volle was a creative person, almost childish in a way. He was driven by his love of music. Volle felt slightly inferior for not being able to read music but didn´t let it affect his working ethos. He worked very long hours in the studio, often under pressure, but managed to have fun all the same. Volle had great intuition and didn´t hesitate to make fast decisions that initially seemed risky but later paid off in an unlikely way.

Simon Sjöstedt, Felix Brag, Sophie Verdonk, Erik Petersson & Ludvig Klint: *An analysis of creativity aspects in songwriting books*

Abstract: This study shows how different aspects of creativity are expressed in current literature about songwriting. The study includes twelve recently published handbooks that were selected after a search on online bookshops with songwriting and synonymous terms as keywords. Knowledge-critical analysis was used to study who the authors of these books are, who the recipients of the books are expected to be and how concepts of creativity are mentioned and used in the texts. Although the analysis shows that there are major differences between the analysed books, all authors, who all have extensive professional experience from the music industry, uses words like "gut feeling" or similar expressions to describe what primarily is needed to develop creativity and success within the field of songwriting. Craftsmanship, the importance of workflow and persistence combined with hard work that will pay off in the form of acquired knowledge and the ability to be creative when inspiration strikes, are also perceptions that clearly appear in the analysed literature. There is a lot of variation in the content and the layout of the different analysed books. This can mainly be explained by the fact that the handbooks are written for different audiences but also that the authors have different industry backgrounds. One possible shortcoming in the analysed literature is that the contemporary integration of music production and songwriting, as described in other current literature on record production, is not addressed in the extent that would be reasonable to reflect the music production industry of today. This study will be followed up by three new sub studies. Firstly an analysis of current hits where theories from the analysed songwriting books are used, secondly a production study based on the same theory and thirdly, a follow-up analysis of similar digital books and other online teaching materials.

Hans Gardemar & Jan-Olof Gullö: *Artists, musicians and music producers: Same but different?*

Abstract: The purpose of this project is to analyse core characteristics of key players in the music industry: artists, musicians, music producers and others. The background of the project is the growing interest among students to study popular music and music production in Scandinavian higher education Their interest can partly be explained by the successful music exports from the Nordic countries. A clear problem for the universities is that many of the students who are interested in various kinds of music related education often much more would prefer an artist career than to become a trained musician or music teacher. At the same time, very little of the training offered, in higher education, is focused on developing talents into full-fledged artists. Therefore, there is a gap between what is offered and what many students desire. Another problem is that many of the teachers in higher music education often have very limited experience as artists, but often have a good and extensive experience as musicians. Therefore, students in higher music education perhaps develop musician skills to a far greater degree than artist skills. A similar problem can be found in music producer education, where many of those who teach may have extensive experience as sound engineers rather than as producers. In order to create knowledge about this problems and to develop the higher education in music, this project collects multifaceted data through interviews with key players in the music industry: artists, musicians, music producers and others as well as by and analyses of their activities. It is an on-going project and at the conference in December, our objective is to present selected results from the study.